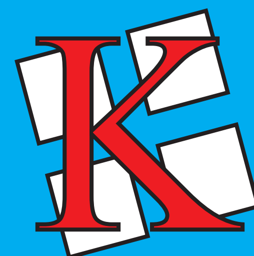

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ZNAČAJ KOLOREKTALNOG KARCINOMA U OBOLEVANJU I UMIRANJU ODRASLOG STANOVNIŠTVA JUŽNOBANATSKOG OKRUGA U PERIODU OD 2010. DO 2019. GODINE

Aleksandra Perović[1], Jasmina Pavlović Stojanović[1], Ljiljana Lazić[1], Dragana Antonijević Đorđević[1], Magdalena Bjelica[1], Ivana Popov[1], Veronika Popovski[1]

[1]Zavod za javno zdravlje Pančevo, Srbija

SAŽETAK

Uvod/cilj: Prema podacima GLOBOCAN-a, kolorektalni karcinom (KRK) u svetu predstavlja veliki javno zdravstveni problem, jer je 2018. godine registrovano 1.849.518 novoobolelih i 880.792 umrlih. U Srbiji KRK je drugi vodeći uzrok obolevanja kod muškaraca (iza karcinoma pluća), a treći kod žena (iza karcinoma dojke i pluća). Cilj rada je da se kod odraslih analizira kretanje vanbolničkog obolevanja, stope hospitalizacije i mortaliteta od KRK u Južnobanatskom okrugu u periodu 2010-2019. godine.
Metode: Primenjen je deskriptivni statistički metod rada. Podaci iz rutinske zdravstvene statistike analizirani su za period 2010-2019. godine. Praćeni su pokazatelji vanbolničkog obolevanja, bolničkog lečenja i umiranja od KRK odraslog stanovništva Južnobanatskog okruga.
Rezultati: U Južnobanatskom okrugu dolazi do porasta vanbolničkog obolevanja, kao i stopa hospitalizacije od KRK. Na godišnjem nivou je zbog KRK u bolnicama Vršac i Pančevo hospitalizovano 214 pacijenata. Prosečna starost je iznosila 66,8 godina, a prosečna dužina lečenja 8,4 dana. Najviše hospitalizovanih je starosti od 60 do 69 godina. U obe bolnice se beleži viša stopa hospitalizacije kod muškaraca nego kod žena. Oko 110 ljudi godišnje u okrugu izgubi život zbog KRK, a prosečna starost umrlih je 75,7 godina. Najviše umrlih muškaraca je starosti od 70 do 79 godina (32,7%), a više od 80 godina kod žena (31,8%). Među vodećim uzrocima umiranja kod muškaraca je KRK na devetom, a kod žena na trinaestom mestu, a stopa mortaliteta je viša kod muškaraca nego žena.
Zaključak: Zbog značajnog učešća u obolevanju i umiranju, KRK predstavlja veliki zdravstveni problem stanovništva Južnobanatskog okruga. U cilju unapređenja zdravlja stanovništva neophodno je sprovoditi organizovani skrining u cilju ranog otkrivanja KRK u ciljanoj populaciji, a intenzivnijom promocijom zdravlja i zdravih stilova života redukovati izloženost faktorima koji se dovode u vezu sa KRK.

Ključne reči: kolorektalni karcinom, oboljevanje, umiranje, Južnobanatski okrug

Uvod

Kolorektalni karcinom (KRK) u razvijenom svetu predstavlja veliki zdravstveni problem zbog visoke incidencije i mortaliteta. Rastuće znanje o karakteristikama ovog karcinoma (po pitanju genetike, molekularne biologije i faktora rizika), kao i intenzivan rad na unapređenju prevencije, dijagnostike i hirurških tehnika, doveli su do poboljšanja ukupnog preživljavanja, ali je ono i dalje nezadovoljavajuće.

Rizik od razvoja ovog tumora zavisi od godina starosti i, prema podacima iz literature, počinje da raste nakon četrdesetih, sa značajnim porastom između 50. i 55. godine života. Sa svakom daljom dekadom života, rizik od oboljevanja se udvostručuje (1). Sva lica starija od 50 godina nose 4,8% rizika da će do 74 godine života imati karcinom debelog creva, odnosno 2,3% rizika da će umreti zbog posledica ove bolesti (2).

U Srbiji, prema podacima GLOBOCAN-a za 2018. godinu, broj novoobolelih od KRK u populaciji muškaraca je iznosio 3.775, a u populaciji žena 2.374 (3). Standardizovana stopa incidencije (na 100.000) za KRK je bila 36,7 za celokupnu populaciju, 49,0 za muškarce i 26,4

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THE SIGNIFICANCE OF COLORECTAL CANCER IN THE MORBIDITY AND MORTALITY OF THE ADULT POPULATION OF THE SOUTH BANAT DISTRICT IN THE PERIOD FROM 2010 TO 2019

Aleksandra Perovic[1], Jasmina Pavlovic Stojanovic[1], Ljiljana Lazic[1], Dragana Antonijevic Djordjevic[1], Magdalena Bjelica[1], Ivana Popov[1], Veronika Popovski[1]

[1] Institute for Public Health Pancevo, Serbia

SUMMARY

Introduction/Aim: According to the GLOBOCAN data, colorectal cancer (CRC) is a major public health problem in the world, because in 2018, 1,849,518 new cases and 880,792 deaths were registered. In Serbia, CRC is the second leading cause of the occurrence of disease in men (after lung cancer), and the third in women (after breast and lung cancer). The aim of this paper is to analyze the trends of outpatient morbidity, hospitalization and death from CRC in the South Banat District in the period 2010-2019.
Methods: A descriptive statistical method was used. Data from routine health statistics were analyzed for the period 2010-2019. The indicators of outpatient illness, hospital treatment and death from CRC of the adult population of the South Banat District were monitored.
Results: Outpatient and inpatient morbidity rates from CRC in the South Banat District are on the rise. At the annual level, 214 patients were hospitalized in the hospitals Vršac and Pančevo due to CRC. The average age was 66.8 years and the average length of treatment was 8.4 days. Most of the hospitalized people were aged between 60 and 69. Both hospitals had a higher hospitalization rate for men than for women. About 110 people a year in the district lose their lives due to CRC, and the average age of people who died is 75.7 years. The majority of men who died were aged between 70 and 79 (32.7%), while women were aged 80 and more (31.8%). Among the leading causes of death in men, CRC is in the ninth place, while in women in the thirteenth place, and the mortality rate is higher in males.
Conclusion: Due to its significant participation in the occurrence of disease and death, CRC represents a major health problem in the population of the South Banat District. In order to improve the health of the population, it is necessary to conduct organized screening for the early detection of CRC in the target population, with more intensive promotion of health and healthy lifestyles to reduce exposure to factors associated with CRC.

Key words: colorectal cancer, morbidity, mortality, South Banat District

Introduction

Colorectal cancer (CRC) is a major health problem in the developed world due to the high incidence and mortality. Growing knowledge about the characteristics of this cancer (in relation to genetics, molecular biology, and risk factors), as well as the intensive work on the improvement of prevention, diagnostics, and surgical techniques, have brought to the improvement of survival, but it is still unsatisfactory.

The risk of developing this cancer depends on age and according to the data from literature, it starts to grow after forties, with the significant increase between 50 and 55 years. The risk of the occurrence of this disease is doubled with the every new decade in life (1). All persons older than 50 years have a 4.8% chance of developing colorectal cancer until they get 74, that is, a 2.3% risk of dying from this disease (2).

In Serbia, according to the GLOBOCAN data for 2018, the number of new cases in the

za žene. KRK je drugi vodeći uzrok obolevanja kod muškaraca (iza karcinoma pluća), sa procentualnim učešćem od 15,0% među svim novoobolelim od malignih tumora u Srbiji, a treći kod žena (iza karcinoma dojke i pluća), sa učešćem od 10,4% (3). Stope incidencije KRK rastu sa godinama starosti.

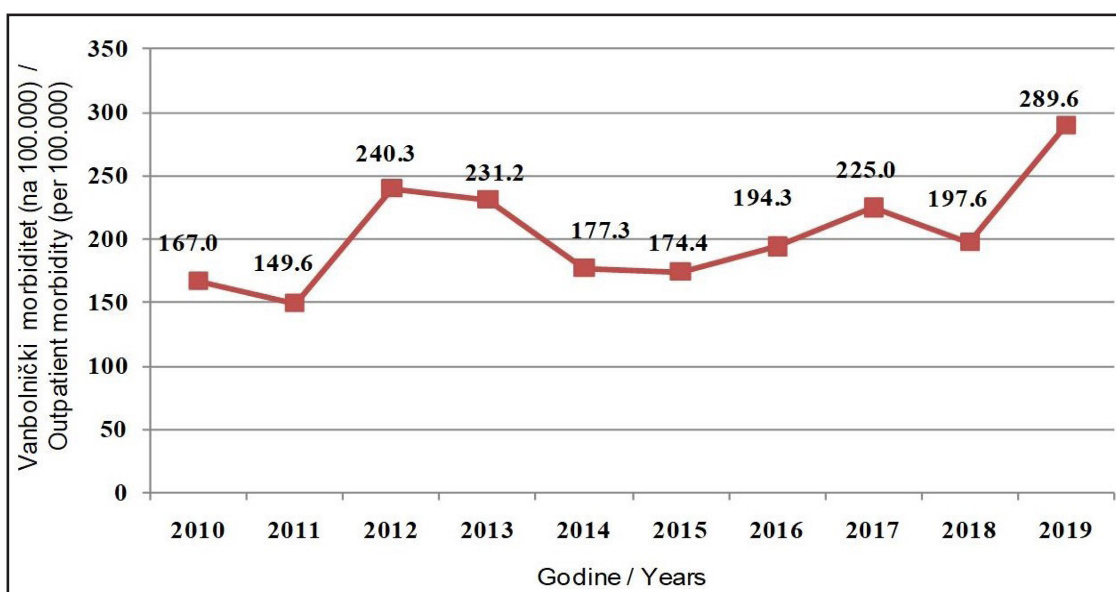
Standardizovana stopa mortaliteta (na 100.000) za rak kolorektuma je u Srbiji, 2018. godine, prema podacima GLOBOCAN-a, bila 16,8 za celokupnu populaciju, odnosno 23,3 za muškarce i 11,6 za žene (3). Na osnovu stope mortaliteta, Srbija pripada zemljama sa visokim mortalitetom. Kod oba pola, stope mortaliteta za rak kolorektuma rastu sa godinama starosti i najviše su kod osoba starosti 75 i više godina.

Cilj ovog rada je bio da se kod odraslih analizira kretanje vanbolničkog morbiditeta, kao i stope hospitalizacije i mortaliteta za KRK na teritoriji Južnobanatskog okruga u periodu 2010-2019. godine.

Metod

Podaci o obolevanju i umiranju od KRK (MKB-10 šifre C18-C21) u Južnobanatskom okrugu preuzeti su iz rutinske zdravstvene statistike. Podaci o registrovanom vanbolničkom morbiditetu (koji obuhvata novoobolele i staroobolele) dobijeni su na osnovu podataka iz zdravstveno statističkih izveštaja o utvrđenim oboljenjima i stanjima (Obrazac SI - 06) u osam domova zdravlja Južnobanatskog okruga (Alibunar, Bela Crkva, Vršac, Kovačica, Kovin, Opovo, Pančevo i Plandište) u službama za zdravstvenu zaštitu odraslih. Za podatke o hospitalizaciji korišćene su elektronske baze izveštaja o hospitalizaciji, a podaci o mortalitetu dobijeni su iz elektronske baze o umrlim licima koja se formira iz obrasca potvrde o smrti (Obrazac DM 2), i analizirani su za period 2010-2019. godine.

U radu je primenjen deskriptivni statistički metod rada. U cilju analize podataka u radu je korišćen vanbolnički morbiditet, stopa hospitalizacije i stopa mortaliteta za odraslu populaciju uzrasta od 18 i više godina. Vanbolnički morbiditet predstavlja odnos između ukupnog broja obolelih (novoobolelih i staroobolelih) od KRK koji su se javili u osam ustanova primarne zdravstvene zaštite na području Južnobanatskog okruga tokom jedne godine i broja stanovnika datog okruga. Stopa hospitalizacije izračunata je kao odnos broja hospitalizovanih pacijenata zbog KRK tokom jedne godine u dve bolnice na teritoriji Južnobanatskog okruga i broja stanovnika na teritoriji Južnobanatskog okruga prema popisu stanovništva iz 2011. godine. Stopa mortaliteta je računata kao odnos između broja umrlih od KRK na teritoriji Južnobanatskog okruga tokom godine i broja stanovnika okruga. Broj stanovnika je određen prema popisu iz 2011. godine. Sve izračunate stope su iskazane na 100.000 stanovnika.



Grafikon 1. Vanbolnički morbiditet (na 100.000) kolorektalnog karcinoma (C18-C21) u Južnobanatskom okrugu u periodu 2010-2019. godine, uzrast 18 i više godina

male population amounted to 3,775, while this number was 2,374 in the female population (3). The standardized incidence rate (per 100,000) for CRC was 36.7 for the whole population, 49.0 for males and 26.4 for females. CRC is the second leading cause of developing disease in men (after lung cancer) with the share of 15% among all new cases of malignant tumors in Serbia, while it is the third cause in women (after breast cancer and lung cancer) with the share of 10.4% (3). Incidence rates of CRC increase as people get older.

The standardized mortality rate (per 100,000) for colorectal cancer in Serbia in 2018, according to the GLOBOCAN data, was 16.8 for the whole population, that is, 23.3 for males and 11.6 for females (3). According to the mortality rate, Serbia belongs to the countries with high mortality. In both males and females, mortality rates for colorectal cancer increase as people get older and they are highest among people aged 75 and more.

The aim of this study was to analyze the trend of outpatient morbidity in adults, as well as the hospitalization and mortality rate for CRC on the territory of the South Banat District from 2010 to 2019.

Methods

Data about developing colorectal cancer and dying from it in the South Banat District were taken from the routine health statistics. Data about the registered outpatient morbidity (which includes new cases and preexisting cases, as well) were obtained based on the data from health statistical reports about the confirmed diseases and states (Form SI – 06) in eight health care centers of the South Banat District (Alibunar, Bela Crkva, Vrsac, Kovacica, Kovin, Opovo, Pancevo, and Plandiste) at the departments for the health care of adults. The electronic databases of reports about hospitalization were used for the data about hospitalization, while the data about mortality were obtained from the electronic database of deaths, which is formed from the certificate of death form (Form DM), and these data were analyzed for the period 2010-2019.

The descriptive statistical method was used in the study. In order to analyze data, outpatient morbidity, hospitalization rate and mortality rate were used in the study for the population aged 18 and older. Outpatient morbidity is the ratio between the total number of ill people (new and preexisting cases), who developed CRC and who visited eight institutions of primary health care on the territory of the South Banat District during one year, and the number of people from that district. The hospitalization rate was calculated as the ratio of the number of hospitalized patients due to CRC during one year at two hospitals on the territory of the South Banat District and the number of people living on the territory of the South Banat

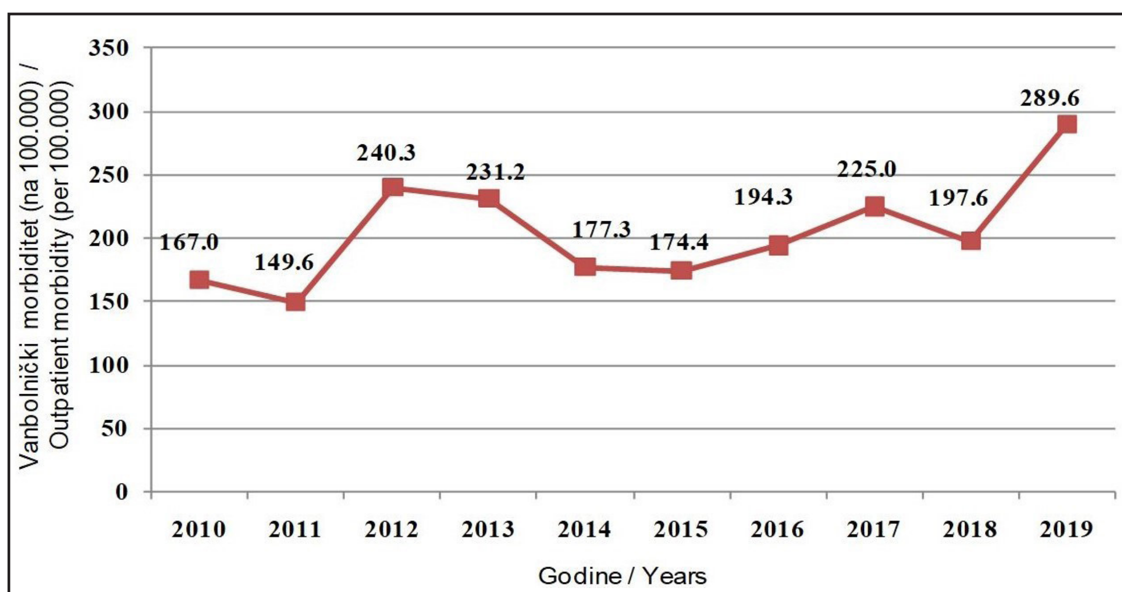
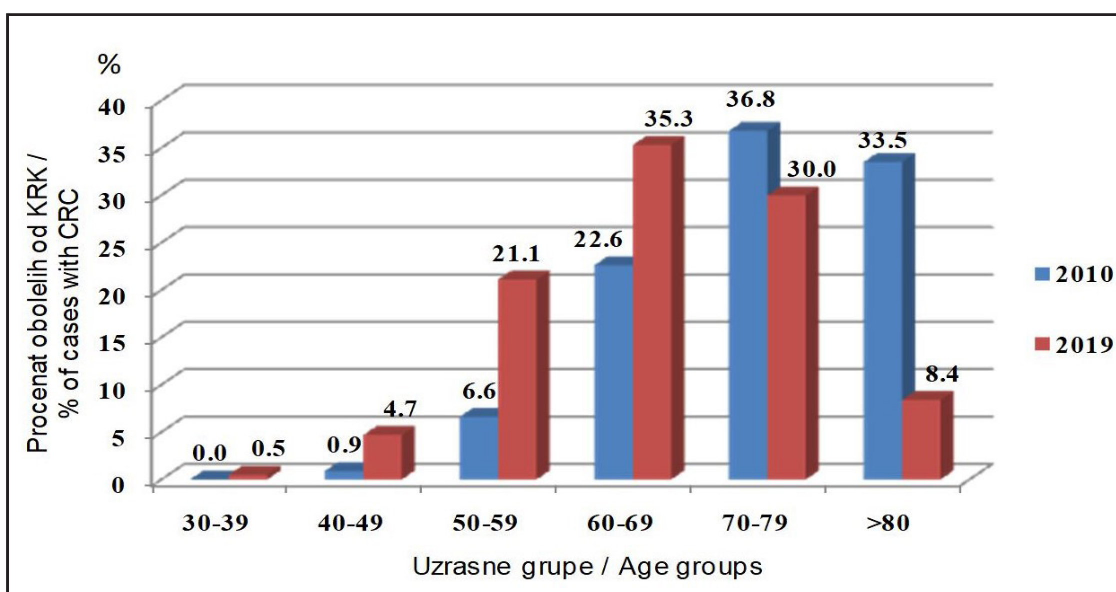


Figure 1. Outpatient morbidity (per 100,000) of colorectal cancer (CRC) (C18-C21) in the South Banat District in the period 2010-2019. years, age 18 and over



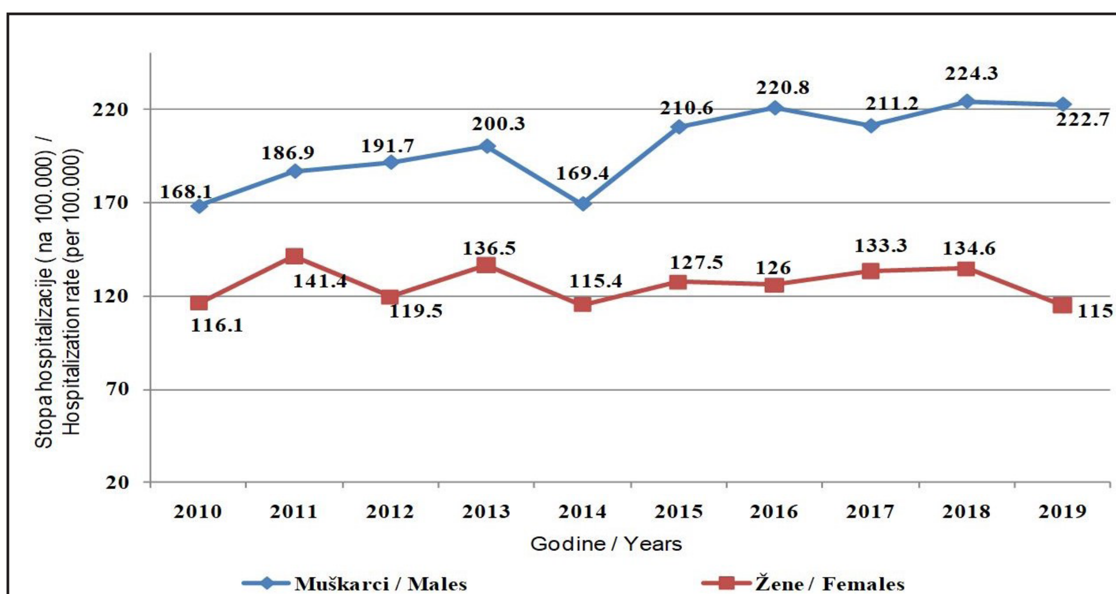
Grafikon 2. Vanbolnički morbiditet (na 100.000) kolorektalnog karcinoma (C18-C21) u Južnobanatskom okrugu u periodu 2010-2019. godine, uzrast 18 i više godina

Rezultati

U Južnobanatskom okrugu, vanbolnički morbiditet KRK je u stalnom porastu tokom deset poslednjih godina i kretao se od 167,0 obolelih na 100.000 stanovnika u 2010. godini do 289,6 obolelih na 100.000 u 2019. godini (grafikon 1).

U ovom okrugu stacionarnu zdravstvenu zaštitu za 279.281 gravitirajućih stanovnika pružaju dve opšte bolnice: Opšta bolnica Pančevo i Opšta bolnica Vršac sa ukupno 950 standardnih bolničkih postelja. U posmatranom periodu od 2010. do 2019. godine, u Opštoj bolnici u Vršcu je zbog KRK prosečno godišnje lečeno 75 pacijenata, a u Opštoj bolnici u Pančevu 139, što je ukupno 214. Prosečna dužina lečenja pacijenata sa KRK je bila 8,4 dana. Oko 2/3 hospitalizovanih osoba sa KRK u ove dve opšte bolnice je bilo starosti 60-79 godina u 2019. godini, a 2010. godine starosti 70 i više godina (grafikon 2).

Stopa hospitalizacije KRK u obe opšte bolnice na području Južnobanatskog okruga su rasle tokom vremena i imale su, tokom svih deset godina, veće vrednosti kod muškarca nego kod žena. Najniže vrednosti se kod žena registruju u 2014. godini, a kod muškaraca u 2010. godini.



Grafikon 3. Stopa hospitalizacije (na 100.000) kolorektalnog karcinoma (KRK) (C18-C21) u Južnobanatskom okrugu u periodu 2010-2019. godine, uzrast 18 i više godina, prema polu

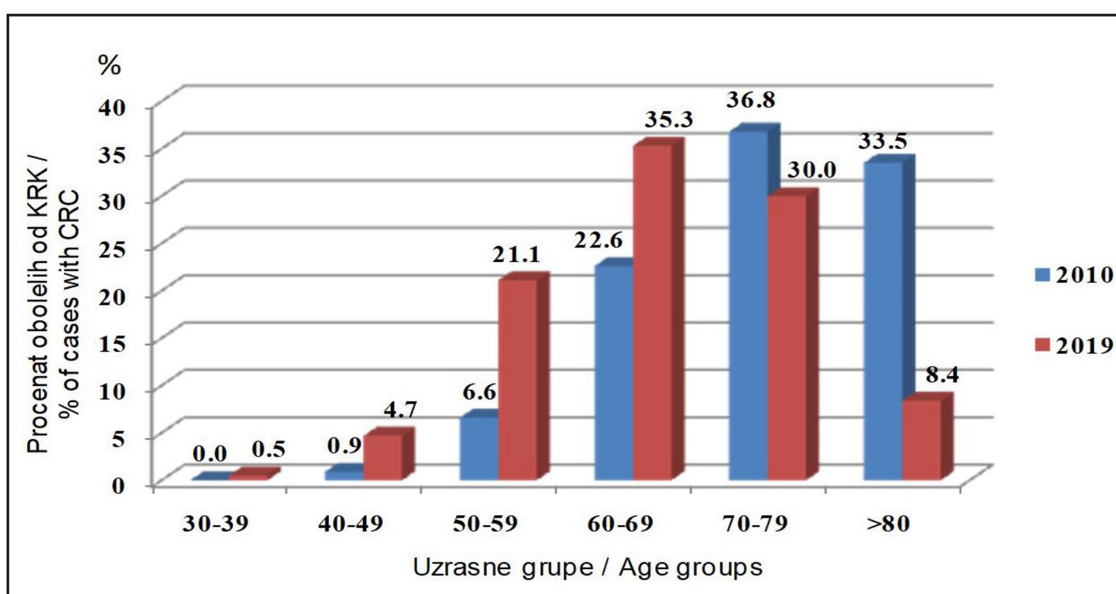


Figure 2. Distribution of hospital patients treated for colorectal cancer in relation to age, the South Banat district, 2010 and 2019, age 18 and over

District according to the census from 2011. The mortality rate was calculated as the ratio of the number of people who died from CRC on the territory of the South Banat District during one year and the number of people from that district. The population was determined according to the census from 2011. All calculated rates were expressed per 100.000 people.

Results

In the South Banat District, outpatient morbidity of CRC has been constantly on the rise in the last ten years and it ranged from 167.0 people who developed the disease per 100,000 in 2010 to 289.6 people who developed this disease per 100,000 in 2019 (Figure 1).

In this district, stationary health care for 279,281 people, who gravitate there, is offered by two general hospitals: General Hospital Pancevo and General Hospital Vrsac with a total of 950 standard hospital beds. In the observed period from 2010 to 2019, on average, 75 patients were treated for CRC annually in the General Hospital in Vrsac, while 139 patients were treated in the General Hospital Pancevo, that is, 214 in total. The average length of treatment of patients with

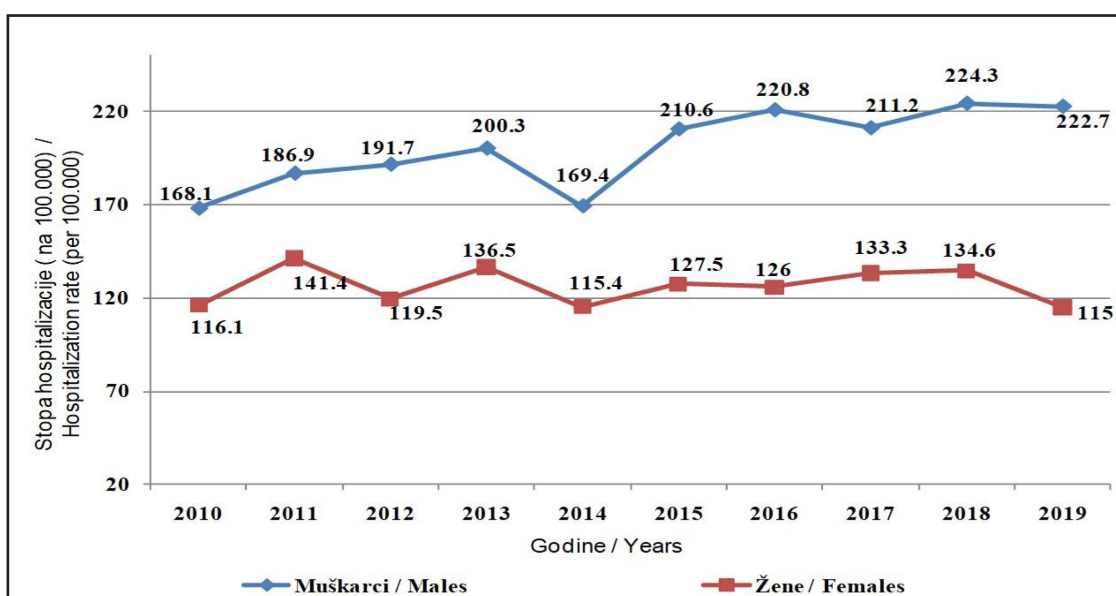
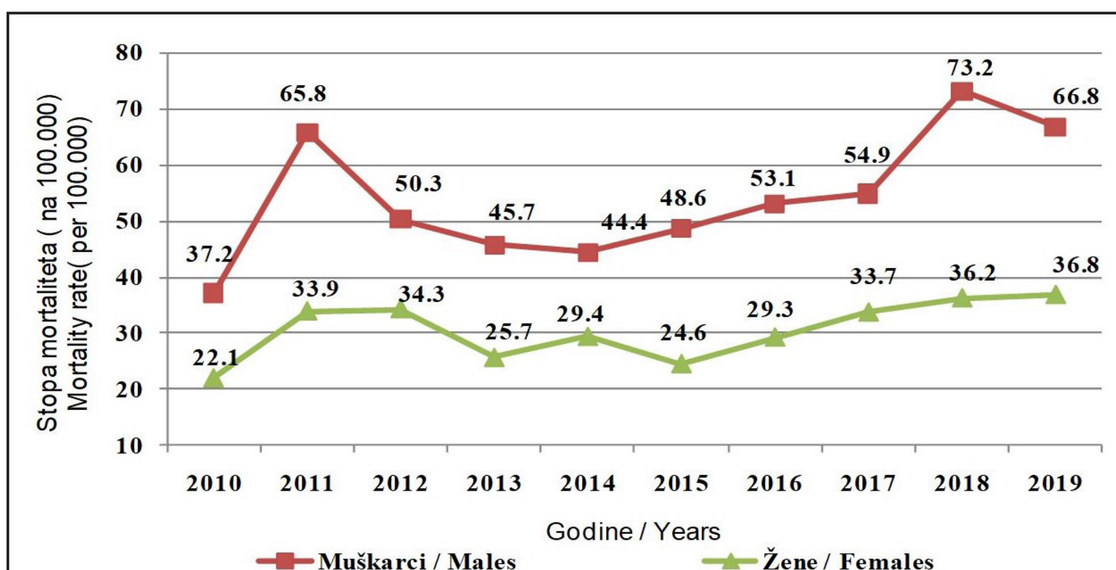


Figure 3. Hospitalization rates (per 100,000) because colorectal cancer (CRC) (C18-C21) in the South Banat District in the period 2010-2019, age 18 and over, according to gender



Grafikon 4. Stopa mortaliteta (na 100.000) od kolorektalnog karcinoma (KRK) (C18-C21) u Južnobanatskom okrugu u periodu 2010-2019. godine, uzrast 18 i više godina, prema polu

Kod žena se registruje značajniji pad stope hospitalizacije u 2019. godini (grafikon 3).

Svake godine zbog ove maligne bolesti život na teritoriji okruga izgubi prosečno 110 stanovnika godišnje. Kod oba pola stopa mortaliteta KRK je u porastu tokom posmatranog perioda (grafikon 4), a tokom čitavog posmatranog perioda stope su više kod muškaraca nego kod žena.

Kod muškog pola uočava se pad stope mortaliteta u periodu 2011-2014. godine, a kod žena se, takođe, u dva navrata (2011-2013. i 2014-2015. godine) beleži pad stope mortaliteta.

U 2019. godini, među svim umrlim muškarcima u Južnobanatskom okrugu, rak KRK je bio deveti vodeći uzrok umiranja, sa procentualnim učešćem među svim umrlima od 3,1%, a u populaciji žena trinaesti, sa procentualnim učešćem od 1,8% (tabele 1 i 2). Kod muškaraca se u posmatranom desetogodišnjem periodu procentualno učešće KRK u ukupnom mortalitetu povećalo sa 2,4% u 2010. godini na 3,1% u 2019. Kod žena, takođe, postoji blagi porast procentualnog učešća KRK među svim umrlima sa 1,5% u 2010. godini na 1,8% u 2019. godini.

Od malignih bolesti kod muškaraca jedino zloćudni tumor bronha i pluća ima veći rang i veći procentualni udeo u ukupnom mortalitetu od KRK (na četvrtom je mestu sa procentualnim učešćem od 6,4% u 2019. godini). Kod žena zloćudni tumor dušnika i pluća (3,7%), zloćudni tumor dojke (3,2%) i zloćudni tumori ženskih polnih organa (2,5%) imaju veće procentualno učešće u ukupnom mortalitetu nego KRK i nalaze se na osmom, devetom i desetom mestu među deset vodećih uzroka smrti kod žena u 2019. godini.

U 2019. godini najveći broj umrlih od KRK (oko 2/3) je bio u populaciji muškaraca i žena Južnobanatskog okruga uzrasta 60-79 godina (grafikon 5). U odnosu na 2010. godinu, u 2019. godini kod oba pola dolazi do pojave smrtnih ishoda i u uzrastu 50-59 godina (11,3% je umrlih muškaraca i 19,3% žena tog uzrasta).

Diskusija

Prema podacima GLOBOCAN-a, KRK u svetu predstavlja veliki javno zdravstveni problem, jer je 2018. godine, registrovano 1.849.518 novoobolelih i 880.792 umrlih (3). KRK predstavlja treći vodeći uzrok obolevanja među svim malignim tumorima u svetu (iza raka pluća i raka dojke), a četvrti je uzrok umiranja (4). Srbija je na osnovu stope incidencije za KRK na 22. mestu u Evropi, a po stopi mortaliteta na šestom mestu (5).

U Južnobanatskom okrugu tokom poslednjih deset godina dolazi do porasta vanbolničkog morbiditeta KRK sa 167,0 obolelih na 100.000 stanovnika u 2010. godini, na 289,6 obolelih na 100.000 u 2019. godini. Prema podacima iz literature, petogodišnja prevalencija KRK (na 100.000) za evropske zemlje iznosi 188,7, za područje Severne Amerike 146,8, a za svetsku populaciju 62,8 (6). Međutim, veći vanbolnički

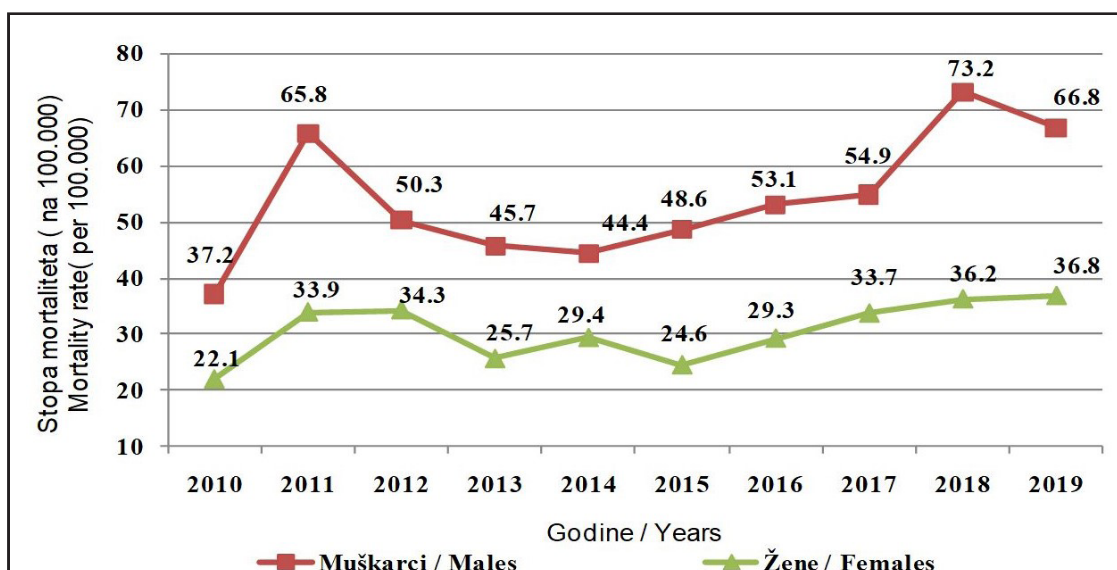


Figure 4. Colorectal cancer (CRC) (C18-C21) mortality rate (per 100,000) in the South Banat District in the period 2010-2019, age 18 and over, according to sex

CRC was 8.4 days. Around 2/3 of hospitalized patients with CRC in these two general hospitals were aged 60-79 years in 2019, and 70 and older in 2010 (Figure 2).

The hospitalization rates for CRC in both general hospitals on the territory of the South Banat District increased over time and they were higher in men than in women during all ten years. The lowest values in women were registered in 2014, while in men they were registered in 2010. In females, a significant decrease in the hospitalization rate was registered in 2019 (Figure 3).

On average, 110 people lose their lives due to this malignant disease on the territory of this district each year. In both males and females, the mortality rate of CRC was on the rise during the observed period (Figure 4), while during the whole observed period rates were higher in males than in females.

In males, the decrease in the mortality rate was noticed from 2011 to 2014, while in females this decrease was noted during two time periods (2011-2013 and 2014-2015).

In 2019, among all males who died in the South Banat District, colorectal cancer was the ninth leading cause of death with the share of 3.1% of all deaths, while in the population of females it was the thirteenth leading cause, with the share of 1.8% (Tables 1 and 2). In males in the observed time period of ten years, the share in percentages of CRC in total mortality increased from 2.4% in 2010 to 3.1% in 2019. In females, the share in percentages of CRC in relation to all deaths increased from 1.5% in 2010 to 1.8% in 2019.

Of all malignant diseases in males, only the malignant bronchial and lung tumors were ranked higher and had a higher share in total mortality than CRC (it was in the fourth place with the share of 6.4% in 2019). In females, the malignant tumor of trachea and lungs (3.7%), the malignant breast tumor (3.2%) and malignant tumors of female genital organs (2.5%) had a higher share in total mortality than CRC and they were on the eighth, ninth and tenth place among the ten leading causes of death in 2019.

In 2019, the greatest number of deaths from CRC (around 2/3) was in the population of males and females from the South Banat District aged 60-79 (Figure 5). In comparison to 2010, there came to the deathly outcomes among people aged 50-59 in 2019 (there were 11.3% of men and 19.3% of women who died and were in that age group).

Discussion

According to the GLOBOCAN data, CRC is a major public health problem, because in 2018 there were 1.849.518 registered people and 880.792 deaths (3). CRC is the third leading cause of developing disease among all malignant tumors in the world (behind lung and breast cancer), while it is the fourth cause of dying (4).

Tabela 1. Deset vodećih uzroka smrti u populaciji muškaraca u Južnobanatskom okrugu u 2010. i 2019. godini

Rang za 2019. ***Rank for 2019***	**MKB-10 šifra/** ***ICD-10 code***	**Uzrok smrti/** ***Cause of death***	**Broj umrlih (2019.)/** ***Number of deaths (2019)***	**%**	**Broj umrlih (2010.)/** ***Number of deaths (2010)***	**%**
1	I46	Zastoj srca/ *Heart failure*	241	11.0	77	3.5
2	R00-R99	Simptomi, znaci i patološki klinički i laboratorijski nalazi/ *Symptoms, signs and pathological clinical and laboratory findings*	195	8,9	58	2.7
3	I10-I15	Bolesti uzrokovane povišenim krvnim pritiskom/ *Diseases caused by high blood pressure*	161	7.4	183	8.4
4	C34	Zloćudni tumor dušnika i pluća / *Malignant tumor of the trachea and lungs*	139	6.4	182	8.3
5	I42	Oboljenje srčanog mišića/ *Heart muscle disease*	153	7.0	279	12.8
6	I60-I69	Bolesti krvnih sudova mozga/ *Diseases of the blood vessels of the brain*	131	6.0	167	7.6
7	I20-I25	Ishemijske bolesti srca / *Ischemic heart disease*	120	5.5	239	10.9
8	I50	Nedovoljna funkcija srca/ *Insufficient heart function*	117	5.3	66	3.0
9	C18-C21	Zloćudni tumori debelog creva i rektuma/ *Malignant tumors of the colon and rectum*	67	3.1	52	2.4
10	J40-J47	Hronične bolesti donjeg dela sistema za disanje/ *Chronic diseases of the lower respiratory system*	55	2.5	52	2.4
11		Ostali uzroci smrti/ *Other causes of death*	808	36.9	833	38
		Ukupno umrli/ *Total deaths*	2187	100	2188	100

morbiditet ne mora obavezno da znači i veći broj bolesnih od KRK u populaciji, već može biti posledica češćeg korišćenja zdravstvene službe ili nepravilnog evidentiranja hroničnih bolesti više puta tokom godine.

Porast broja obolelih od KRK u svetu i regionu pripisuje se, pre svega, prihvatanju „zapadnog" načina života, kao i porastu gojaznih, fizički neaktivnih, pušača i ekscesivnih konzumenata alkohola i crvenog mesa. Potencijalno smanjenje broja obolelih postiže se širokom primenom mera prevencije i boljim modalitetima lečenja, pogotovo u ranijim stadijumima bolesti (7).

U našem radu je registrovan porast stope hospitalizacije KRK kod oba pola, i one su više kod muškaraca nego kod žena tokom čitavog desetogodišnjeg perioda. U istraživanju brazilskih autora takođe je uočen porast stope

Table 1. Ten leading causes of death in the population of men in the South Banat District in 2010 and 2019

Rang za 2019./ ***Rank for 2019***	**MKB-10 šifra/** ***ICD-10 code***	**Uzrok smrti/** ***Cause of death***	**Broj umrlih (2019.)/** ***Number of deaths (2019)***	**%**	**Broj umrlih (2010.)/** ***Number of deaths (2010)***	**%**
1	I46	Zastoj srca/ *Heart failure*	241	11.0	77	3.5
2	R00-R99	Simptomi, znaci i patološki klinički i laboratorijski nalazi/ *Symptoms, signs and pathological clinical and laboratory finding*s	195	8,9	58	2.7
3	I10-I15	Bolesti uzrokovane povišenim krvnim pritiskom/ *Diseases caused by high blood pressure*	161	7.4	183	8.4
4	C34	Zloćudni tumor dušnika i pluća/ *Malignant tumor of the trachea and lungs*	139	6.4	182	8.3
5	I42	Oboljenje srčanog mišića/ *Heart muscle disease*	153	7.0	279	12.8
6	I60-I69	Bolesti krvnih sudova mozga/ *Diseases of the blood vessels of the brain*	131	6.0	167	7.6
7	I20-I25	Ishemijske bolesti srca / *Ischemic heart disease*	120	5.5	239	10.9
8	I50	Nedovoljna funkcija srca/ *Insufficient heart function*	117	5.3	66	3.0
9	C18-C21	Zloćudni tumori debelog creva i rektuma/ *Malignant tumors of the colon and rectum*	67	3.1	52	2.4
10	J40-J47	Hronične bolesti donjeg dela sistema za disanje/ *Chronic diseases o*f the lower respiratory system	55	2.5	52	2.4
11		Ostali uzroci smrti/ *Other causes of death*	808	36.9	833	38
		Ukupno umrli/ *Total deaths*	2187	100	2188	100

Serbia is according to the incidence rate for CRC on the 22nd place in Europe, and according to the mortality rate in the sixth place (5).

In the South Banat District during the last ten years, the outpatient morbidity of CRC has increased from 167.0 ill people per 100,000 in 2010 to 289.6 ill people per 100,000 in 2019. According to the data from the literature, the five-year prevalence of CRC (per 100,000) in the European countries amounted to 188.7, while in the North America it was 146.8, and for the world population it was 62.8 (6). However, higher outpatient morbidity does not necessarily mean that the number of people who developed CRC is higher, but it can be the consequence of more frequent use of health care services or incorrect records of chronic diseases several times a year.

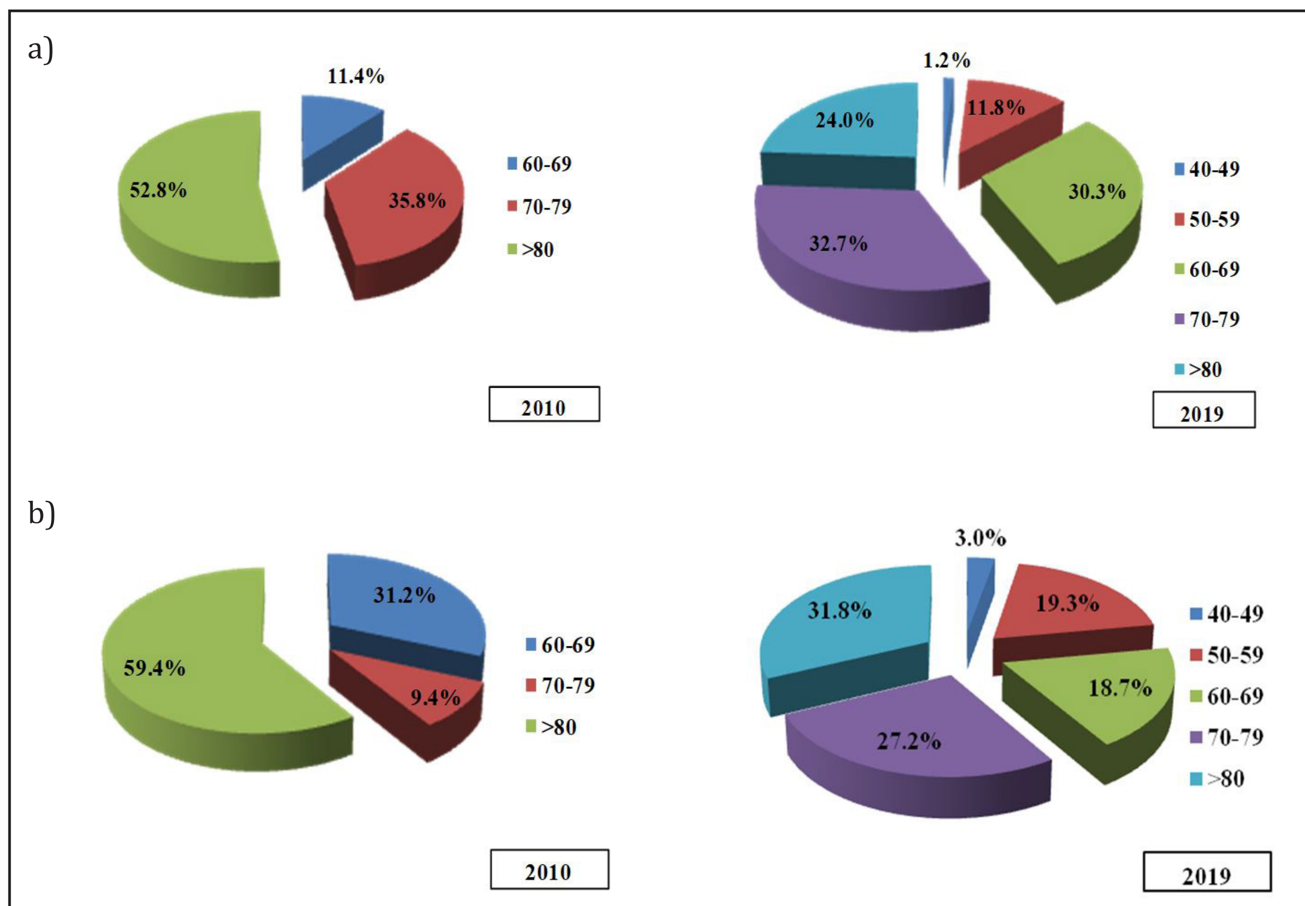
The increase in the number of people who

Tabela 2. Deset vodećih uzroka smrti u populaciji žena u Južnobanatskom okrugu u 2010. i 2019. godini

Rang za 2019./ ***Rank for 2019***	**MKB-10 šifra/** ***ICD-10 code***	**Uzrok smrti/** ***Cause of death***	**Broj umrlih (2019.)/** ***Number of deaths (2019)***	**%**	**Broj umrlih (2010.)/** ***Number of deaths (2010)***	**%**
1	I46	Zastoj srca/ *Heart failure*	239	11.9	151	7.1
2	I10-I15	Bolesti uzrokovane povišenim krvnim pritiskom/ *Diseas*es caused by high blood pressure	227	11.3	270	12.7
3	I42	Oboljenje srčanog mišića/ *Heart muscle disease*	218	10.8	402	18.9
4	R00-R99	Simptomi, znaci i patološki klinički i laboratorijski nalazi/ *Symptoms, signs and pathological clinical and laboratory findings*	162	8.0	34	1.6
5	I60-I69	Bolesti krvnih sudova mozga/ *Diseases of the blood vessels of the brain*	139	6.9	195	9.2
6	I50	Nedovoljna funkcija srca/ *Insufficient heart function*	111	5.5	73	3.4
7	I20-I25	Ishemijske bolesti srca/ *Ischemic heart disease*	97	4.8	210	9.9
8	C34	Zloćudni tumor dušnika i pluća/ *Malignant tumor of the trachea and lungs*	75	3.7	65	3.1
9	C50	Zloćudni tumor dojke/ *Malignant breast tumor*	64	3.2	59	2.8
10	C51-C58	Zloćudni tumori ženskih polnih organa/ *Malignant tumors* of the female genital organs	51	2.5	64	3.0
11	J40-J47	Hronične bolesti donjeg dela sistema za disanje/ *Chronic diseases of the lower respiratory system*	41	2.0	27	1.3
12	E10-E14	Šećerna bolest/ *Diabetes mellitus*	39	1.9	66	3.1
13	C18-C21	Zloćudni tumori debelog creva i rektuma/ *Malignant tumors of the colon and rectum*	37	1.8	32	1.5
14		Ostali uzroci smrti/ *Other causes of death*	514	25.5	474	22.3
		Ukupno umrli/ *Total deaths*	2014	100	2122	100

Table 2. Ten leading causes of death in the population of women in the South Banat District in 2010 and 2019

Rang za 2019. / ***Rank for 2019***	**MKB-10 šifra/** ***ICD-10 code***	**Uzrok smrti/** ***Cause of death***	**Broj umrlih (2019.)/** ***Number of deaths (2019)***	**%**	**Broj umrlih (2010.)/** ***Number of deaths (2010)***	**%**
1	I46	Zastoj srca/ *Heart failure*	239	11.9	151	7.1
2	I10-I15	Bolesti uzrokovane povišenim krvnim pritiskom/ *Diseases caused by high blood pressure*	227	11.3	270	12.7
3	I42	Oboljenje srčanog mišića/ *Heart muscle disease*	218	10.8	402	18.9
4	R00-R99	Simptomi, znaci i patološki klinički i laboratorijski nalazi/ *Symptoms, signs and pathological clinical and laboratory findings*	162	8.0	34	1.6
5	I60-I69	Bolesti krvnih sudova mozga/ *Diseases of the blood vessels of the brain*	139	6.9	195	9.2
6	I50	Nedovoljna funkcija srca/ *Insufficient heart function*	111	5.5	73	3.4
7	I20-I25	Ishemijske bolesti srca/ *Ischemic heart disease*	97	4.8	210	9.9
8	C34	Zloćudni tumor dušnika i pluća/ *Malignant tumor of the trachea and lungs*	75	3.7	65	3.1
9	C50	Zloćudni tumor dojke/ *Malignant breast tumor*	64	3.2	59	2.8
10	C51-C58	Zloćudni tumori ženskih polnih organa/ *Malignant tumors of the female genital organs*	51	2.5	64	3.0
11	J40-J47	Hronične bolesti donjeg dela sistema za disanje/ *Chronic diseases of the lower respiratory system*	41	2.0	27	1.3
12	E10-E14	Šećerna bolest/ *Diabetes mellitus*	39	1.9	66	3.1
13	C18-C21	Zloćudni tumori debelog creva i rektuma/ *Malignant tumors of the colon and rectum*	37	1.8	32	1.5
14		Ostali uzroci smrti/ *Other causes of death*	514	25.5	474	22.3
		Ukupno umrli/ *Total deaths*	2014	100	2122	100



Grafikon 5. Distribucija umrlih od kolorektalnog karcinoma prema uzrastu u populaciji muškaraca (a) i žena (b) Južnobanatskog okruga u 2010. i 2019. godini

hospitalizacije u periodu 2002-2016. godine, a stopa hospitalizacije KRK za muškarce (35,8 na 100.000) je bila, tokom posmatranog perioda, viša nego kod žena (33,6 na 100.000). Najviša stopa hospitalizacije zabeležena je za uzrast 70-79 godina i iznosila je 175,4 na 100.000 (8), što je slično rezultatima našeg israživanja.

U Južnobanatskom okrugu, prosečna dužina bolničkog lečenja za lica hospitalizovana zbog KRK je bila 8,4 ± 11,6 dana, a prosečna starost lečenih 66,8 ± 10,7 godina. Davidović i saradnici navode da je prosečna starost lica hospitalizovanih zbog hirurškog lečenja KRK u Opštoj bolnici u Kikindi 67,4 ± 10,4 godina, a prosečan broj dana hospitalizacije po pacijentu 18,7 ± 11,0 dana (9). U doktorskoj disertaciji Krdžića (10) prosečna starost pacijenata hospitalizovanih zbog KRK je bila 67,3 ± 10,3 godine, a dužina njihovog boravka u bolnici 12,4 ± 7,2 dana.

U Južnobanatskom okrugu, stopa mortaliteta od KRK je u porastu i tokom svih posmatranih godina viša je kod muškaraca nego žena (u 2019. iznosi 66,8 na 100.000 za muški a 36,8 na 100.000 za ženski pol). *Wong* i saradnici navode u svom istraživanju da na nivou evropskih zemalja stopa mortaliteta od KRK iznosi 32,6 na 100.000, a na svetskom nivou 11,5 na 100.000 (6). Slične rezultate dobili su Petrović i saradnici (11). U opštini Niš prosečna godišnja stopa mortaliteta (na 100.000) od KRK, u periodu od 1986. do 1997. godine, iznosila je 29,4 (kod muškaraca 30,7, a kod žena 19,3). Takođe, beleži se trend porasta stope mortaliteta KRK kod oba pola, ali on nije bio statistički značajan. Kod oba pola, najveća stopa mortaliteta za KRK u opštini Niš je registrovana kod osoba starijih od 70 godina, a sa godinama starosti, raste stopa mortaliteta (11). U našem radu 87% muškaraca i 78% žena umrlih od KRK je bilo starije od 60 godina, a u doktorskoj disertaciji Petrovića većina umrlih od KRK (80%) su bile osobe starije od 65 godina (12).

Razlozi povećanog trenda vanbolničkog morbiditeta, hospitalizacije i mortaliteta stanovništva Južnobanatskog okruga su brojni. Deo ovog porasta može se objasniti većom izloženošću populacije brojnim faktorima

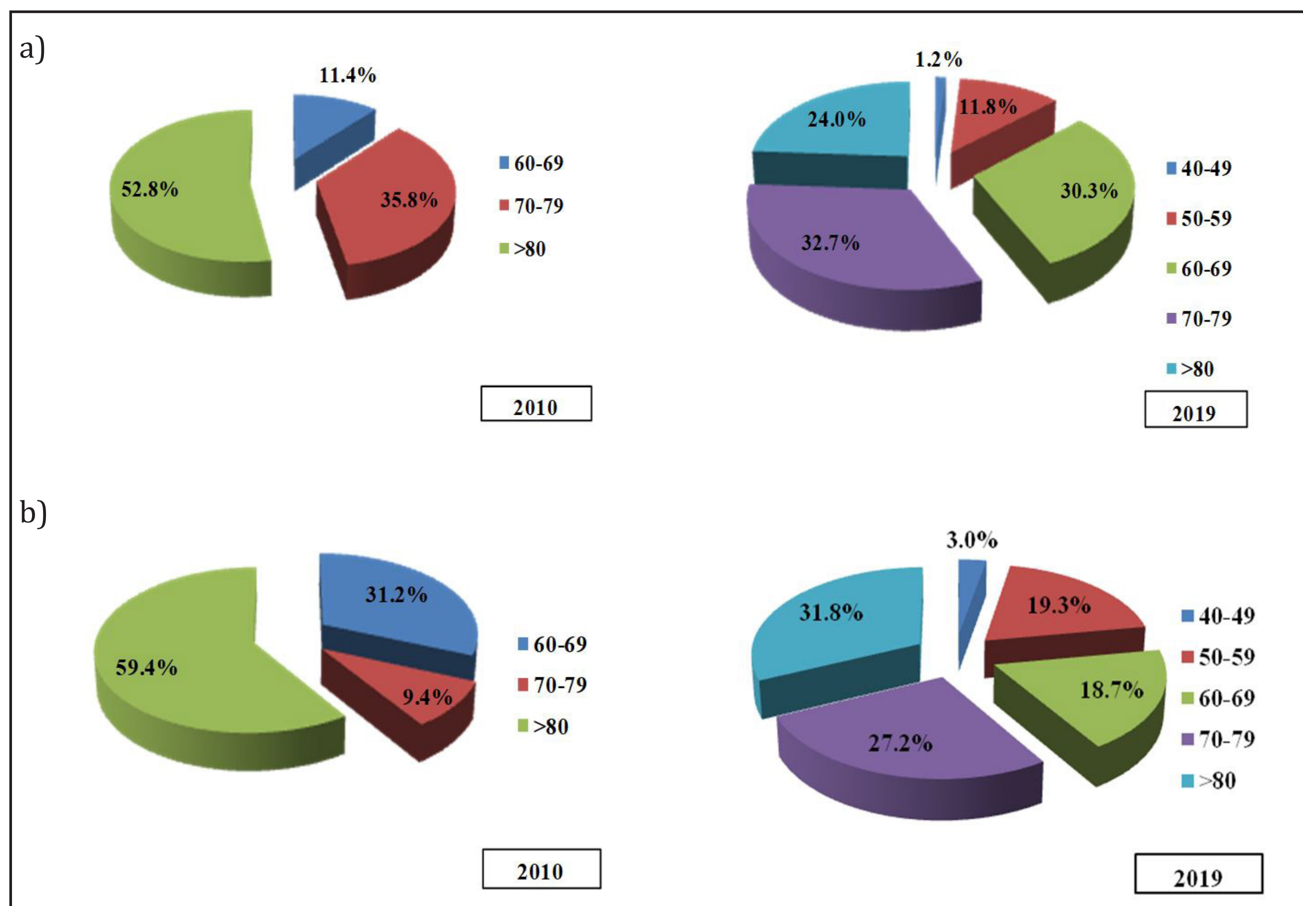


Figure 5. Distribution of deaths from colorectal cancer by age in the population of men (a) and women (b) of the South Banat District in 2010 and 2019

developed CRC in the world and region is ascribed firstly to the "western" way of life, as well as to the increase of obese people, physically inactive people, smokers and excessive consumers of alcohol and red meat. A potential decrease in the number of ill people is achieved by the wide application of preventive measures and better modalities of treatment, especially in the earlier stages of diseases (7).

In our study, the increase of the hospitalization rate of CRC was registered in both sexes and these rates were higher in men than in women during the whole ten year period. In the research of Brazilian authors, the increase of hospitalization rate was also noted in the period 2002-2017, while the hospitalization rate of CRC was higher in men (35.8 per 100,000) than in women (33.6 per 100,000) during the observed time period. The highest hospitalization rate was noted in the age group 70-79 years and it amounted to 175.4 per 100,000 (8), which is similar to the results of our research.

In the South Banat District, the average length of hospital treatment for people hospitalized due to CRC was 8.4 ± 11.6 days, while the average age of treated people was 66.8 ± 10.7 years. Davidovic and associates state that the average age of people hospitalized due to the surgical treatment of CRC at the General Hospital in Kikinda was 67.4 ± 10.4 years, while the average number of hospitalization days was 18.7 ± 11.0 days per patient (9). In the doctoral dissertation of Krdzic (10), the average age of patients hospitalized due to CRC was 67.3 ± 10.3 years, while the length of their stay in the hospital was 12.4 ±7.2 days.

In the South Banat District, the mortality rate of CRC was on the rise and during all years that we observed it was higher in men than in women (in 2019 it amounted to 66.8 per 100,000 for men and 36.8 per 100,000 for women). Wong and associates state in their study that at the level of European countries the mortality rate of CRC amounted to 32.6 per 100,00, and at the world level 11.5 per 100,000 (6). Similar results were obtained by Petrovic and associates (11). In the municipality of Nis, the average annual mortality rate (per 100,000) of CRC amounted

rizika. Eventualni problemi sa dostupnošću zdravstvene službe, takođe, doprinose smanjenju stepena preživljavanja pacijenata i imaju udela u porastu broja hospitalizacija i umiranja. Povećanje kapaciteta zdravstvenog sistema sa kojima se uspostavlja rana dijagnoza bolesti, obuka i edukacija kadra i napredak medicinskih tehnologija, takođe, mogu doprineti porastu vanbolničkog morbiditeta i hospitalizacije, a smanjivanju mortaliteta (8).

Zaključak

U cilju unapređenja zdravlja stanovnika Južnobanatskog okruga neophodna je redovna kontrola zdravlja i sprovođenje skrining programa za rano otkrivanje KRK što bi doprinelo ranom otkrivanju bolesti u populaciji pod rizikom. Intenzivnijom promocijom zdravlja i zdravih stilova života može se doprineti redukovanju poznatih faktora rizika odgovornih za nastanak KRK u populaciji: nepravilna ishrana (hrana bogata zasićenim mastima, a sa malim unosom vlakana), gojaznost, pušenje, postojanje crevnih polipa, nedostatak fizičke aktivnosti i drugo.

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to 29.4 from 1986 to 1997 (30.7 in men and 19.3 in women). Also, the trend in increase of mortality rates of CRC was noted in both sexes, but it was not statistically significant. In both sexes, the highest mortality rate for CRC in the municipality of Nis was registered in people older than 70, and the mortality rate increases as people get older (11). In our study, 87% of men and 78% of women who died from CRC were older than 60, and in the doctoral dissertation of Petrovic, the majority of people who died from CRC (80%) were people older than 65 (12).

The reasons for the increased trend of outpatient morbidity, hospitalization and mortality among the population of the South Banat District are numerous. A part of this increase can be explained by the higher exposure of this population to numerous risk factors. Potential problems with the availability of health care services also contribute to the decrease in the level of patients' survival and they also participate in the increase in the number of hospitalizations and deaths. The increase of the capacities of the health care system together with the early diagnosis of disease, training and education of staff and the advance of medical technologies can also contribute to the increase of outpatient morbidity and hospitalization, and to the decrease of mortality (8).

Conclusion

In order to improve the health of the population from the South Banat District, it is necessary to control health regularly and conduct screening programs for the early detection of CRC, which would contribute to the early detection of this disease in the population at risk. More intense promotion of health and healthy lifestyles can contribute to the reduction of known risk factors responsible for the occurrence of CRC in the population: poor nutrition (food rich in saturated fats, with the small intake of fibers), obesity, smoking, the existence of intestinal polyps, the lack of physical activity, etc.

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EPIDEMIOLOŠKE KARAKTERISTIKE I TREND KRETANJA POROĐAJA U SRBIJI

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SAŽETAK

Uvod/Cilj: U poslednjih nekoliko decenija pad stope fertiliteta je zabeležen u gotovo svim državama sveta. Cilj istraživanja je analiza epidemioloških karakteristika i trenda kretanja porođaja u Srbiji u periodu 2007-2016. godine.
Metode: Istraživanje je dizajnirano kao deskriptivna epidemiološka studija. Podaci su preuzeti iz Zdravstveno statističkih godišnjaka za period 2007-2016. godine. U analizi podataka korišćene su opšta stopa fertiliteta, stopa mortinataliteta, stopa rađanja, stopa mortaliteta odojčadi i stopa prevremenih porođaja, a trend stopa analiziran je korišćenjem jednačine linearnog trenda.
Rezultati: Prosečna stopa opšteg fertiliteta u Srbiji u periodu 2007-2016. godine je bila 1,5 deteta po ženi. U periodu 2007-2016. godine u Srbiji je registrovano 660.069 porođaja sa ukupno 671.715 rođene dece, od kojih je 4.054 mrtvorođeno (0,6%). Dve trećine (66,1%) mrtvorođene dece je bilo prevremeno rođeno. Sa starošću porodilja raste broj prevremenih porođaja. Od 667.661 živorođenih u porodilištima je umrlo 924 novorođenčadi (0,1%). U posmatranom periodu registruje se kontinuirani trend opadanja broja porođaja (y=68.427-439,99x, R^2=0,628), kao i broja živorođene dece (y=69.084-421,44x, R^2=0,591). Trend stopa mrtvorođenih (mortinataliteta) pokazuje neznatno opadanje (y=6,138-0,012x, R^2=0,016), kao i trend stopa mortaliteta novorođenčadi (y=1,882-50,091x, R^2=0,683), ali dolazi do porasta trenda opšte stope fertiliteta (y=39,481+0,242x, R^2=0,544). Prosečna opšta stopa fertiliteta za desetogodišnji period iznosila je 41,1 živorođenih na 1000 žena fertilnog perioda i kretala se od 38,2‰ do 41,7‰. Najveće povećanje stope fertilititeta beleži se u starosnoj grupi 40-44 godine sa 3,8‰ u 2007. godini na 9,9‰ u 2016. godini (2,6 puta više), a zatim u starosnoj grupi 30-39 godina sa 43,2‰ u 2007. godini na 63,0‰ u 2016. godini (1,4 puta više). Beleži se pad stope fertiliteta u starosnoj dobi 20-29 godina sa 80,4‰ u 2007. godini na 72,2‰ u 2016. godini. Najveće stope mrtvorođenosti (mortinataliteta) beleže se u najstarijoj grupi 45-49 godine (23,3‰), a najniža kod osoba mlađih od 15 godina (0,7‰).
Zaključak: Mere politike prema revitalizaciji rađanja moraju angažovati sve nivoe društva na izgradnji svesti i moralne odgovornosti prema fertilitetu.

Ključne reči: Deskriptivna studija, fertilitet, trend

Uvod

Prema definiciji Svetske zdravstvene organizacije (SZO), reproduktivno zdravlje predstavlja stanje fizičkog, mentalnog i socijalnog blagostanja u svim oblastima vezanim za reproduktivni sistem, u svim fazama života (1). To je složen koncept, koji obuhvata brojne aspekte pozitivnog zdravlja definisanog kao blagostanje u sferi seksualnih odnosa i planiranja porodice, u oblasti zaštite od neželjenih trudnoća, seksualno prenosivih bolesti, neplodnosti, kao i sve resurse kojima se ovo blagostanje podupire (2). Planiranje porodice predstavlja svesnu aktivnost individue i parova u reproduktivnoj životnoj dobi, kojom teže da regulišu broj i vremenski raspored rađanja, kao i da rode zdravo dete (3,4).

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EPIDEMIOLOGICAL CHARACTERISTICS AND TRENDS OF BIRTH MOVEMENTS IN SERBIA

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SUMMARY

Introduction/Aim: In recent decades, declines in fertility rates have been reported in almost every country in the world. The aim of the research is the analysis of epidemiological characteristics and childbirth trends in Serbia in the period 2007-2016.
Methods: The study was designed as a retrospective, descriptive, epidemiological study. The research data were collected from the Health Statistical Yearbooks of the Institute of Public Health of the Republic of Serbia "Dr Milan Jovanovic Batut" in the period 2007-2016. Total fertility rates, stillbirth rates, birth rates, infant mortality rates, and preterm birth rates were used for the analysis of data, while the linear trend and regression analysis were used to analyze the trend.
Results: Average rate of general fertility in Serbia in the period 2007-2016 was 1.5 children per woman. In the period 2007-2016, 660,069 births were registered in Serbia with a total of 671,715 children born, of which 4,054 were stillborn (0.6%). Two thirds (66.1%) of stillborn children were born prematurely. The number of premature births increased with maternal age. Of 667,661 live births in maternity hospitals, 924 newborns died (0.1%). In the observed period, a continuous trend of decreasing number of births was registered (y = 68,427-439.99x, R^2 = 0.628), as well as the number of live births (y = 69,084-421.44x, R^2 = 0.591). The trend of still birth rates showed a slight decrease (y = 6,138-0,012x, R^2 = 0,016), as well as the trend of infant mortality rates (y = 1,882-50,091x, R^2 = 0,683), but there came to an increase in the trend of the general fertility rate (y = 39.481 + 0.242x, R^2 = 0.544). The average general fertility rate for the ten-year period was 41.1 live births per 1000 women of the fertile period and ranged from 38.2‰ to 41.7‰. The largest increase in the fertility rate was registered in the age group 40-44 years from 3.8‰ in 2007 to 9.9‰ in 2016 (2.6 times more), and then in the age group 30-39 years with 43.2‰ in 2007 to 63.0 ‰ in 2016 (1.4 times more). There came to a decline in the fertility rate at the age of 20-29 from 80.4‰ in 2007 to 72.2 ‰ in 2016. The highest rates of stillbirth were registered in the oldest group of 45-49 years (23.3 ‰), and the lowest in persons younger than 15 years (0.7‰).
Conclusion: Birth revitalization policies must engage all levels of society to build awareness and moral responsibility for fertility.

Keywords: Descriptive study, fertility, trend

Introduction

According to the definition of the World Health Organization (WHO), reproductive health is a state of physical, mental, and social well-being in all matters relating to the reproductive system, at all stages of life (1). It is a complex concept, which includes numerous aspects of positive health, which is defined as the well-being in all spheres of life, including sexual relations, family planning, contraception, sexually transmitted infections, infertility, as well as all resources that support this well-being (2). Family planning is a conscious activity of individuals and couples in the reproductive life stage, which allows them to attain their desired number of children and to determine the time of

Fertilitet je najdinamičniji i najintrigantniji demografski fenomen, koji predstavlja učestalost rađanja žena starosti 15 do 49 godina (5). U poslednjih nekoliko decenija pad stope fertiliteta je zabeležen u gotovo svim državama sveta. Prema poslednjem izveštaju Populacionog odeljenja pri Ujedinjenim nacijama za period 2010-2015. godine, procenjeno je da više od 50% svetske populacije živi u državama sa niskim nivoom fertiliteta, gde žene rađaju u proseku manje od 2,1 deteta tokom reproduktivnog perioda. To uključuje sve evropske države i Severnu Ameriku, dvadeset država u Aziji, sedamnaest u Latinskoj Americi i na Karibima, tri u Okeaniji i jednu u Africi. Najniža stopa fertiliteta zabeležena je 2015. godine u Kini (1,2) gde je usledilo ukidanje „politike rađanja jednog deteta". U 2016. godini u 103 države stopa fertiliteta je bila ispod nivoa potrebnog za prostu reprodukciju stanovništva, od čega je u tridesetdve države bila ispod 1,5 deteta po ženi (3).

Cilj istraživanja je bio da se analiziraju epidemiološke karakteristike i trend kretanja porođaja u Srbiji u periodu 2007-2016. godine.

Metode

Istraživanje je dizajnirano kao deskriptivna epidemiološka studija. Podaci su preuzeti iz Zdravstveno statističkih godišnjaka Instituta za javno zdravlje Republike Srbije „Dr Milan Jovanović Batut" za period 2007-2016. godine. Analiziran je uzorak od 660.069 porođaja sa ukupno 671.715 rođene dece. Izvor ovih podataka je prijava rođenja. Na osnovu Zakona o zdravstvenoj dokumentaciji i evidencijama u oblasti zdravstva, zdravstvene ustanove, kao i sva druga pravna i fizička lica koja obavljaju zdravstvenu delatnost dužni su da vode medicinsku dokumentaciju i evidencije i da dostavljaju individualne, zbirne i periodične izveštaje nadležnom Institutu/Zavodu za javno zdravlje. Prijava rođenja služi za dokazivanje činjenice rođenja radi upisa u matičnu knjigu rođenih. Prijavu rođenja popunjava zdravstvena ustanova koja je po zakonu dužna da prijavi rođenje. U slučaju rođenja van zdravstvene ustanove prijavu rođenja popunjava lekar ili babica koji su sudelovali u porođaju. Prijava rođenja se popunjava u tri primerka, jedan zadržava zdravstvena ustanova, drugi se dostavlja matičnoj službi, a treći nadležnom Institutu/Zavodu za javno zdravlje.

U okviru ovog rada analizirani su sledeći podaci: broj porođaja, broj ukupno rođenih (živorođeni, mrtvorođeni), starost majke na rođenju deteta, ishod trudnoće, telesna masa na rođenju, komplikacije trudnoće i patološka stanja novorođene dece.

Za prikazivanje podataka korišćene su deskriptivne metode: tabeliranje i grafičko prikazivanje. U statističkoj obradi podataka korišćene su proporcije, opšte i uzrasno-specifične stope (opšta stopa fertiliteta, stopa mrtvorođenosti - mortinatalitet, stopa mortaliteta novorođenčadi, stopa rađanja, stopa prevremenih porođaja). Linearni trend i regresiona analiza korišćeni su za analizu trenda.

Opšta stopa fertiliteta je izračunata kao broj živorođene dece na 1000 žena fertilnog perioda (od 15-49 godine života). Stopa mrtvorođenja ili mortinataliteta je izračunata kao broj mrtvorođenih na 1000 živorođenih. Stopa rađanja se izračunava kao broj živorođenih na 1000 žena. Stopa mortaliteta novorođenčadi izračunava se kao broj umrle novorođenčadi na 1000 živorođenih. Stopa preveremenih porođaja je izračunata kao broj prevremenih porođaja na 100 živorođene dece.

Rezultati

U posmatranom periodu 2007-2016. godine u Srbiji je na osnovu prijava rođenja registrovano 660.069 porođaja sa ukupno 671.715 rođene dece, od kojih je 4.054 mrtvorođeno (0,6%). Od 667.661 živorođenih u porodilištima je umrlo 924 novorođenčadi (0,1%) (Tabela 1).

Najveći broj novorođenih je od strane majki uzrasta 20–29 godina (347,611; 51,7%) i uzrasta 30–39 godina (275,031; 40,9%), a najmanji uzrasta 50 i više godina (91; 0,01%). U starosnoj grupi ispod 15 godina registrovano je 450 novorođenih (0,06%). Najmanji broj mrtvorođenih prijavljen je kod majki mlađih od 15 godina (3), a najviše kod majki uzrasta 20 do 29 godina (1847).

U posmatranom periodu registruje se kontinuirani trend opadanja broja porođaja (y=68.427-439,99x, R^2=0,628), kao i broja živorođene dece (y=69.084-421,44x, R^2=0,591) (Grafikon 1). U 2016. godini, u odnosu na 2007. godinu, apsolutni broj porođaja je opao za

pregnancies, as well as to give birth to a healthy child (3,4).

Fertility is the most dynamic and most intriguing demographic phenomenon, which relates to the frequency of childbirth among women aged 15 to 49 years (5). In recent decades, a decline in fertility rates has been reported in almost every country in the world. According to the last report of the Population Division of the Department of the United Nations Secretariat for the period 2010-2015, it was estimated that more than 50% of the world population lived in countries with low levels of fertility, where fertility was below 2.1 births per woman during the reproductive period. It included all European countries and North America, twenty countries in Asia, seventeen in Latin America and the Caribbean, three in Oceania, and one in Africa. The lowest fertility rate was reported in China, in 2015 (1,2), where the abolition of the "one-child policy" followed. In 2016, in 103 countries, the fertility rate was below the level necessary for the simple reproduction of the population, while in thirty-two countries it was below 1.5 births per woman (3).

The aim of the research was to analyze the epidemiological characteristics and childbirth trends in Serbia in the period 2007-2016.

Methods

The research was designed as a descriptive epidemiological study. Data were taken from the Health Statistical Yearbooks of the Institute of Public Health of Serbia "Dr Milan Jovanovic Batut" for the period 2007-2016. The sample of 660.069 births was analyzed with a total of 671.715 children born. The source of these data was the Notification of birth. According to the Law on medical documentation and records in the field of health care, health care institutions, as well as other legal entities and natural persons, providers of health care services, are obliged to keep medical records and to submit individual, collective, periodical reports to the authorized Public Health Institute. The Notification of birth serves as the evidence of birth so that birth certificates can be obtained. The birth notification form is completed by the health care institutions, which are obliged to register the birth. When birth occurs outside healthcare facilities, the birth notification form is completed by a doctor or a midwife, who helped a woman during labor. The birth notification form is completed in three copies. One is kept by the healthcare institution, the second is sent to the registered office, while the third is sent to the authorized Public Health Institute.

In this study, the following data were analyzed: the number of births, the total number of children born (live births, stillbirths), age of mother at birth, the outcome of pregnancy, body weight at birth, complications of pregnancy, and pathological states of children born.

Descriptive methods were used to present data: tables and graphs. Proportions, general and age-specific rates were used in the statistical analysis of data (general fertility rate, stillbirth rates, infant mortality rate, birth rates, preterm birth rate). The linear trend and regression analysis were used for the trend analysis.

The total fertility rate was calculated as the number of live births per 1000 women in the reproductive period (aged 15-49). The stillbirth rate was calculated as the number of stillbirths per 1000 births. The birth rate was calculated as the number of live births per 1000 women. The infant mortality rate was calculated as the number of infant deaths per 1000 live births. The preterm birth rate was calculated as the number of preterm deliveries per 1000 live births.

Results

In the observed period from 2007 to 2016, in Serbia, there were 660.069 births registered with a total of 671.715 live births and 4.054 stillbirths (0.6%). Of 667.661 live births, 924 newborns died in maternity hospitals (0.1%) (Table 1).

The greatest number of live births was among mothers aged 20-29 (347.611; 51.7%) and among mothers aged 30-39 (275.031; 40.9%), while the smallest number was in the age group 50 and older (91; 0.01%). In the age group younger than 15, 450 newborn babies were registered (0.06%). The smallest number of stillbirths was reported in mothers younger than 15 (3), while the largest number was in mothers aged 20-29 years (1847).

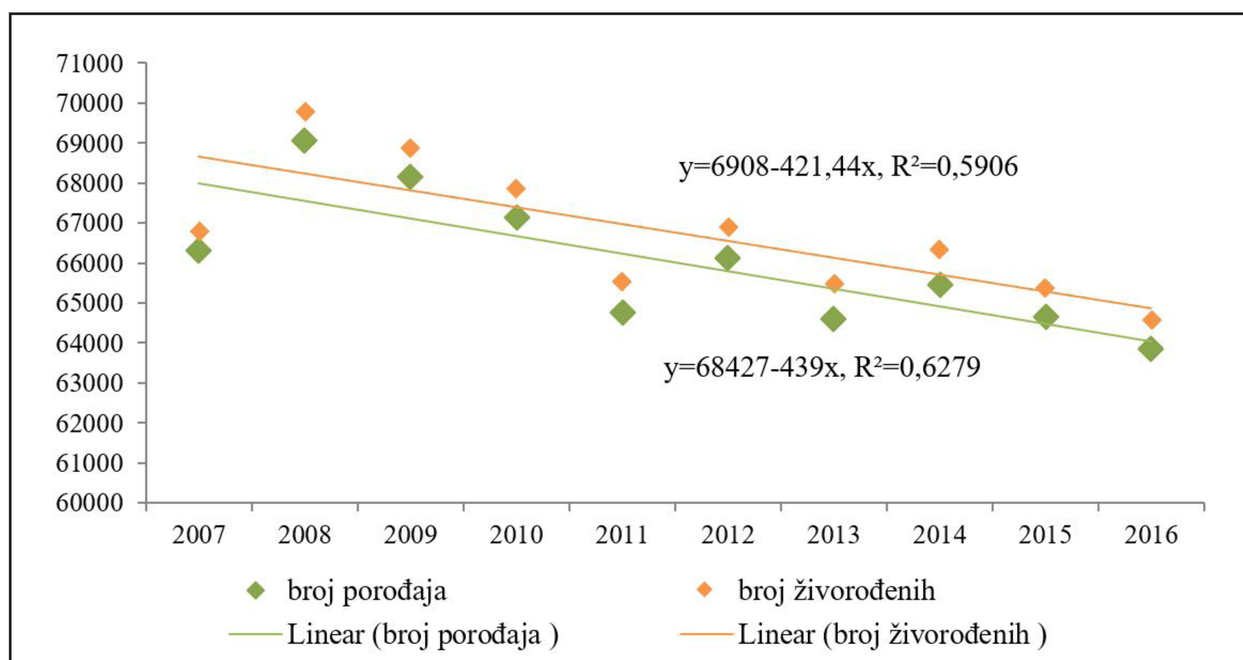
In the observed time period, the continuous trend of decrease in the number of births was registered ($y=68,427-439.99x$, $R^2=0.628$), as

Tabela 1. Broj novorođene dece prema starosti majke pri porođaju, Srbija, 2007-2016. godina

Starost majke		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Ukupno	%
Republika Srbija	Ukupno	67245	70201	69316	68312	65945	67330	65865	66711	65806	64984	671715	100.0
	Živorođeno	66826	69785	68896	67876	65558	66914	65502	66332	65385	64587	667661	99.4
	Mrtvorođeno	419	416	420	436	387	416	363	379	421	397	4054	0.6
<15	Ukupno	93	46	66	47	37	34	24	32	25	26	430	100.0
	Živorođeno	92	45	66	47	37	34	24	31	25	26	427	99.3
	Mrtvorođeno	1	1	0	0	0	0	0	1	0	0	3	0.7
15-19	Ukupno	4854	3761	3582	3359	3032	2910	2678	2642	2268	2169	31255	100.0
	Živorođeno	4823	3726	3551	3229	3013	2888	2656	2622	2244	2142	30894	98.8
	Mrtvorođeno	31	35	31	30	19	22	22	20	24	27	261	0.8
20-29	Ukupno	40043	40080	37646	36342	34058	34037	32551	32092	30726	30036	347611	100.0
	Živorođeno	39812	39885	37454	36138	33878	33843	32383	31930	30558	29883	345764	99.5
	Mrtvorođeno	231	195	192	204	180	194	168	162	168	153	1847	0.5
30-39	Ukupno	21276	24960	26574	26974	27184	28559	28754	29854	30503	30393	275031	100.0
	Živorođeno	21141	24797	26399	26794	27022	28374	28600	29679	30308	30207	273321	99.4
	Mrtvorođeno	135	163	175	180	162	185	154	175	195	186	1710	0.6
40-44	Ukupno	920	1261	1373	1472	1524	1664	1705	1928	2157	2233	16237	100.0
	Živorođeno	902	1241	1353	1453	1502	1650	1689	1908	2125	2205	16028	98.7
	Mrtvorođeno	18	20	20	19	22	14	16	20	32	28	209	1.3
45-49	Ukupno	53	87	69	110	103	119	139	144	120	112	1056	100.0
	Živorođeno	50	85	67	107	99	118	136	143	118	109	1032	97.7
	Mrtvorođeno	3	2	2	3	4	1	3	1	2	3	24	2.3
50+	Ukupno	2	6	6	8	7	7	14	19	7	15	91	100.0
	Živorođeno	2	6	6	8	7	7	14	19	7	15	91	100.0
	Mrtvorođeno	0	0	0	0	0	0	0	0	0	0	0	0

Table 1. Number of newborns by age of mother at birth, Serbia, 2007-2016

Mother's age		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Ukupno	%
Republic of Serbia	Total	67245	70201	69316	68312	65945	67330	65865	66711	65806	64984	671715	100.0
	Live birth	66826	69785	68896	67876	65558	66914	65502	66332	65385	64587	667661	99.4
	Stillbirth	419	416	420	436	387	416	363	379	421	397	4054	0.6
<15	Total	93	46	66	47	37	34	24	32	25	26	430	100.0
	Live birth	92	45	66	47	37	34	24	31	25	26	427	99.3
	Stillbirth	1	1	0	0	0	0	0	1	0	0	3	0.7
15-19	Total	4854	3761	3582	3359	3032	2910	2678	2642	2268	2169	31255	100.0
	Live birth	4823	3726	3551	3229	3013	2888	2656	2622	2244	2142	30894	98.8
	Stillbirth	31	35	31	30	19	22	22	20	24	27	261	0.8
20-29	Total	40043	40080	37646	36342	34058	34037	32551	32092	30726	30036	347611	100.0
	Live birth	39812	39885	37454	36138	33878	33843	32383	31930	30558	29883	345764	99.5
	Stillbirth	231	195	192	204	180	194	168	162	168	153	1847	0.5
30-39	Total	21276	24960	26574	26974	27184	28559	28754	29854	30503	30393	275031	100.0
	Live birth	21141	24797	26399	26794	27022	28374	28600	29679	30308	30207	273321	99.4
	Stillbirth	135	163	175	180	162	185	154	175	195	186	1710	0.6
40-44	Total	920	1261	1373	1472	1524	1664	1705	1928	2157	2233	16237	100.0
	Live birth	902	1241	1353	1453	1502	1650	1689	1908	2125	2205	16028	98.7
	Stillbirth	18	20	20	19	22	14	16	20	32	28	209	1.3
45-49	Total	53	87	69	110	103	119	139	144	120	112	1056	100.0
	Live birth	50	85	67	107	99	118	136	143	118	109	1032	97.7
	Stillbirth	3	2	2	3	4	1	3	1	2	3	24	2.3
50+	Total	2	6	6	8	7	7	14	19	7	15	91	100.0
	Live birth	2	6	6	8	7	7	14	19	7	15	91	100.0
	Stillbirth	0	0	0	0	0	0	0	0	0	0	0	0

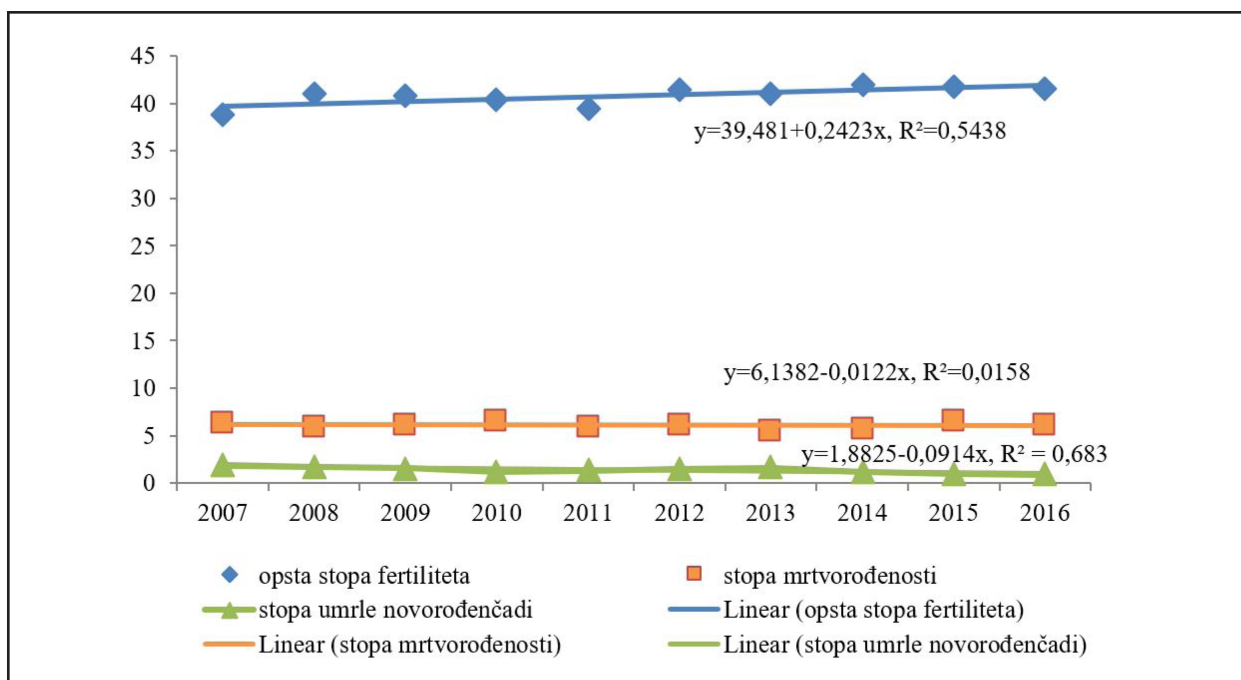


Grafikon 1. Trend broja porođaja i živorođenih u Srbiji, 2007-2016. godina

2462 porođaja, a broj živorođene dece za 2239. Najveći broj porođaja beleži se u 2008. godini (69.035 porođaja), a najmanji u 2016. godini (63.855 porođaja).

Trend stopa mrtvorođenih (mortinataliteta) pokazuje opadanje sa 6,3‰ u 2007. na 6,1‰ u 2016. godini (y=6,138-0,012x, R^2=0,016) (Grafikon 2). U Srbiji, prosečna stopa mrtvorođenih je iznosila 6,1‰ za period od 2007. do 2016. godine. Takođe se beleži značajan trend opadanja stope mortaliteta novorođenčadi (y=1,882-0,091x, R^2=0,683). Prosečna stopa mortaliteta novorođenčadi je iznosila 1,4‰ za period od 2007. do 2016. godine.

U Srbiji je prosečan broj živorođene dece, u posmatranom periodu, iznosio 1,5 deteta po ženi. Prosečna opšta stopa fertiliteta za desetogodišnji period iznosila je 40,8 živorođenih na 1000 žena fertilnog perioda i kretala se od 38,2‰ do 41,7‰. Takođe, u istom periodu dolazi do neznatnog trenda porasta opšte stope fertiliteta (y=39,481+0,242x, R^2=0,544).



Grafikon 2. Trend opšte stope fertiliteta (‰), stope mrvorođenja (mortinataliteta) (‰) i stope smrtnosti novorođenčadi (‰) u Srbiji za period 2007-2016. godine

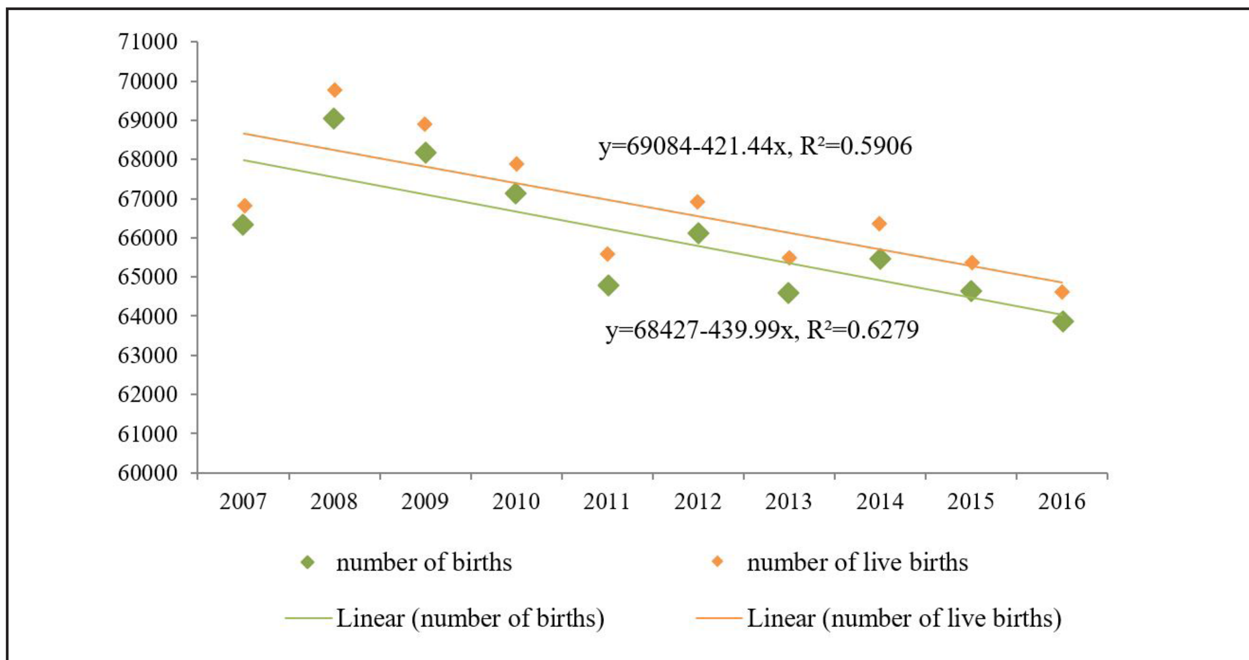


Figure 1. Trend in the number of births and live births in Serbia, for the period 2007-2016

well as in the number of live births (y=69,084-421,44x, R^2=0.591) (Figure 1). In 2016, in comparison to 2017, the absolute number of births decreased by 2462 births, while the number of live births was 2239. The largest number of births was recorded in 2008 (69,035 births), while the smallest was in 2016 (63,855).

The trend in stillbirth rates showed a decrease from 6.3‰ in 2017 to 6.1‰ in 2016 (y=6.138-0.012x, R^2=0.016) (Figure 2). In Serbia, the average rate of stillbirths amounted to 6.1‰ for the period 2007 to 2016. Also, a significant declining infant mortality rate was recorded (y=1.882-0.091x, R^2=0.683). In Serbia, the average infant mortality rate amounted to 1.4‰ for the period 2007-2016.

In Serbia, the average number of live births in the observed time period amounted to 1.5 children per one woman. The average general fertility rate for the ten-year period amounted to 40.8‰ and it ranged from 38.2‰ to 41.7‰. Also, in the same time period the trend in general fertility rate slightly increased (y=39.481+0.242x, R^2=0.544).

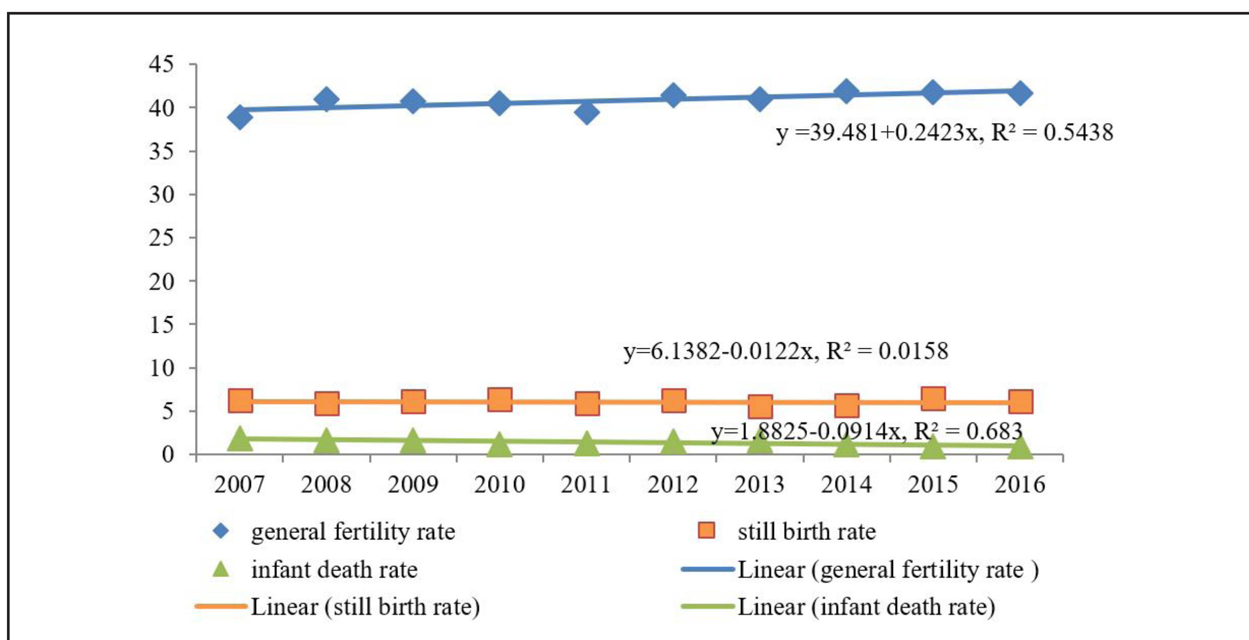
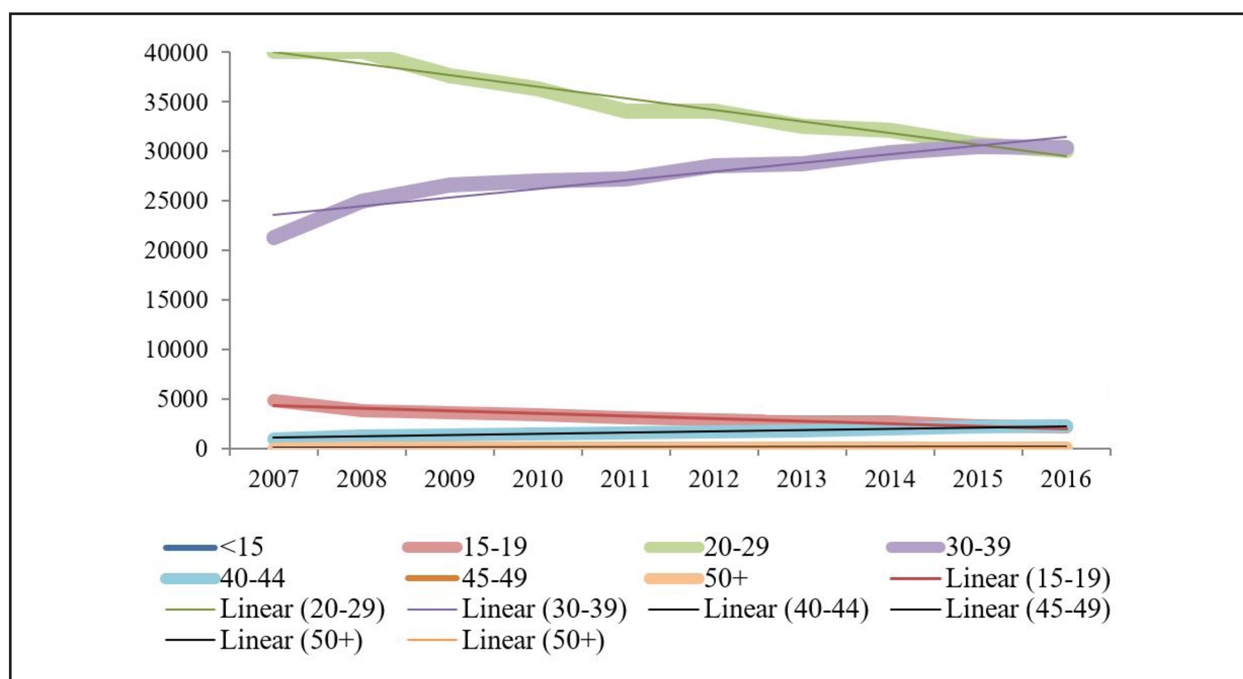


Figure 2. Trend in general fertility rate (‰), still birth rate (‰) and infant mortality rate (‰) in Serbia in the period 2007-2016



Grafikon 3. Trend broja porođaja u odnosu na starost majke pri porođaju u Srbiji, 2007-2016. godine

U Srbiji, u periodu 2007-2016. godine beleži se trend porasta broja porođaja u uzrasnoj grupi 30-39 godina (y=22.704+872,54x; R^2=0,872), 40-44 godine (y=900,27+131,53x, R^2=0,965) 45-49 godina (y=64,267+7,515x, R^2=0,622), 50 i više godina (y=2,2+1,254, R^2=0,539), dok se pad broja porođaja beleži u dobnoj grupi ispod 15 godina (y=75,4-5,945x, R^2=0,965), 15-19 godina (y=4508,2-251,4x, R^2=0,900) i u uzrasnoj grupi 20-29 godina (y=41.251-1180x, R^2=0,968) (Grafikon 3).

U periodu od 2007. do 2016. godine dolazi do porasta stope fertiliteta sa 39,1 na 41,9‰ (Tabela 2). Najveće povećanje stope fertilitita beleži se u starosnoj grupi 40-44 godine sa 3,8‰ u 2007. godini na 9,9‰ u 2016. godini (2,6 puta više), a zatim u starosnoj grupi 30-39 godina sa 43,2‰ u 2007. godini na 63,0‰ u 2016. godini (1,4 puta više). Beleži se pad stope fertiliteta u starosnoj dobi 20-29 godina sa 80,4‰ u 2007. godini na 72,2‰ u 2016. godini, 15-19 godina sa 22,3‰ žena u 2007. godini na 12,6‰ u 2016. godini i kod osoba mlađih od 15 godina, sa 0,17‰ na 0,05‰. Prosečna stopa fertiliteta za posmatrani period iznosila je 41,1‰, pri čemu je ova stopa bila najviša u starosnoj grupi 20-29 godina (75,3‰) i 30-39 godina (55,8‰), a najmanja u uzrastu 15-19 godina (15,8‰), 40-44 godina (6,8‰) i 45-49 godina (0,4‰).

Najveće stope mrtvorođenosti (mortinataliteta) beleže se u najstarijoj grupi 45-49 godine (23,3‰), a zatim u starosnoj grupi 40-44 (13,0‰). Najniže su kod osoba mlađih od 15 godina (0,7‰) i u uzrastu 20-29 godina (5,3‰) (Tabela 3).

Posmatrano prema ishodu trudnoće, od 671.715 rođene dece najviše porođaja 622.647 (92,6%) bilo je u terminu, a najmanje prevremenih (47.358 tj. 7,1%) i posle termina (158 tj. 0,02%) (Tabela 4). Dve trećine (66,1%) mrtvorođene dece je bilo prevremeno rođeno. U Srbiji se zapaža kontinuirani trend porasta stope prevremenih porođaja (y=0,206x+5,520; R^2=0,916). Prosečna stopa prevremenih porođaja na 100 živorođenih je 6,6 za posmatrani period, a kretala se od 5,5 do 7,3 na 100 živorođenih.

Sa starošću porodilja raste broj prevremenih porođaja pa se najveća stopa prevremenih porođaja beleži u najstarijoj dobnoj grupi 45-49 godina (24 prevremenih porođaja na 100 živorođenih), 40-44 godina (11,4 prevremenih porođaja na 100 živorođenih), a najmanje 20-29 godina (5,6 prevremenih porođaja na 100 živorođenih), 30-39 godina (7,4 prevremenih porođaja na 100 živorođenih), 15-19 godina (7,6 prevremenih porođaja na 100 živorođenih), i među mlađima od 15 godina (8,6 prevremenih porođaja na 100 živorođenih).

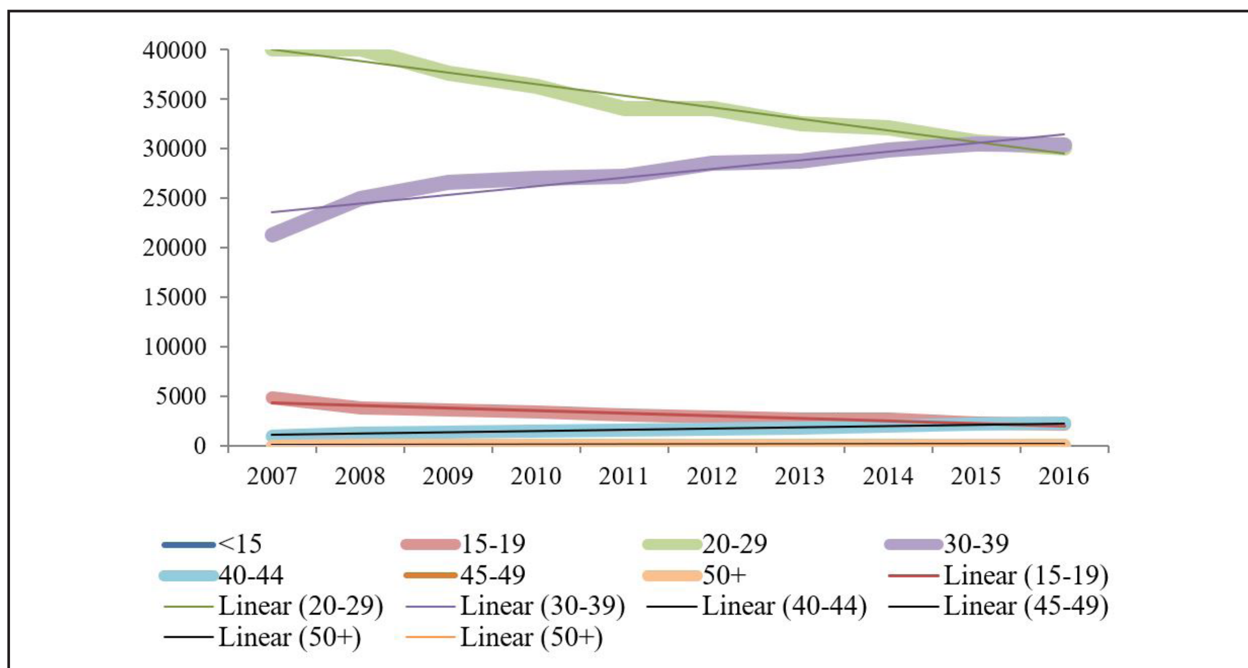


Figure 3. Trend in the number of births in relation to the age of mothers at the birth of a child, Serbia, 2007-2016

In Serbia, in the period 2007-2016, the increasing trend in the number of births increased in the age group 30-39 years (y=22.704+872.54x; R^2=0.872), 40-44 years (y=900.27+131.5x, R^2=0.965), 45-49 years (y=64.267+7.5152x, R^2=0.622), 50 years and older (y=2.2+1.2545x, R^2=0.539), whereas a decrease in the number of births was recorded in the age group younger than 15 (y=75.4-5.945x, R^2=0.965), 15-19 years (y=4508.2-251,4x, R^2=0.900) and in the age group 20-29 years (y=41.251-1180x, R^2=0.968) (Figure 3).

In the period 2007 to 2016, there came an increase in the fertility rate from 39.1‰ to 41.9‰ (Table 2). The greatest increase in the fertility rate was recorded in the age group 40-44 years from 3.8‰ in 2007 to 9.9‰ in 2016 (2.6 times more), and then in the age group 30-39 from 43.2‰ in 2007 to 63.0‰ in 2016 (1.4 times more). A decrease in the fertility rate was noted in the age group 20 to 29 years from 80.4‰ in 2007 to 72.2‰ in 2016, 15-19 years from 22.3‰ women in 2007 to 12.6‰ in 2016, as well as in women younger than 15, from 0.17‰ to 0.05‰. The average fertility rate for the observed time period amounted to 41.1 live births per 1000 women in the fertile period, while this rate was the highest in the age group 20-29 years (75.3‰) and 30-39 years (55.8‰), and the lowest in the age group 15 to 19 years (15.8‰), 40-44 years (6.8‰) and 45-49 years (0.4‰).

The largest stillbirth rates were recorded in the oldest group 45-49 years (23.3‰), and then in the age group 40-44 years (13.0‰). The lowest rates were in persons younger than 15 years (0.7‰) and in the age group 20-29 years (5.3‰) (Table 3).

As far as the outcome of pregnancy is concerned, of 671.715 children born, most deliveries were in term (622.647, that is, 92.6%), while 47.358 (7.1%) were preterm and 158 (0.02%) were after the term (Table 4). Two-thirds of stillborn children (66.1%) were born prematurely. In Serbia, the continuous increasing trend of preterm birth rates was noticed (y=5.520+0.206x; R^2=0.916). The average preterm birth rate per 100 live births was 6.6 for the observed time period, and it ranged from 5.5 to 7.3 per 100 live births.

The preterm birth rate increased with maternal age, and therefore, the largest rate of preterm deliveries was noted in the oldest age group 45-49 years (24 preterm births per 100 live births), 40-44 years (11.4 preterm births per 100 live births), while the lowest rate was in the age group 20-29 (5.6 preterm births per 100 live births), 30-39 years (7.4 preterm births per 100 live births), 15-19 years (7.6 preterm births per 100 live births), and in the age group

Tabela 2. Specifične stope fertiliteta (‰), Srbija, 2007-2016.

Starost majke	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2007-2016
<15	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15-19	22.3	17.7	17.2	16.3	14.9	15.0	14.2	14.5	12.9	12.6	15.8
20-29	80.4	81.3	77.4	73.1	72.2	75.7	73.8	74.3	72.5	72.2	75.3
30-39	43.2	50.4	53.4	53.9	54.0	58.0	58.6	60.9	62.5	63.0	55.8
40-44	3.8	5.2	5.7	6.1	6.4	7.1	7.2	8.1	8.9	9.9	6.8
45-49	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.5	0.5	0.4
0-49	39.1	41.2	41.0	40.7	39.7	41.6	41.2	42.2	42.0	41.9	41.1

Diskusija

Rezultati ovog istraživanja su pokazali da se u Srbiji beleži kontinuirani trend opadanja broja porođaja i živorođene dece. Prosečan broj živorođene dece u Srbiji je 1,5 dece po ženi, što je za trećinu manje od nivoa potrebnog za prostu reprodukciju koji predviđa 2,1 živorođenje (6).

Fenomen nedovoljnog rađanja dece je duboko uslovljen proces koji nije uspelo da izbegne nijedno razvijeno društvo. Nedovoljno rađanje dece nije realnost samo u razvijenim zemljama niti isključivo zapadne civilizacije, budući da se, prema proceni Ujedinjenih nacija, sa ovim fenomenom danas suočava više od 50% svetske populacije uključujući ceo evropski kontinent, ali i neke od najmnogoljudnijih zemalja – Kinu, SAD, Brazil, Rusiju, Japan, Vijetnam, Nemačku, Iran, Tajland i Veliku Britaniju. Pritom su neke od ovih država sve do nedavno bile sinonim veoma visokog fertiliteta (7,8). Prosečan broj živorođene dece po ženi na globalnom nivou je u periodu od 1950. do 2009. godine prepolovljen sa 5 na 2,5. U 2015. godini, nivo fertiliteta je na nivou proste reprodukcije i predviđa se da će se pad nastaviti i tokom narednih godina do 2050. godine, mada smanjenom brzinom. U Africi je fertilitet još uvek veoma visok (4,4) (9).

Od visokofertilitetnog područja, Srbija je postala niskofertilitetna, i to mnogo brže nego druge evropske zemlje, mada unutar nje još uvek postoje regionalne diferencijacije plodnosti (10). Od 1950, kada su žene u proseku rađale 3,1 dete, do 2011. broj dece je redukovan na 1,4, što je odličan pokazatelj promena u reproduktivnim normama i ponašanju stanovništva Srbije, ali i teške društveno-ekonomske situacije (11). Prema poslednje dostupnim podacima, koji se odnose na 2016. godinu, prosečan broj živorođene dece po ženi u Republici Srbiji iznosi 1,46, što je ispod evropskog proseka, koji iznosi 1,58 deteta po ženi (12). Drugim rečima, nivo rađanja je u kontinuitetu od 1999. čak za 30% niži od nivoa potrebnog za prostu reprodukciju stanovništva, kada se Republika Srbija posmatra kao celina, što znači da će generacije žena koje budu rađale u periodu 2017-2034. godine biti

Tabela 3. Specifične stope mrtvorođenosti (‰), Srbija, 2007-2016. godine

Starost majke	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2007-2016
<15	1.1	2.2	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.7
15-19	6.4	9.4	8.7	9.3	6.3	7.6	8.3	7.6	10.7	12.6	8.4
20-29	5.8	4.9	5.1	5.6	5.3	5.7	5.2	5.1	5.5	5.1	5.3
30-39	6.4	6.6	6.6	6.7	6.0	6.5	5.4	5.9	6.4	6.2	6.3
40-44	20.0	16.1	14.8	13.1	14.6	8.5	9.5	10.5	15.1	12.7	13.0
45-49	60.0	23.5	29.9	28.0	40.4	8.5	22.1	7.0	16.9	27.5	23.3
0-49	60.0	23.5	29.9	28.0	40.4	8.5	22.1	7.0	16.9	27.5	23.3

Table 2. Specific birth rates (‰), Serbia, 2007-2016.

Starost majke	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2007-2016
<15	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15-19	22.3	17.7	17.2	16.3	14.9	15.0	14.2	14.5	12.9	12.6	15.8
20-29	80.4	81.3	77.4	73.1	72.2	75.7	73.8	74.3	72.5	72.2	75.3
30-39	43.2	50.4	53.4	53.9	54.0	58.0	58.6	60.9	62.5	63.0	55.8
40-44	3.8	5.2	5.7	6.1	6.4	7.1	7.2	8.1	8.9	9.9	6.8
45-49	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.5	0.5	0.4
0-49	39.1	41.2	41.0	40.7	39.7	41.6	41.2	42.2	42.0	41.9	41.1

younger than 15 (8.6 preterm births per 100 live births).

Discussion

The results of this research showed a continuous declining trend in the number of births and live births. The average number of live births in Serbia was 1.5 children per one woman, which is for one third less than the level necessary for simple reproduction which predicts 2.1 live births (6).

The phenomenon of an insufficient number of births is a deeply conditional process, which could not be avoided in developed countries. The insufficient number of births is not reality only in developed countries and solely in the Western civilization because, according to the estimates of the United Nations, more than 50% of the world population is faced with this phenomenon, including the whole European continent, as well as some of the countries with largest population numbers – China, USA, Brazil, Russia, Japan, Vietnam, Germany, Iran, Thailand, and Great Britain. Some of these countries have been the synonym of high fertility until recently (7,8). The average number of live births per woman at the global level decreased twofold from 5 to 2.5 between 1950 and 2009. In 2015, the level of fertility was at the level of simple reproduction and the estimates were made that it would continue to fall in the following years, until 2050, although at a slower pace. In Africa, fertility is still very high (4,4) (9).

Serbia had been a region with high fertility rates, however, it became a country with low fertility rates much faster than other European countries, although there are some regional differences regarding fertility (10). Since 1950, when women gave birth to 3.1 children on average, the number of children was reduced to 1.4 in 2011, which is an excellent sign of changes in relation to reproductive norms and ways of behaving in Serbia, as well as difficult socio-economic situation (11). According to the last available data, which relate to the year 2016, the average number of live births in Serbia per

Table 3. Specific still birth rates (‰), Serbia, 2007-2016.

Mother's age	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2007-2016
<15	1.1	2.2	0.0	0.0	0.0	0.0	0.0	3.2	0.0	0.0	0.7
15-19	6.4	9.4	8.7	9.3	6.3	7.6	8.3	7.6	10.7	12.6	8.4
20-29	5.8	4.9	5.1	5.6	5.3	5.7	5.2	5.1	5.5	5.1	5.3
30-39	6.4	6.6	6.6	6.7	6.0	6.5	5.4	5.9	6.4	6.2	6.3
40-44	20.0	16.1	14.8	13.1	14.6	8.5	9.5	10.5	15.1	12.7	13.0
45-49	60.0	23.5	29.9	28.0	40.4	8.5	22.1	7.0	16.9	27.5	23.3
0-49	60.0	23.5	29.9	28.0	40.4	8.5	22.1	7.0	16.9	27.5	23.3

Tabela 4. Rođena deca prema terminu porođaja, Srbija, 2007-2016. godine

Novorođeni	Termin porođaja			
	Prevremeni Broj (%)	U terminu Broj (%)	Posle termina Broj (%)	Ukupno Broj (%)
Ukupno rođeni	47,358 (7.1)	622,647 (92.7)	158 (0.02)	671,715 (100)
Živorođeni	41,677 (6.2)	621,341 (99.8)	156 (0.02)	667,661 (100)
Mrtvorođeni	2,681 (66.1)	1,306 (32.3)	2 (0.05)	4,054 (100)

gotovo za trećinu manje u odnosu na generacije koje su rađale u periodu 1999-2016. godine (12).

Promenu obrazaca u reproduktivnom ponašanju usmerenih ka prihvatanju niskih reproduktivnih normi uslovljava veći broj činilaca različite vrste: društveni, ekonomski, politički, demografski, kulturno-psihološki faktori, kao i grupa socijalnih i individualnih normi nastalih u sferi promenjenih uslova života, a manifestovanih kroz odlaganje rađanja u optimalnoj životnoj dobi i sve nižu stopu ukupnog fertiliteta (13-15).

Kako je najveći udeo fertiliteta ostvarivan u okviru braka, pad univerzalnosti braka, porast stope divorcijaliteta i alternativne forme zajedništva doveli su neminovno i do rađanja koje je ispod nivoa potrebnog za stacionarni model stanovništva. U svetlu globalizacije i nastalih promena u savremenom društvu, uočava se sve veći broj partnera koji ne žele da imaju decu.

Ubrzana modernizacija, migracije iz ruralnih u urbana područja, visoko učešće žena u radnoj snazi sa punim radnim vremenom, nezaposlenost, nezadovoljavajući ekonomski standard, neadekvatna podrška u vezi sa usklađivanjem obaveza na poslu i u porodici, problemi čuvanja dece, kontrola rađanja, nedovoljna materijalna podrška porodicama sa decom samo su neki od faktora nedovoljnog rađanja dece (16-18).

Rezultati istraživanja su pokazali da je došlo do promena u starosnom obrascu rađanja, odnosno pomeranja rađanja iz mlađih starosnih grupa žena ka starijim. Sve manji broj žena se odlučuje za rađanje u dobi optimalnoj za rađanje, prema biološkim i medicinskim kriterijumima. Došlo je do porasta prosečne starosti majke pri rođenju deteta sa 25,9 godina u 1991. na 29,6 godina u 2016. godini (19). Odlaganje rađanja predstavlja zajedničku karakteristiku savremenog društva i jednu od glavnih odlika druge demografske tranzicije čije su glavne odlike porast rađanja nakon 30 godine i najviše stope rađanja između 25-29 i 30-34 godine starosti. Međutim, pojava odlaganja rađanja ne mora nužno voditi ka niskoj ili veoma niskoj stopi ukupnog fertiliteta, što potvrđuju primeri Irske, Švedske, Norveške ili Danske, kod kojih je prosečna starost majke pri rođenju deteta viša za 1,5-2 godine nego u Srbiji (20). Predominantan uticaj na odlaganje formiranja porodice i rađanja dece, u većini evropskih zemalja, ima faktor tercijarnog obrazovanja, pozicioniranja na poslu, stabilnost na poslu, što predstavlja obezbeđenje relativno zadovoljavajućeg životnog standarda (21,22).

Rezultati ovog istraživanja pokazali su da prevremeni porođaji čine 7,1% od ukupnog broja porođaja, sa prosečnom stopom od 6,6/100 živorođenih i beleži se kontinuirani trend porasta stope prevremenih porođaja. Najčešći su kod trudnica između 40–50 godina starosti, pa kod trudnica mlađih od 15 godina. Prema podacima SZO iz preko 180 zemalja, stopa prevremenog porođaja kreće se od 5% do 18% živorođenih beba. Više od 60% prevremenih porođaja javlja se u Africi i Južnoj Aziji. Posmatrano prema ishodu trudnoće, najveći broj mrtvorođene dece nalazimo u grupi prevremenih porođaja (66%). Slične rezultate nalazimo i u drugim studijama koje ukazuju da deca iz preterminskih porođaja čine oko 70% ukupnog mortaliteta novorođenčadi (23).

Rezultati ovog istraživanja su pokazali da se beleži trend opadanja porođaja kod adolescentkinja ispod 19 godina, što je svakako pozitivno ukoliko se zna da trudnoća i rađanje

Table 4. Children born by pregnancy outcome, Serbia, 2007-2016

Newborns	Births			
	Premature No (%)	In term No (%)	After term No (%)	Total No (%)
Total births	47,358 (7.1)	622,647 (92.7)	158 (0.02)	671,715 (100)
Live births	41,677 (6.2)	621,341 (99.8)	156 (0.02)	667,661 (100)
Stillbirths	2,681 (66.1)	1,306 (32.3)	2 (0.05)	4,054 (100)

one woman amounted to 1.46, which is lower than the European average, which amounted to 1.58 children per one woman (12). In other words, since 1999 the level of births has been continuously 30% lower than the level necessary for the simple reproduction of the population when The Republic of Serbia is observed as a whole. This means that generations of women, who will give birth between 2017 and 2034, will be one-third smaller in comparison to generations, which were born between 1999 and 2016 (12).

The change of pattern regarding the reproductive behavior directed towards the acceptance of low reproductive norms is conditioned by the greater number of different factors: social, economic, political, demographic, cultural-psychological, as well as groups of social and individual norms that appeared in the area of changed living conditions, and that were manifested through the postponement of pregnancies in the optimal life age and the lower rate of the total fertility (13-15).

Since the majority of women gave birth in marriage, the decrease in the number of marriages, as well as the increase in divorce rates and alternative forms of community and fellowship have inevitably led to the number of births that are below the level necessary for the stationary model of the population. In light of globalization and changes in contemporary society, it has been noticed that more and more couples do not want to have children.

Rapid modernization, migrations from rural to urban regions, a high percentage of women who have full-time jobs, unemployment, unsatisfactory economic standard, inadequate support in relation to all duties at work and in the family, problems that appear in relation to taking care of children, birth control, insufficient material support to families with children are only some of the factors relating to the insufficient number of births (16-18).

The results of the research showed that there came to the age-related changes, that is, to the postponement of birth from younger age groups to older ones. Fewer and fewer women decide to give birth to children at life stages which are optimal for that, according to biological and medical criteria.

There came to an increase in the general age of mothers at birth from 25.9 years in 1991 to 29.6 years in 2016 (19). The postponement of birth is the common characteristic of contemporary society and it is one of the main characteristics of the second demographic transition, whose main traits are the increase in births after 30 years and the highest birth rates in the age groups 25-29 and 30-34. However, the occurrence of the postponement of birth does not necessarily have to lead to a low or very low rate of total fertility, which is confirmed by the examples of Sweden, Norway, or Denmark, where the average age of mothers at birth is higher for 1.5-2 years than in Serbia (20). The factors of tertiary education, positioning at work, stability at work that secures the relatively satisfactory life standard have the predominant influence on the postponement of family planning and birth in the majority of European countries (21, 22).

The results of this research showed that preterm births made 7.1% of all births, with an average rate of 6.6/100 live births, and the continuing trend in the increase in the preterm birth rates was noted. They were the most frequent in pregnant women aged 40 to 50 years, and then in pregnant women younger than 15. According to the data of the World Health

u adolescenciji nose odgovarajuće rizike. Komplikacije zbog trudnoće i porođaja su glavni uzrok smrti žena starosne grupe 15-19 godina. Rizik od smrtnog ishoda dece do 5 godina takođe je za 28% veći kod dece koju su rodile majke adolescenti (24). Niske reproduktivne norme su duboko uslovljene i pripadaju kategoriji dugoročnih fenomena, i stoga se nameće potreba njihovog kontinuiranog praćenja, u različitim uslovima i sredinama, što će omogućiti kompleksnije zaključke i definisanje opštih i specifičnih ciljeva i mera populacione politike u budućnosti (25).

Zaključak

Na osnovu svih dobijenih rezultata istraživanja može se zaključiti da postoji trend opadanja broja porođaja u Srbiji. Zbog kompleksnosti problema, mere populacione politike moraju biti usmerene na politiku podsticanja rađanja, politiku prema migracijama, politiku u vezi procesa starenja, prema programima planiranja porodice i prema programima u sistemu zdravstvene zaštite sa ciljem očuvanja i unapređenja očuvanju i unapređenju reproduktivnog zdravlja žena.

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Organization from more than 180 countries, the preterm birth rate ranged from 5% to 18% of live births. More than 60% of preterm births occurred in Africa and South Asia. As far as the outcome of pregnancy is concerned, the largest number of stillbirths was in the group of preterm births (66%). Similar results were found in other studies that pointed to the fact that children from preterm deliveries accounted for 70% of the total mortality of newborns (23).

The results of this research showed a declining trend of births in adolescents younger than 19 years, which is certainly positive if we take into account the fact that pregnancy and births in adolescence bear certain risks. Complications during pregnancy and delivery are the main reason for deaths in women aged 15-19 years. The risk of the deathly outcome in children younger than five is 28% higher in children born by mothers of the adolescent age (24). Low reproductive norms are deeply conditioned and belong to the category of long-term phenomena, and therefore, there is a need to observe them continuously in different conditions and environments, which would enable more complex conclusions and define of general and specific aims and measures of population policy in the future (25).

Conclusion

According to the obtained results of this research, it can be concluded that the trend in the number of births has decreased in Serbia. Due to the problem's complexity, the measures of population policy have to be directed towards the policy of supporting birth, policy towards migrations, policy regarding the aging process, towards family planning programs, and towards programs within the system of healthcare aimed at preserving and improving the women's reproductive health.

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ZNAČAJ BALNEOTERAPIJE U REDUKCIJI BOLA STARIJIH PACIJENATA SA CERVIKALNIM SINDROMOM

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SAŽETAK

Uvod/Cilj: Bol u vratnom delu kičme je jedan od najčeščih muskuloskeletnih bolova koji se javlja kod 2/3 svetske populacije, bilo kada u toku života. On može biti povezan sa degenerativnim promenama, psihosocijalnim faktorima, sedentarnim načinom života, smanjenom fizičkom aktivnošću i stresom. Cilj ove studije je da se ispita značaj balneoterapije u redukciji bola kod starijih osoba sa umereno jakim bolom usled cervikalnog sindroma.
Metode: U ovu panel studiju je uključeno deset muškaraca i 52 žene uzrasta od 61 do 80 godina sa umereno jakim bolom usled cervikalnog sindroma, a koji nisu imali kontraindikaciju za primenu balneološke i kineziterapije. Vizuelna analogna skala (VAS) je korišćena za merenje inteziteta bola pre i posle balneoterapije i kineziterapije.
Rezultati: Između muškaraca i žena nije bilo značajnih razlika u odnosu na uzrast i propagaciju cervikalnog bola. Posle deset dana terapije, kod oko jedne trećine ispitanika koji su imali umereno jak cervikalni bol posle korišćenja termomineralne kupke sa i bez vežbanja došlo je do prestanka bola. Kod svakog drugog ispitanika sa umereno jakim intezitom cervikalnog bola došlo je do nestanka bola posle deset dana od korišćenja termomineralne kupke do ⅔ kade, a kod ⅓ ispitanika posle korišćenja termonimenalnog bazena i vežbi. Značajno bolji efekat u eliminisanju bola je bio posle korišćenja termominiralne kupke sa vodom do ⅔ kade ($p = 0.001$) i termomineralnog bazena sa vežbama ($p = 0.009$), nego posle termomineralne kupke sa vodom do ½ kade. Nije utvrđeno da postoji značajna razlika u redukciji cervikalnog bola posle primene termomineralne kupke do ⅔ vode u kadi i korišćenja termomineralnog bazena sa vežbama.
Zaključak: Balneoterapija zauzima veoma važno mesto u redukciji bola kod starijih osoba sa srednje jakim intezitetom bola uzrokovanim cervikalnim sindromom. Neophodna su dalja detaljnija istraživanja značaja balneoterapije i kineziterapije za redukciju bola kod cervikalnog sindroma pogotovo ako se ima u vidu činjenica da dolazi do starenja populacije.

Ključne reči: Cervikalni sindrom, balneoterapija, umereno jak bol

Uvod

Istraživanja ukazuju da balneološka terapija zauzima veoma važno mesto u lečenju pacijenata sa cervikalnim sindromom (1). Balneoterapija je jedna od najstarijih terapijskih procedura. Prirodna mineralna voda je voda koja potiče iz podzemnog sloja i izbija na površinu iz jednog ili više izvora, a koja se odlikuje karakterističnim organoleptičkim osobinama i fizičko hemijskim sastavom, a sadrži najmanje 1000 mg/l čvrstih rastvorenih sastojaka i najviše 4 g/l CO_2. Prirodne mineralne vode predstavljaju posebnu grupu podzemnih voda. Zahvaljujući fizičko hemijskim osobinama povoljno deluju na ljudski organizam, koriste se za profilaksu i lečenje. Mineralna voda treba da ima stalnu temperaturu iznad 20°C, da sadrži više od jednog grama čvrstih supstanci na 1 litar vode, sa predominacijom katjona: Na^+, Ca^{++}, Mg^{++}, i anjona: HCO_3^-, Cl^-, SO_4^{--}. Od rastvorenih gasova koje nalazimo u mineralnim vodama, za balneologiju najveći značaj imaju: ugljendioksid, vodoniksulfid, odnosno hidrosulfidni joni (2).

Termomineralna voda Banje Vrućice (Bosna i Hercegovina) je visoko mineralna i ugljeno-kisela, nema neprijatan miris jer u svom sastavu ne sadrži sumpor (1). Koristi se za pijenje, kupanje u kadama, hidroterapiju u bazenu, inhalaciju aerosola i ugljendioksida za gasne kupke. Termomineralne vode imaju mehanički,

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THE SIGNIFICANCE OF BALNEOTHERAPY FOR THE REDUCTION OF PAIN IN ELDERLY PATIENTS WITH THE CERVICAL SYNDROME

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SUMMARY

Introduction/Aim: Neck pain is one of the most common musculoskeletal conditions, which is experienced by two thirds of world population at some stage in life. It can be associated with degenerative changes, psychosocial factors, sedentary way of life, reduced physical activity and stress. The aim of this study is to examine the significance of balneotherapy for the reduction of pain in elderly persons with moderately severe pain caused by cervical syndrome.
Methods: Ten men and fifty-two women aged 61 to 80 years, who experienced a moderately severe pain caused by the cervical syndrome and who did not have contraindications for the application of balneotherapy and kinesitherapy, were included in this panel study. A Visual Analogue Scale (VAS) was used to measure the intensity of pain before and after balneotherapy and kinesitherapy.
Results: There was no significant difference between men and women regarding age and propagation of cervical pain. After ten days of therapy, the pain stopped in around one-third of examinees, who experienced a moderately severe cervical pain and who used the thermal mineral bath with and without exercises. In every other examinee with the moderately severe intensity of cervical pain, this pain stopped after ten days of using thermal mineral water that reached ⅔ of the bathtub, and in one-third of examinees who used the thermal mineral pool and who exercised. A significantly better effect in pain elimination was achieved after the thermal mineral bath with water that filled ⅔ of the bathtub ($p = 0.001$) and the thermal mineral pool with exercises ($p = 0.009$) than after themal mineral bath with water that filled ½ of the bathtub. It was not determined whether there was a significant difference regarding the reduction of cervical pain after the application of thermal mineral bath with ⅔ of water in the bathtub and after the use of the thermo-mineral pool with exercises.
Conclusion: Balneotherapy takes an important place in the reduction of pain in elderly persons with a moderately severe pain caused by the cervical syndrome. However, more detailed research is needed to explore the significance of balneotherapy and kinesitherapy for the reduction of pain caused by cervical syndrome, especially if population aging is taken into consideration.

Keywords: cervical syndrome, balneotherapy, moderately severe pain

Intoduction

Research studies have shown that balneotherapy takes an important place in the treatment of patients with cervical syndrome (1). Balneotherapy is one of the oldest therapeutic procedures. Natural mineral water originates from the underground layer and it emerges onto the land surface from one or more springs. It is characterized by specific organoleptic properties, as well as physical and chemical composition and it contains at least 1000 mg/l of dissolved solids and no more than 4g/l of CO2. Natural mineral waters present a special group of underground waters. Thanks to their physical-chemical properties, they have a positive influence on the human body and they are used in prophylaxis and treatment. Mineral water has a constant temperature above 20°C, contains more than one gram of solid substances per one liter of water, with the predominance of the following cations: Na^{+}, Ca^{++}, Mg^{++}, and the following anions: HCO_3^{-}, Cl^{-}, $SO4^{--}$. Of all dissolved gases that are found in mineral waters, for balneology, the most significant ones are the following: carbon dioxide, hydrogen sulfide, that is, hydrosulfide ions (2).

termalni i hemijski efekat. Mehanički efekat se odnosi na aktivno potpomognute vežbe u kadama ili bazenima. Kada je u pitanju termalni efekat, vežbe koje se rade u vodi dosta su olakšane i samim tim lakše se postižu pokreti kod određenih oštećenja zglobova. Ugljendioksid iz vode prodire u kožu i hemijskim putem draži završetke termoreceptora u samoj koži. Ova draž izaziva refleksnim putem vazodilataciju na periferiji, što je značajno za primenu kod oboljenja krvnih sudova gde je toplota kontraindikovana (2). Uglendioksid snižava tonus arterija i povećava tonus venskih sudova i na taj način smanjuje periferni otpor u arterijskom sistemu, samim tim srce olakšano radi, tj. dolazi do lakše preraspodele krvi u organizmu. Sistola se pojačava, a dijastola produžava, pri čemu se srce odmara uz poboljšanje koronarnog krvotoka i metabolizma u srčanom mišiću. Ugljendioksid svojim pozitivnim dejstvom na centar za disanje dovodi do produbljivanja disanja i povećanja ventilacije pluća. Takođe, termomineralna voda, svojim termičkim i mehaničkim dejstvom ublažava spazam mišića i stišava bolove, čime se postiže poboljšanje pokretljivosti ekstremiteta, odnosno kičmenog stuba. Bitno je naglasiti da termomineralna voda ima povoljan uticaj i na bolesti koštano-zglobnog sistema, stanja posle velikih ortopedskih operacija i traumatskih povreda i paralize perifernih živaca.

Nema apsolutne kontraindikacije za primenu ove vode, a relativne kontraindikacije mogu biti srčana dekompenzacija, aktivna tuberkuloza, febrilna stanja i maligni poremećaji srčanog ritma (2). U dugoj tradiciji primene termalnih voda sačinjeni su i protokoli o načinu primene termalne vode, količine pijenja, trajanju same procedure, i ukupnom trajanju banjskog lečenja (3).

Cilj ove studije je da se ispita značaj balneoterapije u redukciji bola kod starijih osoba sa cervikalnim sindromom lečenih u Zdravstveno-turističkom centru Banja Vrućica.

Metode

Istraživanje je sprovedeno u Zdravstveno turističkom centru Banja Vrućica u Tesliću, u periodu od 1. oktobra 2018. godine do 11. oktobra 2018. godine. U ovom periodu kod 75 pacijenata, uzrasta od 61 do 80 godina života, dijagnostifikovan je cervikalni sindrom na osnovu kliničkog pregleda i radiološkim metodama (tomografija, CT). U cilju sagledavanja značaja baleneoterapije u redukciji bola isključene su sve one osobe kojima je bilo kontraindikovano korišćenje ove terapije (jedan muškarac i 12 žena, jer su bili srčano dekompenzovani ili sa poremećajem srčanog ritma) i koje su koristile analgetike. U studiju su uključene sve one osobe koje su imale umereno jak bol (intezitet bola od 4 do 6 na vizuelno analognoj skali).

Sve osobe sa cervikalnim sindromom lečene su jednom od sledećih balneoloških procedura: termomineralne kupke kada su kade napunjene termomineralnom vodom do polovine, termomineralne kupke kada su kade napunjene termomineralnom vodom do dve trećine kade, ili u termalnom bazenu sa vežbama, do deset dana. Primena balneoterapije zavisi od zdravstvenog stanja pacijenta. Ako pacijent ima ugrađen pejsmejker ili hipertenziju, nivo vode u kadi može da bude do nivoa srca, ili umbilikalne regije, a nikad preko nivoa srca zbog hidrostatskog pritiska. Temperatura vode u kadama je 34°C do 36°C, a svaka osoba boravi u vodi do 20 minuta svaki drugi dan. U termalnom bazenu temperatura vode je do 33°C, i tu osoba provodi 30 minuta, svaki drugi dan. Vežbe u bazenu su grupne ili pojedinačne sa vremenskim trajanjem od maksimalno 30 minuta. To su vežbe za jačanje kardio-respiratornog sistema, vežbe za jačanje gornjih ekstremiteta i vratnog dela kičmenog stuba, većinom se vežbe sprovode kroz vodu sa istovremenim blagim čučnjem i vežbama izdržljivosti i za gornje i za donje ekstemitetete, kao i vežbama za povećanje obima pokreta gornjih ekstemiteta. Nakon boravka u termomineralnoj vodi pacijenti se moraju odmarati 30 minuta u prostoriji za odmaranje.

Uspešnost balneoterapije određivana je merenjem intenziteta bola vizuelno-analognom skalom (VAS). VAS je podeljena u podeoke od po 1 cm, od 0 do 10. Bolesnik na skali pokazuje svoj intenzitet bola, gde 0 označava stanje bez bola, a 10 maksimalni bol. Isti test je urađen pre i posle terapije. Slab bol je označen sa 1 do 3, umereno jak bol sa 4 do 6, a jak bol od 7 do 10.

U statističkoj analizi podataka korišćen je χ^2 ili *Fisher*-ov test.

The thermal mineral water from Spa Vrucica (Bosnia and Herzegovina) is highly mineral water and it belongs to the category of carbo-acidic waters. It does not have an unpleasant smell because it does not contain sulfur (1). It is used for drinking, bathing in bathtubs, hydrotherapy in pools, and the inhalation of aerosols and carbon dioxide in gas baths. Thermal mineral waters have mechanical, thermal, and chemical effects. The mechanical effect is related to the active-assisted exercises in bathtubs or pools. As far as the thermal effect is concerned, exercises that are done in pools are made easier, and therefore, it is easier to make some motions in case of joint damage. Carbon dioxide from water penetrates into the skin and chemically stimulates the endings of thermoreceptors in the skin. This stimulus causes vasodilatation on the periphery, which is important in diseases of blood vessels, in which contraindications include heat (2). Carbon dioxide lowers the arterial tonus and increases the tonus of veins, thus reducing the peripheral resistance in the arterial system. Therefore, the heart works more easily, and blood flows more easily in the organism. The systole is strengthened, while the diastole is prolonged, and the heart takes rest with the improvement of coronary circulation of blood and metabolism in the heart muscle. Carbon dioxide, which has a positive influence on the center for breathing, causes deeper breaths and an increase of pulmonary ventilation. Also, thermal mineral water, with its thermal and mechanical effect, alleviates the spasm of muscles and causes pain relief, thus improving the mobility of extremities, and spine, as well. It is important to emphasize that thermal mineral water has a favorable effect on the diseases of the skeletal system, conditions after orthopedic surgeries and traumatic injuries, and peripheral nerve paralysis.

There are no absolute contraindications for the application of this water, while relative contraindications can be heart decompensation, active tuberculosis, febrile conditions, and malign disorders of heart rate (2). In the long tradition of application of thermal waters, protocols have been made regarding its application, its quantity, the length of the procedure, and the total length of spa treatment (3).

The aim of this study was to examine the significance of balneotherapy for the reduction of pain in elderly persons with cervical syndrome, who were treated in the Hospital and Tourism Center - Vrucica Spa.

Methods

The research was conducted in the Hospital and Tourism Center Vrucica Spa, in Teslic, from October 1st, 2018 to October 11th, 2018. In this period, cervical syndrome was diagnosed in 75 patients, aged 61 to 80 years, and the diagnosis was made on the basis of clinical examination and radiological findings (tomography, CT). With the aim of perceiving the significance of balneotherapy for the reduction of pain, all persons, who had contraindications for this therapy, were excluded from the study (one man and 12 women, because they had heart decompensation or heart rate disorders, or they used analgetics). All persons, who had moderately severe pain, were included in the study (the intensity of pain was 4 to 6 on the Visual Analogue Scale).

All persons with the cervical syndrome were treated with one of the following balneology procedures: thermal mineral baths, when water filled one half of the bathtub; thermal mineral baths, when water in the bathtubs filled two-thirds of the bathtub, or thermal pools with exercises, up to 10 days. The application of balneotherapy depends on the patient's health condition. If the patient has a pacemaker or hypertension, the level of water in the bathtub can reach the level of the heart, or umbilical region, and never above the level of the heart due to the hydrostatic pressure. The temperature of the water in bathtubs was 34°C to 36°C, and each person spent up to 20 minutes in that water every other day. The temperature of the water in the thermal pool was up to 33°C, and persons spent 30 minutes in the pool, every other day. Exercises in the pool were a group or individual exercises, lasting 30 minutes maximum. These were exercises that strengthen the cardio-respiratory system, upper extremities, and neck part of the spine. They were mainly done in water with the simultaneous mild squat position and exercises of endurance for upper and lower extremities, and exercises that improved the

Tabela 1. Distribucija muškaraca i žena sa cervikalnim sindromom prema uzrastu

Uzrasne grupe/ ***Age groups***	**Muškarci/*Men* (N=10) Broj/*No* (%)**	**Žene/*Women* (N=52) Broj/*No* (%)**	**Ukupno/*Total* (N=62) Broj/*No* (%)**
61-70 godina/*years*	6 (60.0)	32 (61.5)	38 (61.3)
71-80 godina/*years*	4 (40.0)	20 (38.5)	24 (38.7)
Ukupno/*Total*	10 (100.0)	52 (100.0)	62 (100.0)

χ^2=0.302; p=0.582

Rezultati

Istraživanjem su obuhvaćena 62 pacijenta sa cervikalnim sindromom uzrasta 61 do 80 godina, od kojih su 83,9% činile žene i 16,1% muškarci (Tabela 1). Između muškaraca i žena nije bilo značajne razlike u odnosu na uzast.

Kod ispitanika sa cervikalnim sindromom cervikalni bol se najčešće širio u oba ramena obe ruke kod 48,4% ispitanika ili jedno rame kod 46,8% ispitanika, a najređe u potiljak (4,8%) (Tabela 2). Između muškaraca i žena nije bilo značajne razlike u odnosu na projekciju cervikalnog bola.

Najveći broj ispitanika sa cervikalnim sindromom (50,0% muškaraca i 40,4% žena) je koristio mineralne kupke sa polovinom vode u kadama, a najmanje mineralni bazen sa vežbama (25,0% žena i 10,0% muškaraca) (Tabela 3).

Posle deset dana terapije, kod jedne trećine ispitanika koji su imali umereno jak cervikalni bol, posle korišćenja termonineralne kupke sa i bez bazena došlo je do prestanka bola (Tabela 4). Kod svakog drugog ispitanika sa umereno jakim intezitom cervikalnog bola došlo je do nestanka bola posle deset dana od korišćenja termomineralne kupke do ⅔ kade, a kod jedne trećine ispitanika posle korišćenja termomineralnog bazena i vežbi. Značajno bolji efekat u eliminisanju bola bio je posle termomineralne kupke sa vodom do ⅔ kade i termomineralnog bazena sa vežbama, nego posle korišćenja termomineralne kupke sa vodom ½ kade. Nije utvrđeno da postoji značajna razlika u redukciji cervikalnog bola posle primene termomineralne kupke do ⅔ vode u kadi i korišćenja termomineralnog bazena sa vežbama.

Diskusija

Sindrom bolnog vrata u većini razvijenih zemalja, pa i u zemljama u razvoju, je vodeći uzrok za upućivanje pacijenata lekaru porodične medicine i fizijatru, a prema podacima zvanične statistike za Bosnu i Hercegovinu, u strukturi

Tabela 2. Distribucija muškaraca i žena sa cervikalnim sindromom u odnosu na lokaciju i projekciju bola

Projekcija cervikalnog bola/ ***Projection of cervical pain***	**Muškarci/*Men* (N=10) Broj/*No* (%)**	**Žene/*Women* (N=52) Broj/*No* (%)**	**Ukupno/*Total* (N=62) Broj/*No* (%)**
Cervikalan bol sa širenjem u oba ramena, obe ruke/ *Cervical pain that spreads to both shoulders, both arms*	7 (70.0)	23 (44.2)	30 (48.3)
Cervikalan bol sa širenjem u jedno rame/ *Cervical pain that spreads to one shoulder*	2 (20.0)	27 (51.9)	29 (47.7)
Cervikalna bol sa širenjem u potiljak/ *Cervical pain that spreads to the nape of the neck*	1 (10.0)	2 (3.9)	3 (4.0)

χ^2=3.635; p=0.162

Table 1. Distribution of men and women with the cervical syndrome by age

Uzrasne grupe/ *Age groups*	Muškarci/*Men* (N=10) Broj/*No* (%)	Žene/*Women* (N=52) Broj/*No* (%)	Ukupno/*Total* (N=62) Broj/*No* (%)
61-70 godina/*years*	6 (60.0)	32 (61.5)	38 (61.3)
71-80 godina/*years*	4 (40.0)	20 (38.5)	24 (38.7)
Ukupno/*Total*	10 (100.0)	52 (100.0)	62 (100.0)

χ^2=0.302; p=0.582

mobility of upper extremities. After their stay in thermal mineral water, patients had to rest for 30 minutes in the room for resting.

The Visual Analogue Scale (VAS) was used to measure the intensity of pain and therefore, determine the success of balneotherapy. The Visual Analogue Scale is divided into subscales of 1 cm, from 0 to 10. The patient rates the intensity of his/her pain on the scale, where 0 denotes condition without pain, while 10 is maximum pain. The same test was done before and after therapy. Mild pain was classified as 1 to 3, moderately severe pain as 4 to 6, while severe pain was classified as 7 to 10.

In the statistical analysis of data, χ^2 test or Fisher test was used.

Results

The research included 62 patients with cervical syndrome, aged 61 to 80 years, of whom 83.9% were women and 16.1% were men (Table 1). There was no significant difference between men and women in relation to age.

In examinees with the cervical syndrome, this cervical pain spread most frequently to both shoulders and both arms in 48.8% of examinees or one shoulder in 46.8% of examinees, and least frequently into the nape of the neck (4.9%) (Table 2). There was no significant difference between men and women regarding the projection of cervical pain.

The greatest number of examinees with the cervical syndrome (50.0% of men and 40.4% of women) used mineral baths with one half of water in the bathtubs, and the smallest number of them used the mineral pool with exercises (25.0% of women and 10.0% of men) (Table 3).

After ten days of therapy, in around one-third of examinees, who had moderately severe cervical pain, the pain stopped after the thermal mineral bath with and without exercises (Table 4). In every other examinee with the moderately severe intensity of cervical pain, this pain was eliminated after ten days of using the thermal mineral bath with water that reached ⅔ of the bathtub, while in every third examinee that

Table 2. Distribution of men and women with cervical syndrome by location and projection of pain

Projekcija cervikalnog bola/ ***Projection of cervical pain***	Muškarci/*Men* (N=10) Broj/*No* (%)	Žene/*Women* (N=52) Broj/*No* (%)	Ukupno/*Total* (N=62) Broj/*No* (%)
Cervikalan bol sa širenjem u oba ramena, obe ruke/ *Cervical pain that spreads to both shoulders, both arms*	7 (70.0)	23 (44.2)	30 (48.3)
Cervikalan bol sa širenjem u jedno rame/ *Cervical pain that spreads to one shoulder*	2 (20.0)	27 (51.9)	29 (47.7)
Cervikalna bol sa širenjem u potiljak/ *Cervical pain that spreads to the nape of the neck*	1 (10.0)	2 (3.9)	3 (4.0)

χ^2=3.635; p=0.162

Tabela 3. Distribucija muškaraca i žena sa cervikalnim sindromom u odnosu na vrstu balneoterapije

Balneoterapija/ *Balneotherapy*	**Muškarci/*Men* (N=10) Broj/*No* (%)**	**Žene/*Women* (N=52) Broj/*No* (%)**	**Ukupno/*Total* (N=62) Broj/*No* (%)**
Termomineralne kupke ½ kade/ *Thermal mineral baths ½ of the bathtub*	5 (50.0)	21 (40.4)	26 (41.9)
Termomineralne kupke ⅔ kade/ *Thermal mineral baths ½ of the bathtub*	4 (40.0)	18 (34.6)	22 (35.5)
Termomineralni bazen sa vežbama/ *Thermal mineral baths ½ of the bathtub*	1 (10.0)	13 (25.0)	14 (22.6)

χ^2=1.089; p=0.580

najčešćih oboljenja u ambulantno-polikliničkoj praksi za 2004. godinu (1). U opštoj populaciji, oko dve trećine svih osoba tokom života ima bol u vratnom delu kičme (1). U našem radu najčešća je projekcija cervikalnog bola u jedno rame ili oba ramena, a najređe u potiljak. Studije na zdravim ispitanicima potvrđuju tvrdnje da se osetljivost na bol povećava u kranijalnom pravcu kičmenog stuba (3,4). Navodi se da predeo potiljka pokazuje najniže vrednosti praga bola, predeo ramena srednje, a najviše lumbosakralni predeo (4). Utvrđeno je i da paraspinalni lumbalni mišići i srednji glutealni mišić imaju viši prag bola od trapeznog mišića (5).

U našoj studiji, u terapiji cervikalnog bolnog sindroma od fizikalnih i balneoloških procedura koristile su se termomineralne kupke i termo-mineralni bazen sa vežbama. Značajno bolji efekat u eliminisanju bola je bio posle termo-mineralne kupke sa vodom do ⅔ kade i termomineralnog bazena sa vežbama, nego posle korišćenja termomineralne kupke sa vodom do ½ kade. Nije utvrđeno da postoji značajna razlika u redukciji cervikalnog bola

Tabela 4. Intenzitet bola prema vizuelno analognoj skali (VAS) pre i posle desetodnevne balneoterapije

Balneoterapija/ *Balneotherapy*	**Sa srednje jakim bolom pre terapije/*With a moderately severe pain before therapy* (N=62) Broj/*No* (%)**	**Bez bola posle terapije/ *No pain after therapy* (N=17) Broj/*No* (%)**
Termomineralne kupke ½kade (grupa 1)/ *Thermal mineral baths ½ of the bathtub (group 1)* (N=26)	26 (100.0)	0 (0.0)
Termomineralne kupke ⅔ kade (grupa 2)/ *Thermal mineral baths ⅔ of the bathtub (group 2)* (N=22)	22 (100.0)	12 (54.5)
Termomineralni bazen sa vežbama (grupa 3)/ *Thermal mineral pool with exercises (group 3)* (N=14)	14 (100.0)	5 (35.7)
Ukupno/*Total*	62 (100.0)	17 (27.4)

Grupa 1: Grupa 2/*Group 1:Group 2*, *Fisher*-ov test/*Fisher test* p = 0.001
Grupa 1: Grupa 3/*Group 1:Group 3*, *Fisher*-ov test/*Fisher test* p = 0.009
Grupa 2: Grupa 3/*Group 2:Group* 3, χ^2 test = 0.451; p = 0.502

Table 3. Distribution of men and women with the cervical syndrome according to the type of balneotherapy

Balneoterapija/ ***Balneotherapy***	**Muškarci/*Men* (N=10) Broj/*No* (%)**	**Žene/*Women* (N=52) Broj/*No* (%)**	**Ukupno/*Total* (N=62) Broj/*No* (%)**
Termomineralne kupke ½ kade/ *Thermal mineral baths ½ of the bathtub*	5 (50.0)	21 (40.4)	26 (41.9)
Termomineralne kupke ⅔ kade/ *Thermal mineral baths ½ of the bathtub*	4 (40.0)	18 (34.6)	22 (35.5)
Termomineralni bazen sa vežbama/ *Thermal mineral baths ½ of the bathtub*	1 (10.0)	13 (25.0)	14 (22.6)

χ^2=1.089; p=0.580

used thermal mineral pool and exercises. A significantly better effect in pain elimination was achieved after the thermal mineral bath with water that filled ⅔ of the bathtub and after the thermal mineral pool with exercises than after the thermal mineral bath with water that filled ½ of the bathtub. It was not determined whether there was a significant difference regarding the cervical pain elimination between the usage of thermal mineral bath that filled ⅔ of the bathtub and thermal mineral pool with exercises.

Discussion

The syndrome of neck pain in the majority of developed countries, as well as in developing countries, presents a leading cause of referring patients to their family doctors or physiatrists, while according to the data of the official statistics for Bosnia and Herzegovina, it represented one of the most common diseases in the ambulance-clinical practice in 2014 (1). In the general population, around two-thirds of people at some stage in life experience neck pain (1). In our study, the most common projection of cervical

Table 4. Intensity of pain according to the Visual Analogue Scale (VAS) before and after ten days of balneotherapy

Balneoterapija/ ***Balneotherapy***	**Sa srednje jakim bolom pre terapije/*With a moderately severe pain before therapy* (N=62) Broj/*No* (%)**	**Bez bola posle terapije/ *No pain after therapy* (N=17) Broj/*No* (%)**
Termomineralne kupke ½kade (grupa 1)/ *Thermal mineral baths ½ of the bathtub (group 1)* (N=26)	26 (100.0)	0 (0.0)
Termomineralne kupke ⅔ kade (grupa 2)/ *Thermal mineral baths ⅔ of the bathtub (group 2)* (N=22)	22 (100.0)	12 (54.5)
Termomineralni bazen sa vežbama (grupa 3)/ *Thermal mineral pool with exercises (group 3)* (N=14)	14 (100.0)	5 (35.7)
Ukupno/*Total*	62 (100.0)	17 (27.4)

Grupa 1: Grupa 2/*Group 1:Group 2*, *Fisher*-ov test/*Fisher test* p = 0.001
Grupa 1: Grupa 3/*Group 1:Group 3*, *Fisher*-ov test/*Fisher test* p = 0.009
Grupa 2: Grupa 3/*Group 2:Group* 3, χ^2 test = 0.451; p = 0.502

posle primene termomineralne kupke do ⅔ vode u kadi i korišćenja termomineralnog bazena sa vežbama.

Neke studije navode da često emocionalne promene, u vidu depresije i anksioznosti, mogu da prate hroničan bol kod cervikalnog sindroma, kao i disfunkcionalni i maladaptivni obrasci ponašanja, što jasno ukazuje da pristup u lečenju pacijenata sa cervikalnim sindromom mora biti multidisciplinaran (6,7). Nekoliko studija ističe značajan uticaj bio-psihosocijalnih faktora na intenzitet bola (7-9), dok drugačije mišljenje iznose *Walton* i sar. (9), tvrdeći da psihološki faktori, kao što su katastrofizam, strah od pokreta ili povrede, depresija i anksioznost nemaju bitnu ulogu u doživljaju bola. Uočeno je da pacijenti sa preteranom negativnom orjentacijom prema bolu (katastrofizmom) imaju jači intenzitet bola i veću onesposobljenost u odnosu na pacijente bez katastrofizma (10). *Lamé* i sar. (11) ističu da katastrofizacija ima najvažniji uticaj na kvalitet života pacijenata sa hroničnim bolom. Hroničan bol može se razviti još više u slučajevima psihološkog stresa. Psihološka podrška može pomoći pacijentima u suočavanju sa bolom koji ne može biti tretiran medikamentima ili hirurški (12).

U brojnim radovima ukazuje se na značajne efekte mineralne vode i to prvenstveno kada su u pitanju reumatska oboljenja, jer dovode do poboljšanja opšteg stanja, smanjenja bola i ukučenosti (13-16). Međutim, nije mali broj studija koje ukazuju na pozitivne efekte balneoterapije, odnosno poboljšanja kvaliteta života, boljeg raspoloženja, smanjivanja tumor markera itd., kada su u pitanju pacijenti sa malignim oboljenjima (17,18), mada ima i protivnika po pitanju primene ove terapije kada je reč o pacijentima sa malignim bolestima (19).

Balneoterapija i kineziterapija su od neprocenjivog značaja jer svetska populacija stari i postoji jasna potreba za novim pristupima u terapiji bola ove populacije (20,21). Trenutna saznanja nikako nisu dovoljna za lečenje starih u našem društvu, tako da istraživanja treba da budu usmerena ka unapređenju kliničke prakse, i bolje strategije lečenja bola. Takođe, neophodni su validni naučni dokazi za efektivnost specifične mineralne vode u rehabilitaciji osoba sa cervikalnim sindromom.

Ova studija ukazuje na aktuelnu problematiku i mogućnosti primene balneoterapije i kineziterapije u redukciji ili eliminisanju bola kod cervikalnog sindroma osoba sa srednje jakim bolom, ali, sa druge strane, nedostatak ove studije je mali broj ispitanika i nedovoljan broj praćenih parametara koji mogu imati određen uticaj na krajnje ishode istraživanja, kao na primer prisustvo depresivnosti, komorbiditeta, dužina trajanja cervikalnog bola i uzrok njegovog nastanka.

Zaključak

Balneoterapija i kineziterapija zauzimaju veoma važno mesto u redukciji bola kod osoba sa srednje jakim intezitetom bola uzrokovanim cervikalnim sindromom. Neophodna su dalja detaljnija istraživanja značaja balneoterapije i kineziterapije za redukciju bola kod cervikalnog sindroma. Timski pristup, kroz otvorenu kominikaciju fizijatra, psihologa, ali i ostalih članova tima, svakako jeste preduslov za izbor dobre terapije i bolji funkcionalni oporavak osoba. Bolje informisanje bolesnika o načinu nastanka bolesti i pravilna upustva za lečenje i ponašanje u periodu posle rehabilitacije u kućnim uslovima značajno smanjuju recidive cervikalnog sindroma.

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pain was into one shoulder or both shoulders, while the least frequent projection was in the nape of the neck. Studies on healthy examinees confirmed that sensitivity to pain increased in the cranial direction of the spine (3,4). It was stated that the nape of the neck showed the lowest values of the pain threshold, while the region of shoulders showed the moderate and the lumbosacral showed the greatest values (4). It was found out that lumbar parasacral muscles and gluteus medius had a higher pain tolerance than the trapezius muscle (5).

In our study, physical and balneology procedures that were used for the treatment of cervical pain syndrome were thermal mineral baths and thermal mineral pool with exercises. A significantly better effect was achieved after the thermal mineral bath with water that filled ⅔ of the bathtub and thermal mineral pool with exercises than after the thermal mineral bath with water that filled ½ of the bathtub. It was not determined whether there was a significant difference regarding the reduction of pain between the thermal mineral bath with water that filled ⅔ of the bathtub and the usage of thermal mineral pool with exercises.

Some studies state that emotional changes in the form of depression and anxiety can often accompany the chronic pain in cervical syndrome, as well as dysfunctional and maladaptive patterns of behavior, which clearly points to the fact that the approach in treating patients with cervical syndrome has to be multidisciplinary (6,7). Several studies emphasize the significant influence of biopsychosocial factors on the intensity of the pain (7-9), while different opinion is presented by Walton and associates (9), who claim that psychological factors, such as catastrophism, fear of movement or injury, depression and anxiety do not have an important role in the experience of pain. It was noticed that patients with exaggerated negative orientation towards pain (catastrophism) experienced more severe pain and greater disability in comparison with patients without catastrophism (10). Lamé and associates (11) point out that catastrophic thinking has the most significant influence on the quality of life of patients with chronic pain. Chronic pain can develop even more in case of psychological stress. Psychological support can help patients to deal with pain, which cannot be treated with medicines or surgically (12).

In numerous studies, significant effects of mineral water are pointed to, especially in the case of rheumatoid diseases, because it leads to the improvement of overall condition, to the reduction of pain and stiffness (13-16). However, there are a lot of studies which point to the positive effects of balneotherapy, that is, a better quality of life, better mood, or reduction of tumor markers in patients with malign diseases (17,18), although there are some opponents of this therapy regarding patients with malign diseases (19).

Balneotherapy and kinesitherapy are of utmost importance because the world population gets older and there is a clear need for new approaches in the treatment of this population (20,21). Current knowledge is not sufficient for the treatment of the elderly in our society, and therefore, research should be directed towards the improvement of clinical practice, and better strategies regarding the treatment of pain. Also, valid scientific evidence is necessary to prove the efficiency of specific mineral water in the rehabilitation of persons with cervical syndrome.

This study points to the actual topic and possibilities of the application of balneotherapy and kinesitherapy in the reduction or elimination of pain in persons with cervical pain and with moderately severe pain. However, the lack of this study may be the small number of participants and the insufficient number of observed parameters that could have some influence on the final outcomes of the research, such as the presence of depression, comorbidities, duration of cervical pain, and the cause of its occurrence.

Conclussion

Balneotherapy and kinesitherapy take an important place in the reduction of pain in persons with moderately severe pain intensity caused by the cervical syndrome. More detailed research is needed to examine the significance of balneotherapy and kinesitherapy for the reduction of pain in persons with the cervical syndrome. The team approach, that is, the open communication between physiatrists, psychologists and other team members is a precondition for the choice of appropriate therapy or better functional recovery of patients.

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Informing patients about disease occurrence and adequate guidelines for the treatment and behavior during home rehabilitation significantly reduce the recurrence of cervical syndrome.

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PRIKAZ SLUČAJA

MAJOCCHI GRANULOM: PRIKAZ PACIJENTA

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SAŽETAK

Uvod/cilj: *Majocchi* granulom predstavlja duboku hroničnu infekciju folikula dlake u kojoj dermatofiti prodiru u dermis i/ili hipodermis izazivajući granulomatozne promene na koži. Postoje dve kliničke forme oboljenja: površna, koja se ispoljava u vidu perifolikularnih papula i javlja se kod imunokompetentnih pacijenata i duboka forma, praćena pojavom plakova i nodusa, opisana kod imunosuprimiranih osoba. Najčešći uzročnik ovog oboljenja je dermatofit *Trichophyton rubrum*. Cilj rada je da prikaže retku lokalizaciju ovog oboljenja u predelu vulve.
Prikaz bolesnika: Imunokompetentna pacijentkinja, stara dvadeset godina, javila se lekaru sa brojnim papulama, nodusima i pustulama u predelu kosmatog dela vulve. Iz uzorka pilinga kožnih promena mikroskopski pregled sa kalijum hidroksidom bio je negativan, dok je na *Sabouraud*-ovom glukoznom agaru izolovan *Trichophyton rubrum*. Nakon četvoronedeljne oralne sistemske antimikotične terapije, došlo je do regresije promena.
Zaključak: Kod pojave hronične infekcije u vidu papuloznih i nodoznih promena u regiji vulve, uvek treba razmišljati i o ovoj retkoj gljivičnoj infekciji.

Ključne reči: *Majocchi* granulom, vulva, *Trichophyton rubrum*, prikaz slučaja

Uvod

Dermatomikoze su česta oboljenja kože kod adolescenata (1), a izazivaju ih keratinofilne gljive koje parazitiraju u rožnatom sloju (lat. *stratum corneum*), kosi i noktima. *Majocchi* granulom je retka, duboka gljivična infekcija u kojoj patogen napada folikule dlake, prodirući u dermis ili subkutano tkivo, tako formirajući granulomatozne dermalne i/ili hipodermalne promene.

Najčešći uzročnik ove infekcije je *Trichophyton rubrum*, i postoje dve kliničke forme oboljenja (2). Prva se najčešće javlja kod zdravih osoba i karakteriše je površinska perifolikularna papularna infekcija, dok je druga praćena dubokim subkutanim nodusima i obično se javlja kod imunokompromitovanih osoba. Smatra se da ovo oboljenje izazivaju produžena primena topikalnih steroida ili trauma na koži posle brijanja nogu ili drugih kosmatih delova kože, naročito kod žena. Međutim, infekcija vulve je retko prijavljivana (3).

Cilj ovog rada je da prikaže retku lokalizaciju ove duboke gljivične infekcije.

Prikaz pacijenta

Dvadesetogodišnja imunokompetentna studentkinja javila se lekaru u Gradski zavod za kožne i venerične bolesti u Beogradu zbog lezija na vulvi koje su izazivale svrab i bolele mesec dana. Upućena je od strane ginekologa koji je lečio lezije deset dana oralnim antibioticima i kremom topikalnih steroida, što je malo ublažilo bolove. Pacijentkinja je imala naviku da brije bikini zonu i negirala je postojanje traume ili prethodne infekcije pubične regije, a isti brijač je koristila za brijanje nogu i pazušnih jama.

Fizički pregled je pokazao postojanje brojnih eritematoznih papula i nodusa koji su konfluirali u plak sa superponiranim pustulama prekrivajući njen stidni brežuljak (lat. *mons pubis*) (Slika 1). Dalji pregled je pokazao postojanje alopecičnog polja u pubičnoj regiji. Pacijentkinja je osećala blagi svrab (pruritus). Inače, bila je zdrava i nije

CASE REPORT

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MAJOCCHI'S GRANULOMA OF THE VULVA − A CASE REPORT

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SUMMARY

Introduction/Aim: Majocchi's granuloma is an infrequent deep-seated fungal infection where pathogen invades hair follicles, entering the dermal and subcutaneous tissue, thus forming granulomatous dermal and/or hypodermal changes. There are two clinical types: the first one is common in healthy individuals characterized by superficial perifollicular papular infection, and the second is followed by the deep subcutaneous nodules usually reported among immunocompromised hosts. This infection is usually caused by *Trichophyton rubrum*. The aim of this paper is to show the rare localization of this disease in the area of the vulva.
Case report: We present a 20-year-old immunocompetent woman with multiple papules, nodules, and pustules on the hairy part of the vulva. Potassium hydroxide preparations of skin scrapings were negative and culture performed on Sabouraud glucose agar revealed *Trichophyton rubru*m. The patient was treated with the oral systemic antifungal therapy for four weeks and all lesions resolved.
Conclusion: Majocchi's granuloma should not be overlooked in patients with papular and nodular lesions in the vulvar region.

Key words: Majocchi's granuloma, vulva, *Trichophyton rubrum*, case report

Introduction

Dermatomycoses are frequent skin disorders in adolescents (1) and they are caused by keratinophilic fungi which parasitize in the *stratum corneum*, hair and nails. Majocchi's granuloma is an infrequent deep-seated fungal infection where pathogen invades hair follicles, entering the dermal and subcutaneous tissue, thus forming granulomatous dermal and/or hypodermal changes.

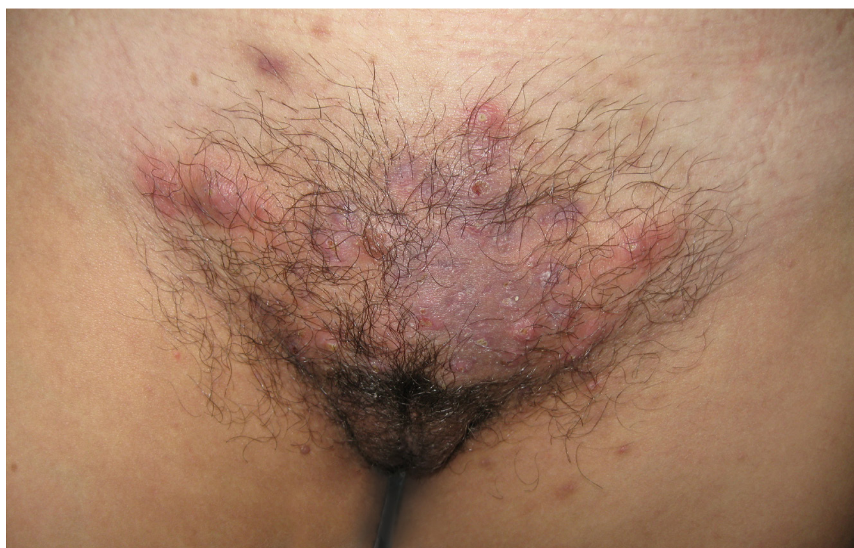
This infection is usually caused by *Trichophyton rubrum*, and there are two clinical types (2). The first one is common in healthy individuals characterized by superficial perifollicular papular infection, and the second is followed by the deep subcutaneous nodules usually reported among immunocompromised hosts. The disorder is thought to be precipitated by prolonged use of topical steroids or by trauma to the skin after shaving the legs or other hair-bearing areas, especially in women. However, infection of the vulva is rarely reported (3).

The aim of this paper was to report a rare localization of this deep fungal infection.

Case report

A 20-year-old immunocompetent girl, a student, presented at the City Institute for Skin and Venereal Diseases in Belgrade with a one-month history of itchy and painful lesions on her vulva. She was referred by her gynecologist who had treated the lesions for ten days with oral antibiotics and topical steroid cream with a slight improvement of the pain. She used to shave the bikini area and denied any history of trauma or previous infections of the pubic region, but she used the same razor for shaving both legs and armpits.

Physical check-up showed that there were numerous erythematous papules and nodules coalescing into the plaque with superimposed pustules covering her *mons pubis* (Figure 1). Further examination also revealed patches of alopecia in the pubic area. The patient



Slika 1. Multiple papule i nodusi koji konfluiraju u plak sa superponiranim pustulama i alopecičnim poljem u pubičnoj regiji

koristila lekove, a njena istorija bolesti bila je bez značajnih oboljenja. Rutinske biohemijske analize krvi bile su u granicama normale.

Mikološki pregled sa kalijum hidroksidom (KOH) iz uzorka pilinga kožnih promena bio je negativan, dok je *Trychophyton rubrum* izolovan iz uzorka na *Sabouraud*-ovom glukoznom agaru. Sve lezije su se povukle nakon lečenja sistemskom antimikotičkom terapijom. Pacijentkinja je koristila 200 mg itrakonazola dnevno u periodu od četiri nedelje. Lezije su se potpuno povukle, a test sa kalijum hidroksidom i mikološka kultura dve nedelje nakon toga bili su negativni. Pacijentkinji su ponovo izrasle pubične dlake dva meseca nakon lečenja.

Površinski perifolikularni oblik *Majocchi* granuloma najčešće se javlja na potkolenici i ručnom zglobu. Diferencijalna dijagnoza uključivala je bakterijske pioderme, netuberkulozne mikobakterijske infekcije, i sistemske gljivične infekcije (4). Topikalni agensi su retko efikasni u terapiji zbog dubine infekcije. Stoga su uglavnom potrebni oralni antimikotički lekovi (5).

Zaključak

Dermatolozi i ginekolozi ne sreću često *Majocchi* granulom vulve i on je retko opisivan u medicinskim časopisima. Ne treba zanemariti značaj ovog oboljenja kod pacijenata sa papuloznim i nodoznim lezijama u predelu vulve.

Zahvalnost

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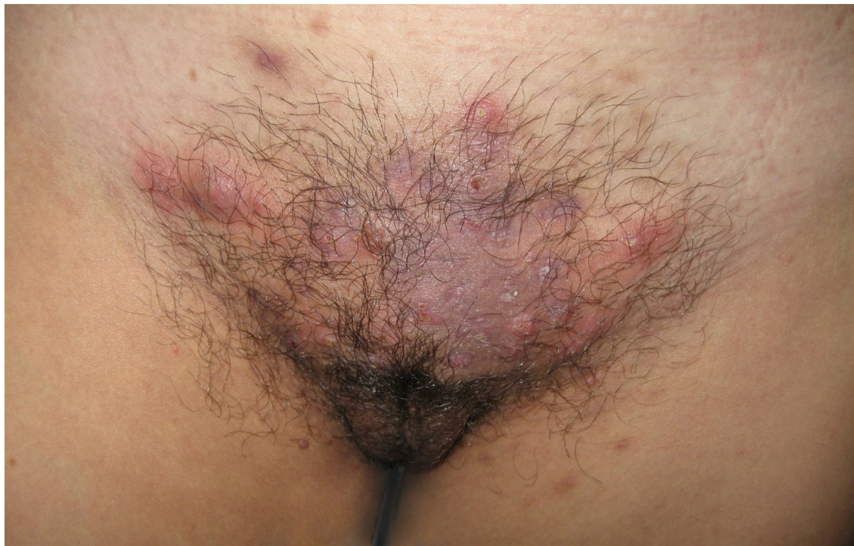

Picture 1. Multiple papules and nodules coalescing into the plaque with superimposed pustules and patches of alopecia in the pubic area

experienced mild pruritus. Otherwise, she was healthy and not taking any medications, her medical history was without significant illness. Complete blood count and routine biochemistry tests were normal.

On mycological examination, potassium hydroxide preparations of the skin scraping were negative and the *Trichophyton rubrum* was isolated from a culture of skin scrapings grown on Sabouraud glucose agar. All lesions resolved after treating the patient with systemic antifungal therapy. The patient was given 200 mg of itraconazole daily for a period of four weeks. This caused the lesions to fully recede, while the potassium hydroxide (KOH) test and fungal culture conducted two weeks afterwards were negative. The patient experienced pubic hair regrowth within 2 months of treatment.

The superficial perifollicular form of Majocchi's granuloma occurs most frequently on the shins or wrists. The differential diagnosis included bacterial pyodermas, nontuberculous mycobacterial infections, and systemic fungal infections (4). Topical agents are hardly ever effective therapeutically due to the deep infection location. Therefore, oral antifungal agents are largely needed (5).

Conclusion

Majocchi's granuloma of the vulva is seldom encountered by dermatologists and gynecologists and rarely described in medical journals. This disease should not be overlooked in patients with papular and nodular lesions in the vulvar region.

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DECA SA POSEBNIM POTREBAMA U STOMATOLOŠKOJ ORDINACIJI

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SAŽETAK

Kod osoba sa smetnjama u razvoju prisutan je nesklad između očekivanih aktivnosti i njihovih mogućnosti, što ograničava ili onemogućava učestvovanje u mnogim segmentima života u poređenju sa njihovim zdravim vršnjacima. Zbog toga je potreban poseban pristup u stomatološkoj ordinaciji prilikom plana i izvođenja stomatološkog tretmana. Uloga stomatologa u održavanju i unapređenju zdravlja usta i zuba kroz primenu adekvatnih i redovnih preventivnih, profilaktičkih i terapijskih mera kod osoba sa posebnim potrebama izuzetno je važna, jer ishod stomatološkog preventivnog ili terapijskog tretmana kod pripadnika ove osetljive i često stigmatizovane grupe pacijenata treba da bude isti kao kod zdravih vršnjaka prema deklaraciji o ljudskim pravima Ujedinjenih nacija. Uz poznavanje karakteristika opšteg oboljenja, potrebno je da stomatolog poseduje određena znanja i veštine iz oblasti psihologije kako bi prilagodio svoj pristup potrebama pacijenta. Rad na unapređenju i očuvanju oralnog zdravlja dece s posebnim potrebama uključuje rad stomatologa na nivou primarne, sekundarne i tercijarne zdravstvene zaštite u zavisnosti od potreba i mogućnosti pacijenta. Timski rad i multidisciplinarni pristup, uz saradnju stručnjaka različitih profila i specijalnosti, je jedini pristup koji daje zadovoljavajuće rezultate.

Ključne reči: deca, posebne potrebe, obrazovanje, stomatologija

Uvod

Prema Američkoj akademiji za dečiju stomatologiju u stomatološke pacijente sa posebnim potrebama se svrstavaju osobe sa telesnim, razvojnim, mentalnim, senzornim, bihejvioralnim, kognitivnim ili emotivnim poteškoćama koje zahtevaju posebnu intervenciju od strane lekara kao pripremu za isplaniranu stomatološku intervenciju i/ili korišćenje posebnih tehnika, metoda i zdravstvenih usluga (1). Ovakva stanja mogu biti posledica urođenih, razvojnih ili stečenih oboljenja, trauma, delovanja faktora sredine, koji onemogućavaju redovno i svakodnevno samostalno održavanje oralne higijene i ograničavaju aktivnosti pojedinaca. Izjednačavanje pojmova „osobe sa posebnim potrebama" i „osobe sa smetnjama u intelektualnom razvoju" je pogrešno i neetično, budući da nisu sve posebne potrebe uzrokovane teškoćama u razvoju.

Prema izveštaju Svetske zdravstvene organizacije 10-15% osoba na svetu pripada osobama sa disabilitetom, zbog „dugoročnih fizičkih, mentalnih, intelektualnih ili čulnih oštećenja koja u interakciji sa raznim preprekama mogu ometati njihovo puno i efikasno učešće u društvu na jednakoj osnovi sa drugima", kako se u Konvenciji Ujedinjenih nacija definišu osobe sa disabilitetom ili sa posebnim potrebama (2). Prilikom sveobuhvatnog posmatranja ljudskog zdravlja i bitnih determinanti zdravlja, kod ovih osoba postoji nesklad između očekivanih aktivnosti i njihovih mogućnosti, što ograničava učestvovanje u mnogim segmentima života u poređenju sa njihovim zdravim vršnjacima (3). Pacijenti sa posebnim potrebama u stomatološkoj ordinaciji dečjeg stomatologa

REVIEW ARTICLE

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CHILDREN WITH SPECIAL NEEDS IN THE DENTAL OFFICE

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SUMMARY

People with disabilities may experience negative relation between their own personal potentials compared to environmental expectations and potentials of healthy peers in terms of functional participation and activity limitations. Therefore, they usually need an individualized dental treatment plan. Dentists have an important role in maintaining and improving oral health in this vulnerable group. Having in mind the United Nation's Declaration on Human Rights, patients with disabilities have human rights to achieve equal health outcomes as their healthy peers. Therefore, all preventive, prophylactic, and therapeutic interventions need to be carefully planned. In addition to precise medical history, the dentist should also have basic psychological knowledge to adjust the approach to patient's needs. Improving the oral health of patients with disabilities involves a primary, secondary, or tertiary level of oral health care, depending on patient's abilities and needs. The team work and a multidisciplinary approach, with the cooperation of experts of different profiles and specialties, is the only approach that gives satisfactory results.

Keywords: Children, special needs, education, dentistry

Introduction

According to the American Academy of Pediatric Dentistry, dental patients with special health care needs are persons with physical, developmental, mental, sensory, behavioral, cognitive or emotional impairment that requires special medical intervention as the preparation for the planned dental intervention and/or use of specialized techniques, methods and health care services (1). Such conditions may be congenital, developmental or acquired through disease, trauma or environmental cause, and they limit or disable daily life activities such as performing oral health care or eating without any help. Making the terms "*people with special needs*" and "*people with intellectual disabilities*" equal is incorrect and it is not ethical because special needs in dental office involve broad group of circumstances not all caused by developmental disabilities.

According to the report of the World Health Organization, 10-15% of people in the world belong to persons with disabilities, due to "*long-lasting physical, mental, intellectual or sensory impairment, which in interaction with various obstacles, may disable their complete and efficient participation in the society on an equal basis with others*", which is the definition of persons with disabilities or special needs from the United Nations Convention (2). When health and determinants of health are observed in a comprehensive way, in persons with disabilities disharmony between expected activities and their abilities may be experienced, which limits the participation in various segments of life in comparison to their healthy peers (3). Patients with special needs in the pediatric dental office include a wide spectrum of vulnerable and often stigmatized persons, who need a special approach when planning and performing the dental treatment in order to achieve therapeutic success (1).

Beside the main health difficulties, which they suffer from, persons with special needs may

obuhvataju široku grupu osetljivih i veoma često stigmatizovanih osoba prema kojima je potrebno primeniti poseban pristup prilikom planiranja i izvođenja stomatološkog tretmana kako bi se postigao uspeh terapije (1).

Van osnovnih zdravstvenih poteškoća od kojih pate, osobe sa posebnim potrebama se mogu osećati zadovoljno i zdravo – a uz adekvatne i pravovremene informacije mogu ostvariti svoj pun potencijal zdravlja (4). Dakle, uz rane profilaktičke mere, preventivne savete o održavanju oralne higijene i pravilnom dijetetskom režimu, i uz dodatnu pomoć roditelja, staratelja ili negovatelja, prilikom održavanja oralne higijene, moguće je ostvariti pun potencijal oralnog zdravlja kod osoba sa posebnim potrebama. Ipak, podaci iz prakse i literature ukazuju na loše stanje oralnog zdravlja dece sa posebnim potrebama u Srbiji, veliki broj nesaniranih zuba i prisustvo komplikacija oralnih oboljenja (5). Smatra se da postoji više razloga za ovakvu situaciju, a u osnovi je otežana dostupnost stomatološke zdravstvene zaštite zbog nedovoljnog broja stomatologa obučenih i voljnih da pružaju usluge ovoj osetljivoj grupi pacijenata, otežana saradnja stomatologa sa pacijentima, ograničena količina resursa, nedovoljna zdravstvena svest roditelja/staratelja/negovatelja o značaju održavanja oralne higijene, odsustvo socijalne podrške, itd (6).

Osobama sa posebnim potrebama je potreban dobro obučen stomatološki tim koji je u stanju da kadrovski, vremenski i znanjem pruži potrebnu podršku ovoj osetljivoj grupi pacijenata (7). Upravo zato poseban značaj ima dodiplomska i poslediplomska obuka stomatologa – utvrđeno je da sveobuhvatna i multidisciplinarna obuka studenata osnovnih studija i zdravstvenih radnika na poslediplomskim studijama povećava broj mladih lekara koji će biti sigurni u svoje znanje, praktične veštine i veštine komunikacije, kako bi pružili jednaka prava na stomatološke usluge svim pacijentima (8). Savremena obuka prema međunarodnim smernicama daje značaj multidisciplinarnom i holističkom pristupu gde su osoba i njene mogućnosti, a ne oboljenje i ograničenja u centru interesovanja (9).

Osnovni cilj ovog preglednog rada je da istakne značaj obuke budućih stomatologa i poslediplomske obuke/kontinuirane edukacije doktora stomatologije kako bi svaki stomatolog od primarne do tercijarne zdravstvene zaštite omogućio dostupnost preventivnih, profilaktičkih i terapijskih stomatoloških usluga osobama sa posebnim potrebama.

Metode

U okviru ovog preglednog rada uključeni su stomatološki i medicinski radovi dobijeni pretraživanjem podataka preko *PubMed*-a i *MEDLINE*-a, a pri pretraživanju korišćene su sledeće ključne reči: posebne potrebe, invaliditet, deca sa invaliditetom, stomatologija, zubarska nega i oralno zdravlje. Pretraživanje je bilo ograničeno na poslednjih 15 godina, ispitivanja na ljudima i na engleskom jeziku.

Ko su stomatološki pacijenti sa posebnim potrebama?

Osnovna ljudska prava dece sa smetnjama u razvoju obuhvataju i prava na ostvarivanje punog potencijala zdravlja – pri tome, uključujući i oralno zdravlje koje je bitan deo opšteg zdravlja, bez diskriminacije po pitanju socijalnog, ekonomskog, nacionalnog osnova, usporenog psiho-motornog razvoja, prisustva opšteg oboljenja, itd (2).

Zvanični podaci iz popisa stanovništva Republike Srbije iz 2011. godine ukazuju da od ukupnog broja stanovnika skoro 7,9% predstavljaju osobe sa invaliditetom (571.780) (10). Ovom broju treba pridodati još 119.482 osoba, što je skoro 1,7% populacije, koji nemaju rešen status osoba sa invaliditetom (10). Međutim, prema nezvaničnim podacima, Nacionalna organizacija osoba sa invaliditetom Srbije (NOOIS) okuplja preko 870.000 osoba sa invaliditetom i njihove pravne zastupnike, koji su deo organizacija osoba sa pojedinačnim vrstama invaliditeta, a zatim i organizacije zakonskih zastupnika osoba sa invaliditetom i interesne organizacije (11). To znači da broj osoba sa invaliditetom u Srbiji u realnosti iznosi možda i više od 12% populacije. Naučni i tehnološki napredak savremene medicine uz primenu savremenih metoda lečenja je omogućio produženje životnog veka uz poboljšanje prognoze i kvaliteta života osobama koje boluju od urođenih oboljenja i stanja (7). Takođe, razvoj savremene stomatologije i

feel satisfied and healthy – and with adequate and timely information they can achieve their full health potential (4). Therefore, with early prophylactic measures, preventive advice about the maintenance of oral hygiene and good dietary regime, and with the additional help of parents, guardians, or caregivers while maintaining the oral hygiene, it is possible to achieve the full potential of oral health in persons with special needs. However, data from practice and literature point to the poor condition of oral health in children with special needs in Serbia, involving high prevalence of untreated caries and the presence of complications of oral diseases (5). It is thought that there are more reasons which cause this situation, while the main is the limited access to dental health care because there are not enough dentists who are willing and trained to provide quality services to this vulnerable group of patients, weak cooperation between dentists and patients, limited resources, insufficient awareness of parents/guardians/caregivers about the significance of oral hygiene, the absence of social support etc (6).

Persons with special needs need a well-trained dental team, which would be able to provide the necessary support to this vulnerable group in terms of cadre, time and knowledge (7). Therefore, special significance is given to graduate and postgraduate education of young dentists – it was found out that the comprehensive and multidisciplinary education of graduate students and postgraduate courses for health care workers increase the number of young doctors who will feel confident about their knowledge, practical skills and communication skills, in order to provide equal rights to dental services to all patients (8). Contemporary education according to the international guidelines supports multidisciplinary and holistic approach, where a person and his/her potentials are the center of interest, and not disease and limitations (9).

The aim of this review article is to point out the significance of training for future dentists and of postgraduate training/continuing education of dentists so that each dentist from primary to tertiary health care would make preventive, prophylactic and therapeutic dental services available to persons with special needs.

Methods

Literature search used for this study involved *PubMed* and *MEDLINE* data basis using key words: special needs, disability, children with disability, dentistry, dental care and oral health. The search was limited to the last 15 years, it included the research done on humans and it was in the English language.

Who are dental patients with special needs?

Basic human rights of children with disabilities include the right to accomplish the complete potential of health – also including oral health, which is an important part of the general health, without discrimination in terms of social, economic, national questions, slow psycho-motor development, the presence of some disease, etc (2).

Official data from the 2011 Census in the Republic of Serbia point out to the fact that 7.9% of general population involved persons with disabilities (571,780) (10). Furthermore, 119,482 persons should be added to this number, which is almost 1.7% of the population these persons still do not have the solved status of people with disabilities (10). However, according to some unofficial data, the National Organization of People with Disabilities of Serbia gathers more than 870,000 persons with disabilities and their legal representatives, who belong to organizations of people with certain types of disabilities, and also there are organizations of legal representatives of people with disabilities and interest organizations (11). This means that the number of people with disabilities in Serbia in reality is more than 12% of the population. The scientific and technological advance of modern medicine with the application of modern treatment techniques has enabled longer life expectancy with a better prognosis and the quality of life in persons with inborn diseases and conditions (7). Also, the development of contemporary dentistry and the application of modern biocompatible materials that are resistant to moisture, used with numerous behavioral and pharmacological methods enable the significant improvement of cooperation, therapeutic possibilities and therefore, the quality of life in relation to oral health in persons with special needs. Also,

primena modernih materijala otpornih na vlagu, uz brojne bihejvioralne ili farmakološke metode, omogućavaju znatno poboljšanje saradnje, terapijskih mogućnosti, a samim tim i kvaliteta života vezano za oralno zdravlje kod osoba sa posebnim potrebama. Takođe, postoji izražena inicijativa za smanjenjem stigmatizacije i unapređenjem socijalne inkluzije uz postizanje zadovoljavajuće facijalne estetike. Upravo ovi razlozi dovode do velike verovatnoće da će stomatolozi na svim nivoima zdravstvene zaštite već tokom svoje rane karijere biti u situaciji da pruže stomatološki tretman pripadniku ove osetljive i stigmatizovane grupe (8). Bitno je istaći značaj obuke budućih mladih stomatologa, jer se jedino na taj način sigurno obezbeđuje bolja dostupnost stomatološke zdravstvene zaštite svima (12).

Takozvani „medicinski model" daje detaljne podatke o pacijentu fokusirajući se na etiopatogenezu oboljenja ili poremećaja, dok su informacije o specifičnim životnim situacijama i iskustvima osobe sa smetnjama u razvoju zanemarene (13). Međutim, savremena obuka zdravstvenih radnika koji se bave pružanjem pomoći osobama sa posebnim potrebama podrazumeva stavljanje osobe, a ne oboljenja u fokus, uz posmatranje disabiliteta u kontekstu telesne funkcije i strukture, i pojedinačnih aktivnosti i učešća – u smislu posmatranja funkcionisanja u odnosu na neposredno ili šire okruženje sa aspekta pojedinca ili sa aspekta čitavog društva (3). Svako dete, pa i ono potpuno zdravo može sa stomatološkog aspekta predstavljati pacijenta sa posebnim potrebama ukoliko zahteva primenu posebnih principa rada i pristupa (npr. pacijenti koji ne sarađuju, sa izraženom anksiozošću, strahom ili fobijom od stomatoloških intervencija). Takođe, posebno osetljivu grupu pacijenata sa posebnim potrebama u stomatološkoj ordinaciji mogu činiti deca koja su pripadnici marginalizovnaih grupa kao što su deca/osobe bez roditeljskog staranja, pripadnici etničkih manjina, imigranti, osobe koje ne govore maternji jezik sredine u kojoj se nalaze, različite rase, veroispovesti, polne pripadnosti, niskog socijalno-ekonomskog statusa, uzrasta, zavisnosti od drugih osoba, i dr (14).

Uloga stomatologa u zdravstvenoj nezi dece sa posebnim potrebama

Deca sa posebnim potrebama mogu doći u stomatološku ordinaciju upućena od strane dečjeg psihologa, pedagoga, stručnog saradnika predškolske ustanove ili pedijatra. Ipak, ponekad, kroz interakciju prilikom stomatološkog tretmana i plana terapije, kao i razgovora sa roditeljima, kroz neposredno posmatranje reakcija deteta u stomatološkoj ordinaciji, dečiji stomatolog može biti u prilici da primeti potrebu za posebnim pristupom ili tražiti dodatnu konsultaciju dečjeg psihologa, psihijatra, ili nadležnog pedijatra. Na taj način se omogućava postizanje zadovoljavajućeg stomatološkog tretmana u saradnji sa stručnjakom iz odgovarajuće oblasti.

Održavanje i unapređenje zdravlja usta i zuba dece sa posebnim potrebama kroz primenu preventivnih, profilaktičkih i terapijskih mera izuzetno je važno, jer oralno zdravlje veoma utiče na kvalitet života i proces socijalne inkluzije (15). Na žalost, stanje oralnog zdravlja često postaje prioritet tek u trenutku kada je potrebno pružiti urgentni stomatološki tretman, zbog bola ili otoka, i kad već u velikoj meri narušava kvalitet života ne samo pacijenta, već i njegove čitave porodice.

Rad na unapređenju i očuvanju oralnog zdravlja dece s posebnim potrebama uključuje rad stomatologa na nivou primarne, sekundarne ili tercijarne zdravstvene zaštite u zavisnosti od potreba pacijenta. Takođe, često je potreban timski rad i multidisciplinarni pristup uz saradnju stručnjaka različitih profila i specijalnosti. Samo takav pristup može dati zadovoljavajuće rezultate. Uloga stomatologa u održavanju i unapređenju zdravlja usta i zuba prvenstveno se ogleda kroz procenu rizika za oralna oboljenja koji su kod osoba sa posebnim potrebama visoki – kontinuirana primena preventivnih i profilaktičkih mera i redovni kontrolni pregledi (svakih 2-3 meseca, a nekada i češće) omogućavaju adaptaciju pacijenata na uslove stomatološke ordinacije, terapeuta i olakšavaju održavanje zadovoljavajućeg stanja oralnog zdravlja (16). Posebno je važno istaći značaj redovne u kontinuirane primene preventivnih i profilaktičkih mera na nivou primarne zdravstvene zaštite kod pacijenata

having in mind strong initiatives to decrease stigmatization of this vulnerable groups, recently parents/caregivers are highly motivated to improvement of social inclusion through achievement of adequate facial esthetics. Due to these reasons, it is likely that dentists at all levels of health care will be in the situation to provide dental treatment for members of this vulnerable and stigmatized group even during the early days of their career (8). It is important to emphasize the significance of undergraduate and postgraduate training of future dentists, because only in this way better availability of dental health care would be provided to everybody (12).

The so called "medical model" gives detailed data about the patient focusing on the etiopathogenesis of disease or disorder, while the information on specific life situations and experience of a person with developmental disabilities have been neglected (13). However, contemporary training of health care workers, who are engaged in providing help to persons with disabilities means placing the person, and not disease into the focus, with the observation of disabilities in the context of physical function and structure, and individual activities and participation – meaning that it is observed how they function in relation to their immediate or wider surroundings from the individual perspective or the perspective of the whole society (3). Every child, even the healthy child can be the patient with special needs from the aspect of dentistry if the application of special principles of work and approach is necessary (e.g. patients who do not cooperate, with the expressed anxiety, fear or phobia of dental interventions). Also, an especially vulnerable group of patients with special needs in the dental office can be children who are members of marginalized groups, such as neglected children, homeless persons, members of ethnic minorities, immigrants, persons who do not speak the language of the linguistic environment where they live, people of different race, religion, gender, low socio-economic status, age, people who depend on others etc (14).

The role of dentists in the health care of children with special needs

Children with special needs may be directed to the dental office by the children's psychologist, pedagogue, professional associate of the pre-school institution or pediatrician. However, sometimes through the interaction during the dental treatment, as well as during the conversation with parents, through the direct observation of children in the dental office, pediatric dentist may notice the need for the special approach or ask for additional consultations with children's psychologist, psychiatrist, or pediatrician. In this way, multidisciplinary treatment and cooperation would make possible dental treatment success.

Maintaining and improving the oral health of children with special needs through the use of preventive, prophylactic and therapeutic measures is of utmost importance, because oral health influences the quality of life and the process of social inclusion (15). Unfortunately, the condition of oral health often becomes priority at the moment when urgent dental treatment is necessary, due to pain or swelling, and when it disturbs, to the great extent, the quality of life not only of patient, but his family, as well.

The work on improving and maintaining the oral health of children with special needs includes the work of dentists at the primary, secondary and tertiary level of health care, depending on patients' needs. Also, team work and multidisciplinary work are often necessary, together with the cooperation of professionals from different fields. Only this approach can give satisfactory results. The role of dentist in maintaining and improving the health of mouth and teeth is mainly reflected in the assessment of risks for oral diseases, which are high in persons with special needs – the continuous application of preventive and prophylactic measures and regular control check-ups (every 2-3 months, sometimes even more frequently) enable patients to adapt to the conditions of dental office, therapist and they mitigate the maintenance of satisfactory oral health condition (16). It is particularly important to emphasize the significance of regular and continuous application of preventive and prophylactic

kod kojih je dobro stanje oralnog zdravlja postignuto sanacijom u tercijarnoj ustanovi (u ambulantnim uslovima, u sedaciji ili u opštoj anesteziji). Na ovaj način se izbegava (ponovno) uvođenje u opštu anesteziju u budućnosti radi kompletne sanacije usta i zuba, što bi neminovno bilo neophodno ukoliko se mere primarne prevencije i profilakse ne bi primenjivale adekvatno i redovno (17). Takođe, česti i redovni stomatološki pregledi i stvaranje dobre saradnje omogućavaju da se patološke promene u usnoj duplji uoče u inicijalnoj fazi kada je moguće primeniti minimalno invazivne terapijske mere. Redovni kontrolni pregledi pružaju priliku da se sprovede motivacija, remotivacija i zdravstvena edukacija roditelja, staratelja, negovatelja i samog pacijenta. Na ovaj način se omogućava blagovremena i adekvatna stomatološka zdravstvena usluga čiji je ishod u skladu sa moralnim i etičkim normama - kod pacijenata sa posebnim potrebama treba da bude isti kao kod zdravih vršnjaka. Takođe, na taj način se smanjuje lista čekanja za sanaciju u opštoj anesteziji.

Disabilitet se ne može posmatrati samo sa medicinskog aspekta, već ima i veoma izraženu socijalnu komponentu (18). Često na saradnju sa stomatologom, osim prisutnih razvojnih smetnji ili opšteg oboljenja, utiče i zdravstvena svest, motivisanost i stav roditelja prema opštem i oralnom zdravlju deteta, kao i socio-ekonomski status porodice (19). Na žalost, najveći broj stomatologa je nedovoljno obučen o posebnim psihološkim strategijama (kao što su primena bihejvioralnih metoda prilikom oblikovanja ponašanja), o karakteristikama i režimima rada u institucijama socijalne zaštite, načinima rešavanja brojnih birokratskih, tehničkih i socijalno ekonomskih problema vezanih za pružanje stomatoloških zdravstvenih usluga osobama koje žive u institucijama i na kraju o strategijama integracije oralnog zdravlja unutar zdravstvenog sistema i sistema socijalne zaštite (20).

Pored potrebe za programskom zaštitom oralnog zdravlja, koja je bazirana na sistemskoj primeni mera primarne prevencije, posebno je važno ukazati na značaj svakog stomatologa, na svakom od tri nivoa zdravstvene zaštite, koji se bavi stomatološkim tretmanom osoba sa posebnim potrebama i izradom individualnog plana terapije (21). Individualni preventivni program za prevenciju oralnih oboljenja kod osoba sa posebnim potrebama predstavlja jasno definisanu primenu specifičnih mera i aktivnosti primarne prevencije prilagođene mogućnostima i individulanim karakteristikama pacijenta. Planiranje individualnog preventivnog programa treba prilagoditi vrsti i težini osnovne bolesti deteta, uslovima u kojima dete boravi, i nivou zdravstvene svesti, obučenosti i motivaciji negovatelja. Preporuka je da se redovni kontrolni pregledi i primena preventivnih i profilaktičkih mera obavlja u zdravstvenoj ustanovi koja je najbliža prebivalištu pacijenta (to je najčešće ustanova primarne zdravstvene zaštite), tako da je iz tehničkih i ekonomskih razloga negovateljima najčešće najjednostavnije da se pridržavaju režima unapred isplaniranih poseta.

Veliki značaj u prevenciji oralnih oboljenja ima zdravstveno-vaspitni rad, odnosno edukacija deteta i roditelja/staratelja da redovno i pravilno održavaju oralnu higijenu. Efikasan, svakodnevni, adekvatan higijensko dijetetski režim kod velikog broja dece sa motornim smetnjama u razvoju i kašnjenjem u intelektualnom razvoju zahteva aktivnu pomoć i kontrolu negovatelja. Kako bi obuka počela što ranije, od posebnog je značaja bliska saradnja sa pediajtrijskom službom na primarnom, sekundarnom i tercijarnom nivou zdravstvene zaštite. Na taj način se omogućava blagovremeno sprovođenje potrebnih preventivnih mera, s obzirom na to da se pacijenti sa posebnim potrebama sa stomatološkog aspekta, svrstavaju u visoko rizične za nastanak oralnih oboljenja (22).

Preporuke za unapređenje i očuvanje oralnog zdravlja dece sa posebnim potrebama

Postoje brojne preporuke, a neke od najvažnijih bile bi sledeće. Prilikom intraoralnog i ekstraoralnog stomatološkog pregleda vrši se procena stanja zdravlja usta i zuba, ali i mogućnost saradnje. Konsultacija sa nadležnim pedijatrom, psihijatrom, psihologom, će omogućiti neophodnu pisanu saglasnost o potrebnoj pripremi pacijenta za stomatološku intervenciju, ali i pružiti mogućnost savetovanja vezano za najbolji pristup koji će biti u skladu sa potrebama i mogućnostima pacijenta.

measures at the level of primary health care in patients, whose good condition of oral health was achieved in the tertiary institution (during dental treatment in general anesthesia, sedation or even using only behavioral methods). In this way, the (repeated) general anesthesia could be avoided, which would be necessary for the complete oral rehabilitation if measures of primary prevention and prophylaxis were not applied regularly and in an adequate way (17). Also, frequent and regular dental check-ups and good cooperation make it possible to notice the initial pathological changes in the oral cavity, when it is possible to apply minimally invasive therapeutic measures. Regular control check-ups offer the opportunity to motivate, re-motivate and educate parents, guardians, caregivers, and patients, as well. In this way, it is possible to achieve the outcome of dental treatment in patients with special needs that is in accordance with moral and ethical norms – it should be the same as in their healthy peers. Also, in this way the waiting list for the treatment in general anesthesia could be substantially reduced.

Disability cannot be analyzed only from the medical aspect, but it also has the pronounced social component (18). The cooperation with dentist, in addition to present developmental difficulties and the main disease, is influenced by health consciousness, motivation and parents' attitude towards general and oral health of their children, as well as by the socio-economic status of that family (19). Unfortunately, the greatest number of dentists are not trained enough about psychological strategies (such as the application of behavioral methods during behavior management), about characteristics and regimes of work in social welfare institutions, ways of solving numerous bureaucratic, technical and socio-economic problems related to dental healthcare services provided to persons who live in institutions and in the end, about strategies for the integration of oral health in the health care system and the system of social protection (20).

There is a strong need for the programmed protection of oral health, which is based on the systematic application of preventive and prophylactic measures on primary health care level. Also, it is of particular importance to point to the significance of good cooperation of each dentist, at all three levels of health care, who treats persons with special needs and designs the individual treatment plan (21). The individual preventive program for the prevention of oral diseases in persons with special needs presents a clearly defined application of specific measures and activities of primary prevention that are adjusted to the abilities and individual characteristics of patients. The plan of the individual preventive program should be adjusted to the type and severity of the main disease, conditions in which a child lives, and to the level of health consciousness, and to the motivation and education of their caregivers. It is recommended that regular control check-up and the application of preventive and prophylactic measures should be done in the health care institution, which is nearest to the patient's place of living (that is most frequently the primary health care institution), and therefore, due to technical and economic reasons it is more convenient for the caregivers to stick to the arranged visits.

Health-education, that is, promoting wellness and educating children and parents/guardians how to regularly maintain oral hygiene is very important for the prevention of oral diseases. Great number of children with difficulties in the development of motor skills and with the delay in the intellectual development demand the active help and control of caregivers. In order to start with the education as soon as possible, the close cooperation with the pediatric department at the primary, secondary and tertiary level of health care is of great importance. In that way, it is made possible that necessary preventive measures are carried out on time, having in mind the fact that patients with special needs from the perspective of dentistry are classified as those having the highest risk of developing oral diseases (22).

Recommendations for improving the oral health of children with special needs

There are numerous recommendations, and some of the most important ones are the following. During the intraoral and extraoral dental examination, the condition of oral health is estimated, as well as the possibility for cooperation. Consultations with the pediatrician,

Primena preventivnih saveta i profilaktičkih mera kroz preventivne posete će omogućiti očuvanje i unapređenje oralnog zdravlja, motivaciju i remotivaciju pacijenta i roditelja (staratelja ili pratioca, negovatelja), ali i upoznavanje sa psihosocijalnim i medicinskim individualnim karakteristikama pacijenta. Zdravstveno vaspitni rad sa decom sa posebnim potrebama i njihovim pratiocima podrazumeva primenu uobičajenih tehnika (reci-pokaži-uradi) za mehaničko i hemijsko uklanjanje oralnog biofilma u kućnim uslovima uz dizajniranje najboljeg načina prilagođenog individualnim karakteristikama pacijenta i porodice. Nekada je primena ove metode otežana, jer pacijenti mogu imati i usporen intelektualni razvoj ili nerazvijenost govora, pa je tada preporučeno koristiti neku od metoda koje su prilagođene mogućnostima pacijenta (17).

Potrebno je ohrabriti roditelje da pronađu stimulišući način za postepeno uvođenje osnovnih sredstava za održavanje oralne higijene (manuelna ili električna četkica za zube), a zatim postepeno i ostalih osnovnih sredstava za održavanje oralne higijene (na primer konac za zube). Pri tome se preporučuje podrška i zajednički napor stomatologa i članova porodice prilikom osmišljavanja strategije, u smislu izbora sredstva za održavanje oralne higijene, prijatnog mesta gde će se održavati oralna higijena svakodnevno i načina potkrepljivanja nagradama. Preporučuje se redovna upotreba preparata s fluoridima i drugih hemioprofilaktičkih sredstava uz adekvatnu i detaljnu obuku negovatelja za primenu ovih sredstava (23).

Ukoliko pacijent nije razvio refleks pljuvanja zbog poteškoća u psihomotornom razvoju, roditelja treba posavetovati da četkicom za zube izvrši premazivanje površina zuba i usne duplje hemioprofilaktičkim sredstvom. Preporuka je da se prva preventivna stomatološka poseta obavi do uzrasta od godinu dana, a posebno je važno uspostaviti dobru saradnju dečjeg stomatologa i pedijatra i uvesti rane preventivne posete, odmah po uspostavljanju dijagnoze opšteg oboljenja (24). Redovni preventivni kontrolni pregledi i profilaktičke posete se preporučuju 4 puta godišnje, ili češće, kod pacijenata sa visokim rizikom za nastanak karijesa, kao što su sva deca sa smetnjama u razvoju ili opštim oboljenjem (22).

Za dugotrajnu prevenciju oralnih oboljenja veliku važnost ima pravilan način ishrane imajući u vidu da loše navike u ishrani štete i oralnom i opštem zdravlju na dugoročnom nivou (25). Poseta stomatologu i anketa o ishrani može poslužiti kao odlična prilika za skrining rizika za gojaznost, i uput nutricionisti ili pedijatru (26). Prema preporukama Američke akademije za pedijatriju voćni sok ne treba uvoditi detetu u ishranu pre prve godine, a količina zaslađenih napitaka koju dete konzumira treba da bude ograničena na oko 120 ml dnevno za decu uzrasta 1-3 godine, 120-180 ml dnevno za decu uzrasta 4-6 godina, i 240 ml dnevno za decu i adolescente uzrasta 7-18 godina; takođe se ne preporučuje konzumacija soka ili drugih zaslađenih napitaka kod dece jaslenog i vrtićkog uzrasta iz flašica ili šolja koje omogućavaju laku i učestalu upotrebu (27). Prilikom preventivne stomatološke posete, posebnu pažnju treba obratiti na anketu ishrane kod dece koja boluju od hroničnih bolesti i više puta dnevno, svaki dan konzumiraju per os zaslađene sirupe (26). Takođe, primena multivitaminskih preparata u vidu bombonica, želea i sirupa ne bi smela da zameni svakodnevnu konzumaciju zdrave hrane koja zapravo na najbolji način obezbeđuje potrebnu količinu vitamina (28).

Zbog poteškoća u funkcionisanju i učestvovanju u aktivnostima, deca sa posebnim potrebama se svrstavaju u pacijente visokog rizika za nastanak karijesa (22). Preporučuje se zalivanje fisura i jamica na svim zdravim zubima, uz korišćenje materijala kao što su glasjonomer cementi velike viskoznosti, s obzirom na lakoću manipulacije, podnošenje vlage, i pozitivan preventivni efekat zbog otpuštanja fluorida (29). Postepeno upoznavanje pacijenta sa tehnikom izvođenja procedure, uz primenu bihejvioralnih metoda, poboljšava saradnju sa pacijentom, omogućava stvaranje odnosa poverenja, što obezbeđuje, pored profilaktičkih, i primenu minimalno invazivnih tretmana u slučaju indikacija. Istraživanje sprovedeno na 66 pacijenata sa posebnim potrebama je pokazalo da su restauracije urađene atraumatskom restaurativnom tehnikom i postavljenim ispunom od viskoznog glasjonomer cementa imale isti ili duži period preživljavanja u poređenju sa konvencionalno preparisanim kavitetima rotirajućim instrumentima i postavljenim kompozitnim ispunima (30).

psychiatrist, psychologist will facilitate the necessary written consent to the preparation of patient for the dental intervention, and also enable the possibility of consultations regarding the best approach, which would be in accordance with patient's needs and abilities.

The application of preventive advice and prophylactic measures through preventive visits will enable the preservation and improvement of oral health, motivation and re-motivation of patients and parents (guardians or companions, caregivers), and it will enable the dentist to get acquainted with the psychosocial and medical individual characteristics of patients. Health-education with children with special needs and their care-givers means the application of common techniques (say-show-do) for the mechanical and chemical removal of oral biofilm at home together with the creation of the best way adjusted to the individual characteristics of patients and family. Sometimes the application of this method is hindered because patients can have a delay in the intellectual development or undeveloped speech, and then it is recommended to use some of the methods that are adjusted to the patient's abilities (17).

It is necessary to encourage parents to find a stimulating way to gradually introduce basic tools for the maintenance of oral hygiene (manual or electric toothbrush), and then gradually the other basic tools for the maintenance of oral hygiene (for example, dental floss). The support and united effort of the dentist and members of family are also recommended when the strategy is planned, in terms of the choice of tools for the maintenance of oral hygiene, the comfortable place where oral hygiene would be maintained every day and the way of rewarding. The regular use of fluoride mouthwash and other chemoprophylactic products together with the adequate and detailed education of caregivers for the application of these means (23).

If the patient has not developed the skills to perform rinse and spit due to the difficulties in psycho-motor development, parents should be advised to spread the chemoprophylactic agent over the surface of teeth and oral cavity with the toothbrush. It is recommended that the first preventive visit to the dentist should be until the age of 12 months, and it is very important to establish the good cooperation between the children's dentist and pediatrician and to introduce early preventive visits immediately after the general disease is diagnosed (24). Regular preventive control check-ups and prophylactic visits are recommended four times a year, or more frequently in patients with the high risk of developing caries, such as all children with developmental difficulties or with general disease (22).

The good nutrition is of great importance for the long-lasting prevention of oral diseases, having in mind the fact that poor eating habits are harmful to both oral and overall health in the long term (25). A visit to the dentist and the questionnaire about diet can be a great opportunity for the screening of risk for obesity, and recommendation to visit nutritionist or pediatrician (26). According to the recommendations of the American Academy for Pediatrics, juice made of fruit should not be introduced into the diet before the first year, while the quantity of sugar-sweetened beverages consumed by children should be limited to about 120 ml daily for the children aged 1-3 years, 120-180 ml daily for the children aged 4-6 years, and 240 ml daily for the children and adolescents aged 7-18 years; also it is recommended that juice or other sweetened beverages should not be consumed from bottles or cups, which enable easy and frequent consummation, in toddlers (27). During the preventive dental visit a special attention should be paid to the questionnaire about nutrition in children who have chronic diseases and who consume *per os* sweetened syrups several times a day and every day (26). Also, the application of multivitamins in the form of gummies, jelly, or syrups should not replace the daily consummation of healthy food, which actually in the best way provides the necessary quantity of vitamins (28).

Due to difficulties in relation to functioning and participating in social activities, children with the special needs are classified into the group of patients with the high risk for the occurrence of caries (22), and therefore, fissure sealants are highly recommended - coating the fissures and small hollows on all healthy teeth with materials such as glass-ionomer cements considering the easy manipulation, moisture tolerance, and positive preventive effect due to the release of fluoride (29). Gradual

Zaključak

Na inkluziju i ostvarivanje ravnopravnosti prilikom stomatološkog rada može se primeniti sličan model kao u inkluzivnom obrazovanju koji je opisala profesorka Džudit Holenveger u UNICEF-ovom stručnom priručniku – razumevanje i prevazilaženje prepreka u neposrednom okruženju koje ometaju učestvovanje predstavlja osnovni preduslov za primenu inkluzije (13): medicinski model odnosno posmatranje osobe kroz dijagnozu, naglašava sve ono što je nemoguće primeniti – nasuprot tome, posmatranje stomatološkog pacijenta kao osobe u centru interesovanja zdravstvenog radnika, kroz njegove mogućnosti, način funkcionisanja, dnevni ritam aktivnosti i aktivno učestvovanje u okruženju omogućava razumevanje i prevazilaženje prepreka.

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informing of patient about the technique used for this procedure with the help of behavioral methods, improves the cooperation with the patient, enables the relationship of trust, which facilitates the application of minimally invasive treatment if necessary, beside the prophylactic treatment. The research, which was conducted on 66 patients with special needs, showed that restorations performed with the help of the atraumatic restorative technique and the filling of viscous glass-ionomer cement had the same or longer period of survival in comparison with the traditionally prepared cavities with the rotating instruments and composite fillings (30).

Conclusion

The similar model as in the inclusive education which was described by the professor Judith Hollenweger in the UNICEF professional booklet, could also be applied to the inclusion, equality and equity during dental work: – understanding and overcoming the obstacles in the immediate surroundings, which hinder the participation, present the main precondition for the application of inclusion (13). Medical model, that is, the observation of one person through his/her diagnosis, emphasizes everything that is impossible to be applied. On the contrary, observing the dental patient as the person in the centre of interest of health care worker, through his/her abilities, the way of functioning, daily rhythm of activities and active participation in the surroundings enables understanding and surmounting the obstacles.

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AKTUELNA TEMA

TELEMEDICINA U DOBA PANDEMIJE KOVID-19

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SAŽETAK

Telemedicina se široko može definisati kao upotreba telekomunikacionih tehnologija za pružanje medicinskih informacija i usluga. Pandemija Kovid-19 je ponovo stavila u fokus korišćenje digitalnih tehnologija u svakodnevnom radu zdravstvenih radnika, a pre svega lekara. Digitalne tehnologije omogućavaju kontakt lekara sa pacijentom preko sigurne mreže bez ličnog kontakta. Usled Kovid-19 pandemije moramo se prilagoditi novonastaloj situaciji. U Crnoj Gori je tokom 2019. godine, počela sa radom platforma *eZdravlje* koja je nadograđivana tokom 2020. godine. Portal *eZdravlje* pruža informacije i omogućava korišćenje elektronskih servisa u zdravstvenom sistemu Crne Gore. Kovid-19 elektronski servis je razvijen tokom pandemije Kovid-19 i namenjen je osiguranicima testiranim na prisustvo novog koronavirusa, a u svrhu dobijanja povratne informacije o rezultatima testiranja. Na taj način, kroz elektronski model najave pacijenta, izabrani lekari su putem informacionog sistema blagovremeno upozoreni na prisustvo SARS-CoV-2 virusa, pre prijema pacijenta u samu ambulantu, što omogućava dodatne mere opreza, odnosno kvalitetniju preventivu i veći stepen zaštite zdravlja lekara i medicinskog osoblja. Cilj ovog rada je da se ukaže na značaj telemedicine u doba pandemije Kovid-19.

Ključne reči: Telemedicina, Kovid-19, zdravstvena zaštita

Uvod

Koronavirusna bolest (Kovid-19) započela je u gradu Vuhanu u Kini u decembru 2019. godine. Kovid-19 pogodio je mnoge zemlje sveta tako da je do danas preko 32 miliona potvrđenih slučajeva i 993.972 smrtnih ishoda u svetu (1). Istovremeno, na globalnom nivou, oporavljeno je preko 24 miliona pacijenata (1). Crna Gora je registrovala prvi slučaj Kovid-19 17.03.2020. godine i bila je poslednja evropska država u kojoj je registrovana infekcija SARS-CoV-2 virusom. Adekvatne mere Vlade Crne Gore, kao i odgovornost građana, doveli su do toga da je 04.05.2020. godine registrovan poslednji slučaj Kovid-19, a dana 24.05.2020. godine izlečen je i poslednji pacijent, tako da je Crne Gora postala prva evropska zemlja bez korona virusa. Međutim, u oktobru 2020. godine situacija je dijametralno suprotna. Trenutno, na dan 26. septembar 2020., Crna Gora ima 3.630 potvrđnih slučajeva Kovid-19, 155 umrlih i ukupno 6.177 oporavljenih (2).

U ovakvoj epidemiološkoj situaciji, u doba pandemije Kovid-19, kada su preporuke relevantnih medicinskih radnika nošenje maski, fizička distanca i higijena ruku, digitalne tehnologije dobijaju sve veći značaj. U svakodnevnoj komunikaciji upotreba *e-mail*-a, *viber*-a, *zoom*-a i *whatsapp*-a je u ekspanziji. Sa jedne strane, to značajno doprinosi smanjenju epidemiološkog rizika, a sa druge, doprinosi razmeni stručnih znanja i veština. Cilj ovog rada je da se ukaže na značaj telemedicine u doba pandemije Kovid-19.

Telemedicina

Telemedicina je, kao sistem pružanja zdravstvene zaštite, definisana od Svetske zdravstvene organizacije (SZO) i to kao praktična zdravstvena zaštita koja koristi interaktivnu zvučnu i vizuelnu komunikaciju i razmenu podataka (3). Globalno društvo nam putem novih tehnologija omogućava da, pre svega, većinu znanja i modele njihove primene

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TELEMEDICINE IN THE COVID-19 PANDEMIC

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SUMMARY

Telemedicine can be broadly defined as the use of telecommunication technologies to provide medical information and services. The COVID-19 pandemic has once again focused on the use of digital technologies in the daily work of health workers, and above all doctors. Digital technologies enable the doctor to contact the patient via a secure network without personal contact. COVID-19 has forced us to adapt to the new situation. In Montenegro, the *eHealth* platform started operating in 2019, and it was upgraded in 2020. The *eHealth* portal provides information and enables the use of electronic services in the health system of Montenegro. The COVID-19 electronic service was developed during the COVID-19 pandemic, and it was intended for the insured people tested for the presence of a new coronavirus, in order to obtain the feedback on test results. In this way, through the electronic model of patient notification, selected doctors are warned on time about the presence of the SARS-CoV-2 virus through the information system, before admitting the patient to the clinic, which allows additional precautions, that is, the better prevention and greater protection of doctors and medical staff. The aim of this paper is to show the importance of telemedicine during the COVID-19 pandemic.

Key words: Telemedicine, COVID-19, health care

Introduction

The coronavirus disease (COVID-19) appeared in the city of Wuhan, in China in December 2019. Covid-19 has hit a lot of countries, so today there are more than 32 million confirmed cases and 993,972 deaths in the world (1). At the same time, at the global level, more than 24 million patients have recovered (1). Montenegro registered the first case of COVID-19 on March 17th, 2020 and it was the last European country, in which the infection of SARS-CoV-2 virus was registered. Adequate measures of the Government of Montenegro, as well as responsible behavior of its citizens, contributed to the fact that the last case of COVID-19 was registered on the 4th of May, 2020, and the last patient was cured on the 24th of May, 2020, and therefore, Montenegro became the first European country without corona virus. However, in October 2020, this situation is diametrically opposed. Currently, on the 26th of September, Montenegro has 3,630 confirmed cases of COVID-19, 155 deaths and 6,177 recovered people (2).

In such an epidemiological situation, in the COVID-19 pandemic, when relevant medical workers recommend wearing masks, physical distance, and hand hygiene, digital technologies are gaining greater importance. In everyday communication, the use of *e-mail*, *Viber*, *Zoom* and *WhatsApp* is on the rise. On the one hand, it significantly contributes to the reduction of epidemiological risk; while on the other hand, it contributes to the exchange of professional knowledge and skills. The aim of this work is to point to the significance of telemedicine in the COVID-19 pandemic.

Telemedicine

Telemedicine was, as a system of providing health care services, defined by the World Health Organization (WHO) as practical health care, which uses interactive sound and visual communication to exchange data (3). The global society enables us, with the help of these technologies, to find the majority of knowledge and models of its application in one place (4). The level of the application of information

pronađemo na jednom mestu (4). Nivo primene informacionih tehnologija u savremenim zdravstvenim sistemima kontinuirano raste u celom svetu. Iako medicinski informacioni sistemi nisu novina, sa tehnološke tačke gledišta, trend njihove efektivne i masovne upotrebe traje tek poslednjih petnaest godina.

Medicinski informacioni sistem (MIS) značajno unapređuje rad zdravstvenih ustanova kroz povećanje efikasnosti, manji obim rada sa dokumentacijom, vođenjem evidencije o svim segmentima zdravstvene zaštite itd. Međutim, pored osnovne uloge u zdravstvu, pravilno projektovan i implementiran MIS treba da doprinese i značajnom unapređenju edukacije i istraživanja (5).

Zdravstveni informacioni sistem (ZIS) je integrisani komunikacioni računarski sistem za razmenu informacija u procesu zdravstvene zaštite, čiji su korisnici (svi) zdravstveni radnici i (svi) korisnici zdravstvene zaštite (6). Ovim sistemom se obuhvataju sve informacije koje se tiču pitanja zdravlja jedne populacije ili, još bolje, populacije na svetskom nivou (7). Telemedicina pruža mogućnost da se zdravstveni sistem orijentiše na pacijenta i porodicu, tj. da smanji njegovu mobilnost u cilju rasterećenja zdravstvenog sistema, a pacijentu da omogući što bolju i kvalitetniju zdravstvenu zaštitu (8). Pandemije i druge vanredne situacije u javnom zdravstvu obično dovode do rasta potražnje za medicinskom negom, što prevazilazi lokalne mogućnosti.

Telemedicina se, u širem smislu, može definisati kao upotreba telekomunikacionih tehnologija za pružanje medicinskih informacija i usluga. Blagodati telemedicine u ovim situacijama dobro su dokumentovane (9). Telemedicina može podržati kliničku negu, obrazovanje i zdravstvo na daljinu, a njena upotreba dramatično se povećala u poslednjoj deceniji (10). Postoji niz potencijalnih koristi od primene telemedicine i to: olakšan pristup informacijama, poboljšani pristup uslugama i bolja dostupnost nege koja se ranije nije mogla pružiti, unapređeno profesionalno obrazovanje, i smanjenje troškova zdravstvene zaštite.

Prema SZO telemedicina predstavlja pružanje zdravstvene zaštite uz upotrebu informatičke i komunikacijske tehnologije (ICT) za potrebe dijagnostike, terapije, prevencije bolesti i traumatizma, istraživanja i evaluacije, te za potrebe kontinuirane edukacije zdravstvenog osoblja, a sve u interesu unapređenja zdravlja, kako pojedinaca tako i zajednice. *Telehealth*, izraz koji se koristi naizmenično s telemedicinom, definisan je kao pružanje zdravstvene zaštite na daljinu pomoću telekomunikacione tehnologije, a sve u cilju poboljšanja zdravlja pacijenta (11).

Vrste modela telemedicine

Sinhronizovani model telemedicine – telefonska ili audio-video interakcija u stvarnom vremenu, obično s pacijentom, ali je moguće i sa porodicom, pomoću pametnog telefona, tableta ili računara. Ovaj način komunikacije može da se koristiti za prikupljanje podataka od pacijenata obolelih od Kovid-19 kako bi se utvrdilo s kim su bili u kontaktu za vreme dok su bili potencijalno zarazni, kao i za praćenje njihovih kontakata, kako bi ih obavestili o potrebi samoizolacije. Pacijenti sa blagim ili umerenim simptomima Kovid-19 često se mogu izolovati i nadzirati dok su u kućnim uslovima, kako bi se izbegla prenatrpanost zdravstvenih ustanova i kako bi se obezbedili bolnički kreveti za teže slučajeve. Koristeći digitalne tehnologije, kao što su telefoni ili aplikacije, lekari mogu češće da komuniciraju sa pacijentima, kako bi nadzirali njihovo zdravstveno stanje, davali savete i procenili težinu kliničke slike bolesti, radi pužanja adekvatne zdravstvene nege u zdravstvenoj ustanovi. Nakon otpuštanja pacijenata s Kovid-19 iz bolnice, pružaoci zdravstvenih usluga mogu koristiti telemedicinu kako bi pratili zdravstveno stanje pacijenata u samoizolaciji u kućnim uslovima.

Asinhronizovani model telemedicine – komunikacija lekara i pacijenta ne događa se u stvarnom vremenu. Na primer, tehnologija „spremi i prosledi" omogućava prikupljanje poruka, slika ili podataka u određenom trenutku i njihovo tumačenje ili odgovaranje na njih kasnije. Portali za pacijente mogu olakšati ovu vrstu komunikacije između lekara i pacijenta putem sigurnih poruka.

Praćenje pacijenta na daljinu omogućava direktan prenos lekaru svih kliničkih merenja pacijenta (može ili ne mora biti u stvarnom vremenu) (12).

technologies in contemporary health care systems continually increases in the whole world. Although medical information systems are not a novelty, from the technological point of view, the trend of their effective and mass usage has lasted for fifteen years.

Medical information system (MIS) significantly improves the work of health care institutions through the increase of efficiency, decrease in the scope of work with documentation, keeping evidence about all segments of health care, etc. However, besides the basic role in health care, a properly designed and implemented MIS should contribute to the significant promotion of education and research (5).

The health information system is an integrated communication computer system for the exchange of information in the process of health care, whose users are all health care workers and all users of health care (6). This system is comprised of all information connected with the health of one population or the world's population (7). Telemedicine offers the possibility to focus the health care system on the patient and his family, that is, to reduce the mobility in order to reduce the burden on the health care system, and improve health care quality (8). The pandemics and other emergency situations in public health care usually lead to the growth of demand for medical care, which exceeds the local abilities.

Telemedicine can widely be defined as the use of telecommunication technologies for providing medical information and services. The benefits of telemedicine in these situations are well-documented (9). Telemedicine can support clinical care, online education, and health, and its use has dramatically increased in the last decade (10). There is a range of potential benefits from the use of telemedicine and they are the following: improved access to information, improved access to services, and the increase in care, which could not be provided previously better professional education, and the reduction of costs of health care.

According to the WHO, telemedicine presents providing health care with the help of information and communication technologies for the needs of diagnostics, therapy, prevention of diseases and traumatism, research and evaluation, as well as for the needs of continuous education of medical workers, aimed at promoting the health of individuals, as well as the community. Telehealth, the term which is used alternately with telemedicine, has been defined as providing online health care services with the help of telecommunication technology, aimed at improving the patients' health (11).

Types of telemedicine models

The synchronous model of telemedicine: telephone or audio-visual interaction in real-time, usually with the patient, but possibly with the family, as well with the help of a smartphone, tablet, or computer. This mode of communication can be used for the collection of data from patients with COVID-19, in order to determine their contacts during the time when they were potentially infectious, as well as to observe their contacts in order to inform them about the need for self-isolation. Patients with mild or moderate symptoms of COVID-19 can often be isolated and observed while being at home in order to avoid the overburdening of health care institutions and provide hospital beds for severe cases. By using digital technology, such as telephones and applications, doctors can communicate more frequently with their patients in order to supervise their health condition, give advice or estimate the severity of clinical picture, to provide appropriate health care in the health care institution. After the patients with COVID-19 are discharged from the hospital, providers of health care can use telemedicine to observe the health condition of patients, who are in self-isolation at home.

The asynchronous model of telemedicine: communication between doctors and patients does not unfold in real-time. For example, technology "store-and-forward" makes it possible to collect messages, pictures, and data at some moment and to interpret and respond to them later. Portals for patients can facilitate this kind of communication between doctors and patients with the help of secure messages.

Online observation of patients facilitates the direct transmission of the patient's clinical measurements to his doctor (it can be or does not have to be in real-time) (12).

Telemedicina i Kovid-19

SZO je 11. marta 2020. proglasila pandemiju Kovid-19 uzrokovanu novim koronavirusom (SARS-CoV-2) (13). Pandemija Kovid-19 je ponovo stavila u fokus korišćenje digitalnih tehnologija u svakodnevnom radu zdravstvenih radnika, a pre svega lekara. Iako je telemedicina već napredovala u razvijenim zemljama, verovatno još uvek nije pronašla čvrsto uporište u zemljama s ograničenim resursima. Digitalne tehnologije omogućavaju kontakt lekara sa pacijentom preko sigurne mreže bez ličnog kontakta. Kovid-19 nas je naterao na promene, ili je možda bolje reći da se moramo prilagoditi novonastaloj situaciji (14).

Tokom 2016. godine samo je 11,8% porodičnih lekara i pedijatara u Sjedinjenim Američkim Državama koristilo telemedicinu. Međutim, nakon dva meseca od početka pandemije Kovid-19, samo 9% lekara primarne zdravstvene zaštite koji su radili u ordinaciji nije koristilo telemedicinu (15). Informacione tehnologije su pomagale, ali i dalje pomažu, zdravstvenim radnicima tokom ove pandemije. Lekarima je omogućeno da imaju uvid u zdravstveno stanje pacijenta sa sumnjom na infekciju SARS-CoV-2 virusom pre nego što dođu do lekara i usmere se na dalje lečenje.

Platforma *eZdravlje*

Konsultacije lekara sa pacijentom nisu jedina mogućnost koju pružaju digitalne tehnologije u zdravstvu. U Crnoj Gori je tokom 2019. godine počela sa radom platforma eZdravlje koja je nadograđivana tokom 2020. godine. Portal *eZdravlje* omogućava korišćenje i pruža informacije o elektronskim servisima u zdravstvenom sistemu Crne Gore. Kovid-19-elektronski servis razvijen je u vreme pandemije Kovid-19. Namenjen je osiguranicima testiranim na prisustvo novog koronavirusa, a u svrhu dobijanja povratne informacije o rezultatima testiranja. Zahvaljujući strukturi i apsolutnoj integralnosti zdrvstvenog informacionog sistema, informacije o rezultatima testiranja na novi korona virus su dostupne i izabranim doktorima na primarnom nivou. Na taj način kroz elektronski model najave pacijenta, izabrani lekari putem informacionog sistema su blagovremeno upozoreni na prisustvo virusa, pre prijema pacijenta u samu ambulantu, što omogućava dodatne mere opreza, odnosno kvalitetniju preventivu i veći stepen zaštite zdravlja lekara i medicinskog osoblja (16). Zahvaljujući platformi, izbegnuto je više od pola miliona kontakata između pacijenata i zdravstvenog osoblja od početka epidemije, čime se znatno uticalo na sprečavanje širenja Kovid-19 u Crnoj Gori.

U vremenu pandemje dodatni izazov je kontinuirano pružanje zdravstvene zaštite pacijentima koji nisu inficirani SARS-CoV-2 virusom. Telemedicina se može koristiti kao strategija za održavanje kontinuiteta zdravstvene nege, u meri u kojoj je to moguće, kako bi se izbegle negativne posledice odlaganja preventivne, hronične ili rutinske zdravstvene nege, zbog zabrinutosti za Kovid-19. Koriščenjem telemedicine lekar može odrediti kada je najbolje za pacijenta da dođe na pregled u zdravstvenu ustanovu, a sve u cilju smanjivanja nepotrebnih dolazaka pacijenata u zdravstvene ustanove. Lekari mogu koristiti elektronske recepte i pružati višemesečno izdavanje lekova kako bi se dodatno smanjila potreba za dolaskom pacijenata u ordinaciju. Daljinski pristup, takođe, može osigurati dostupnost zdravstvene zaštite kada dolazak pacijenta nije praktičan zbog zabrinutosti za Kovid-19. Da bi se ublažio stres tokom Kovid-19, stanovništvu treba da se pružaju usluge od strane psihologa.

Ograničenja korišćenja telemedicine

U hitnim slučajevima, u uslovima stanja pacijenta koja zahtevaju klinički pregled, radiološko ili laboratorijsko ispitivanje, ne možemo koristiti telemedicinu, bez obzira da li je pacijent oboleo od Kovid-19 ili ne. Takođe, ograničavajući faktor za korišćenje telemedicine može biti i dostupnost uređaja ili internet veza. Ovo se posebno odnosi na pacijente koji žive u ruralnim predelima. Stanovništvo starije životne dobi je steklo naviku odlaska lekaru u ordinaciju, pa samim tim i na razgovor licem u lice. Ta kulturološka navika, kao i životna dob pacijenata, predstavljaju faktore koji mogu da utiču na manje korišćenje mogućnosti telemedicine.

Zaključak

U doba pandemije Kovid-19 obaveza svih donosilaca politike i odluka je da na najbolji

Telemedicine and Covid-19

The World Health Organization declared the pandemic of COVID-19 caused by the novel coronavirus (SARS-CoV-2) on the 11th March 2020 (13). The COVID-19 pandemic has brought the use of digital technologies into focus in the everyday work of healthcare workers, first of all, doctors. Although telemedicine has already made progress in the developed countries, it has not found its anchor-hold in countries with limited resources. Digital technologies facilitate patient-doctor contact via a secure network without personal contact. COVID-19 has forced us to change, or it is better to say, to adapt to the new situation (14).

During 2016, only 11.8% of family doctors and pediatricians in the United States of America used telemedicine. However, two months after the beginning of the COVID-19 pandemic, only 9% of primary health care doctors, who worked in the medical office, did not use telemedicine (15). Information technologies have helped, and they are still helping the health care workers during this pandemic. Doctors are enabled to have insight into the health condition of patients, who are suspicious of SARS-CoV-2 infection before they come to the doctor and get directed to further treatment.

Platform *eHealth*

Consultations with a doctor are not the only possibility provided by digital technologies in health care. In Montenegro, the platform *eHealth* started working during 2019, and it was updated during 2020. The portal *eHealth* facilitates the usage and provides information about electronic services in the health care system of Montenegro. The COVID-19 electronic system was developed during the COVID-19 pandemic. It is intended for the insured people tested for the presence of the novel coronavirus, with the aim of getting feedback information about the test results. Due to its structure and absolute integrality of the health care information system, information about the test results for the novel coronavirus is available to the chosen doctor at the primary level of health care. Thus, through the electronic patient notification, chosen doctors are via this information system warned about the presence of a virus on time, before they receive patients in the medical office, and therefore, additional precautions can be applied, that is, better quality prevention and a higher level of protection of the health of doctors and medical workers (16). Thanks to this platform, more than half a million contacts between patients and health care workers have been avoided from the beginning of the epidemic, which influenced significantly the prevention of the spread of COVID-19 in Montenegro.

In the time of this pandemic, providing continuous health care to patients, who were not infected with the SARS-CoV-2 virus, presents an additional challenge. Telemedicine can be used as a strategy for maintaining the continuity of health care, to the extent which is possible, in order to avoid the negative consequences of preventive, chronic, or routine health care, which could be postponed due to concerns about COVID-19. By using telemedicine, a doctor can determine when is best for the patient to come to the health care institution, which is aimed at reducing the unnecessary coming to health care institutions. Doctors can use electronic prescriptions and prescribe medicines for several months in order to additionally reduce the patients' need to come to the doctor's office. The online approach can also secure access to health care when coming is not practical for patients due to concerns about COVID-19. In order to alleviate stress during COVID-19, psychologists should provide their services to the population.

Limitations of telemedicine

In urgent cases, when the patient's condition demands clinical examination, telemedicine cannot be used for the radiological or laboratory examination, no matter whether the patient is infected with COVID-19 or not. Also, the limiting factor for the use of telemedicine can be the availability of devices or Internet connection. This especially relates to patients who live in rural areas. The elderly have the habit of going to the doctor's office and talking with their doctor in person. This cultural habit and the patient's age are factors, which can influence the lesser use of telemedicine.

način organizuju pružanje sigurne zdravstvene zaštite. Imajući u vidu preporuke za sprečavanje širenja Kovid-19 (fizička distanca, nošenje maski i higijena ruku), neophodna je implementacija i rutinsko korišćenje telemedicine na svim nivoima zdravstvene zaštite. Međutim, treba imati u vidu da nisu svi zdravstveni radnici spremni da prihvate koncept telemedicine, kao načina komunikacije sa pacijentom na daljinu. Taj negativan stav može biti uzrokovan nedovoljnim poznavanjem digitalnih tehnologija, odnosno manjkom digitalne pismenosti, kao i strahom od moguće zloupotrebe. U skladu sa tim, treba pre svega zakonski regulisati i standardizovati usluge koje se mogu pružati putem telemedicine i na koji način (obavezno ostavljanje zapisa na sigurnoj mreži, radi zaštite samih podataka). Na ovaj način će, pre svega pacijenti, a zatim i medicinsko osoblje, biti sigurni da su usluge pružene putem telemedicine i zakonski valjane. Proaktivna, a ne reaktivna, primena telemedicine, će dugoročno doneti korist i pomoći u svakodnevnim izazovima u zdravstvenim sistemima.

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Conclusion

In the time of the COVID-19 pandemic, the obligation of all policy and decision-makers is to organize secure health care in the best possible way. Having in mind recommendations for the prevention of the spread of COVID-19 (physical distance, wearing masks, hygiene of hands), the implementation and routine usage of telemedicine are necessary at all levels of health care. However, one should have in mind that not all health care workers are ready to accept the concept of telemedicine, as a way of online communication with a patient. This negative approach can be caused by insufficient knowledge of digital technologies, that is, the lack of digital literacy, as well as the fear of possible abuse. In accordance with that, services, which are provided with the help of telemedicine, should be, first of all, legally regulated and standardized and the ways in which it is done should be specified (the written track should necessarily be left on the secure network so that data would be protected). In this way, primarily patients, and then medical personnel as well, will be sure that services provided with the help of telemedicine are legally valid. The proactive and not reactive application of telemedicine will bring long-term benefits and help in the everyday challenges in the health care systems.

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ZDRAVSTVENA PISMENOST I FAKTORI KOJI JE ODREĐUJU

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SAŽETAK

Svetska zdravstvena organizacija definiše zdravstvenu pismenost kao kognitivne i socijalne veštine i sposobnost pristupa, razumevanja i korišćenja informacija na način koji promoviše i štiti zdravlje ljudi. Osobe koje imaju viši novo zdravstvene pismenosti odgovornije su za svoje i porodično zdravlje, kao i za zdravlje svoje zajednice. Zdravstveni radnici i istraživači, kao i kreatori zdravstvene politike, prepoznali su potrebu da se fokusiraju na zdravstvenu pismenost kao mogući faktor kojim se mogu smanjiti zdravstvene razlike. Međutim, precizna priroda odnosa između zdravstvene pismenosti i faktora koji je određuju i dalje je prilično nejasna.

Ključne reči: zdravstvena pismenost, nejednakosti u zdravlju, javno zdravlje

Uvod

Zdravstvena pismenost je termin od sve većeg značaja u javnom zdravlju i zdravstvenoj zaštiti. Uveden je sedemdesetih godina prošlog veka. Odnosi se na kapacitete ljudi da zadovolje složene zahteve zdravlja u modernom društvu (1). Zdravstvena pismenost podrazumeva stavljanje vlastitog zdravlja i zdravlja svoje porodice i zajednice u kontekst razumevanja faktora koji utiču na njega i znanja o tome kako se njima baviti. Osobe koje imaju viši nivo zdravstvene pismenosti odgovornije su za svoje i porodično zdravlje, kao i zdravlje svoje zajednice (2). Kako se zdravstvena pismenost smatra determinantom socijalnog zdravlja koja utiče na poboljšanje zdravlja, osnaživanje pacijenata i smanjenje nejednakosti u zdravlju, od vitalne su važnosti da se preduzmu neophodni koraci za povećanje zdravstvene pismenosti na individualnom, organizacionom, društvenom, regionalnom i nacionalnom nivou. Iako je u mnogim zemljama obezbeđen opšti uvid o trenutnom stanju zdravstvene pismenosti, kako bi se promovisalo zdravlje u zajednici, zdravstvena pismenost mora da bude prioritetni cilj u nacionalnim zdravstvenim politikama širom sveta, a vlade zemalja treba da usvoje programe za poboljšanje zdravstvene pismenosti (3). Zdravstveni radnici i istraživači, kao i kreatori zdravstvene politike, prepoznali su potrebu da se fokusiraju na zdravstvenu pismenost kao mogući faktor kojim se mogu smanjiti zdravstvene razlike. Međutim, precizna priroda odnosa između zdravstvene pismenosti i socioekonomskih faktora i, sledstveno tome, potencijalna pitanja kako zdravstvena pismenost doprinosi disparitetima u zdravlju, i dalje su prilično nejasna. Upravo zbog svega navedenog, cilj ovog rada je bio da se sagleda značaj zdravstvene pismenosti za javno zdravlje i faktori koji je određuju.

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SUMMARY

The World Health Organization defines health literacy as cognitive and social skills and the capacity to access, understand and use information in a way that promotes and protects human health. People who have higher levels of health literacy are more responsible for their health, family health and the health of their community. Healthcare professionals and researchers, as well as health policy makers, have recognized the need to focus on health literacy as a possible factor in reducing health disparities. However, the precise nature of the relationship between health literacy and the factors that determine it, is still rather unclear.

Key words: Health literacy, health disparities, public health

Introduction

Health literacy is a term of increasing importance in public health and health care. The term was introduced in the 1970s. It deals with the capacities of people to meet the complex demands of health in modern society (1). Health literacy means placing one's own health and the health of one's family and community into the context of understanding which factors influence it and knowing how to address them. People, who have higher levels of health literacy, are more responsible for their health, the health of their family and community (2). Since health literacy is deemed to be a determinant of social health, which has an influence on the improvement of health, the empowerment of patients and reduction of disparities regarding health, it is of key importance to take the necessary steps to increase health literacy at the individual, organizational, social, regional and national level. Although the general insight into the current state of health literacy was provided in many countries in order to promote health in the community, health literacy has to be the priority in national health policies around the world, while the governments should adopt the programs for improving health literacy (3). Healthcare workers and researchers, as well as health policymakers, have recognized the need to focus on health literacy as a possible factor in reducing health disparities. However, the precise nature of this relationship between health literacy and socioeconomic factors, and consequently potential questions on how health literacy contributes to disparities regarding health, are still rather unclear.

Health literacy – term and definition

Health ability is the ability of an individual to collect, analyze and understand information in relation to health and services necessary for making the right decisions regarding health (1).

The World Health Organization defines health literacy as cognitive and social skills

Zdravstvena pismenost - pojam i definicija

Sposobnost pojedinca da prikupi, obradi i razume informacije koje se odnose na zdravlje i usluge neophodne za donošenje ispravnih odluka u vezi sa zdravljem, predstavlja zdravstvenu pismenost (1).

Svetska zdravstvena organizacija je zdravstvenu pismenost definisala kao kognitivne i socijalne veštine i kapacitete potrebne za pristup, razumevanje i korišćenje informacija na način koji promoviše i štiti dobro zdravlje. Može se definisati i kao sposobnost građana da donose zdravu odluku koja se tiče zdravlja u svakodnevnom životu (1,2).

Važno je razlikovati zdravstvenu pismenost od opšte pismenosti. Prema Organizaciji za obrazovanje, nauku i kulturu Ujedinjenih nacija (UNESCO), reč „pismeni" uglavnom je značila da je „upoznata sa književnošću" ili opšte „dobro obrazovanim, naučenim", odnosno na sposobnost čitanja i pisanja teksta. Poslednjih godina fokus se dalje proširio, tako da se pismenost ne odnosi samo na individualnu transformaciju, već i na kontekstualnu i društvenu transformaciju u smislu povezivanja zdravstvene pismenosti sa ekonomskim rastom i društveno-kulturnim i političkim promenama (4).

Brojne studije su pokazale da nizak nivo zdravstvene pismenosti uslovljava: češće korišćenje hitnih sužbi i učestalije korišćenje lekova, povećava rizik za bolničkim lečenjem, kao i otežan pristup odgovarajućim zdravstvenim uslugama (3), niži nivo samoprocene zdravlja, veću smrtnost starijih osoba, češće korišćenje zdravstvene službe, slabiju sposobnost tumačenja zdravstvenih poruka i upravljanja hroničnim bolestima (4,5). On, takođe, utiče na sposobnost osobe da se angažuje u okviru preventivnih aktivnosti (6). Ograničena zdravstvena pismenost može imati negativne posledice po zdravstvene ishode zbog nedostatka znanja o prednostima izbora zdravog načina života i preventivnih usluga, što povećava ukupne troškove zdravstvene zaštite (7). Istraživanja u svetu pokazuju da je nivo zdravstvene pismenosti direktno povezan sa uspešnošću komunikacije između pacijenata i zdravstvenih stručnjaka i ishodima lečenja i da u značajnoj meri utiče na kvalitet zdravstvene zaštite (8). Podaci govore da preko 50% pacijenata ne razume uputstva lekara i da su pisani informativni materijali za pacijente preteški za razumevanje, što ukazuje na važnu činjenicu da težina sadržaja pisanih materijala za pacijente nije prilagođena nivou njihove zdravstvene pismenosti (9), što utiče na uspešnost komunikacije između pacijenata i zdravstvenih stručnjaka, na ishode lečenja, a samim tim i na kvalitet zdravstvene zaštite (10).

Kako bi se pojasnilo značenje zdravstvene pismenosti, i njen uticaj na zdravlje, konstruisan je veliki broj istraživačkih alata, odnosno testova, koji služe za procenu zdravstvene pismenosti. Najčešće primenjivani su: TOFHLA (engl. *Test of Functional Health Literacy in Adults*), REALM (engl. *Rapid Estimate of Adult Literacy in Medicine*), WRAT (engl. *Wide Range Achievement Test*), HLS.EU.Q (engl. *European Health Literacy Survey*), BRIEF (engl. *BRIEF–Health Literacy Screening Tool*), HLQ (engl. *Health Literacy Questionnaire*), AAHLS (engl. *All Aspects of Health Literacy Scale*), DAHL (engl. *Demographic Assessment of Health Literacy*) i HELMA (engl. *Health Literacy Measure for Adolescents*) (11,12).

Zdravstvena pismenost i faktori koji je određuju

Zdravstvena pismenost, kao mogućnost funkcionisanja u sistemu zdravstvene zaštite, podjednako je određena individualnim karakteristikama i veštinama, karakteristikama zdravstvenog i obrazovnog sistema, kao i širokim spektrom socijalnih i kulturalnih faktora (13,14). Većina studija je istraživala zdravstvenu pismenost u odnosu na demografske i socioekonomske faktore (pol, starost, rasu i etničku pripadnost, stepen obrazovanja, zanimanje, zaposlenost, dohodak, kultura, jezik), način samoprocene zdravlja, korišćenje lekova, zdravstvene ishode, postojanje socijalne podrške, kao i porodične i vršnjačke uticaje, ekološke i političke parametre (15,16). Rezultati tih istraživanja pokazuju da je zdravstvena pismenost povezana sa mnogim nejednakostima u zdravstvu i da su pojedinci koji imaju niži nivo zdravstvene pismenosti češće od drugih žrtve društvenih nejednakosti (17). Zdravstvena pismenost utiče na zdravstveno ponašanje i korišćenje zdravstvenih usluga, a samim tim i na zdrav-stvene ishode i troškove u zdravstvu,

and the capacity to access, understand and use information in a way that promotes and protects good health. It can be defined as the ability of citizens to make the right decision regarding health in everyday life (1,2).

It is important to distinguish health literacy from general literacy. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), the word "literate" usually means "educated about literature" or generally "well-educated and learned", that is, "able to read and write". The focus has expanded recently, so that literacy does not relate only to individual transformation, but also to contextual and social transformation in the sense of connecting health literacy with economic growth and socio-cultural and political changes (4).

Numerous studies have shown that the low level of health literacy causes more frequent use of emergency services, increases the risk of hospital treatment, more frequent use of medications, as well as the poor access to appropriate healthcare services (3), a lower level of self-assessment of health, greater mortality of older people, greater use of healthcare services, weaker ability to interpret health messages and to manage chronic diseases (4,5). It also influences the ability of a person to engage in preventive activities (6). Limited health literacy can have negative consequences on the health outcomes due to the lack of knowledge about the advantages of a healthy lifestyle and preventive services, which increases the total expenses of health care (7). The research studies around the world show that the level of health literacy is directly connected with the success of communication between patients and healthcare experts and outcomes of treatment, and that it to the great extent influences the quality of health care (8). Data show that more than 50% of patients do not understand doctors' instructions and that written informative materials are too difficult for patients to comprehend, which points to the fact that the readability of written materials for patients is not adjusted to the level of their health literacy (9), and this influences the success of communication between patients and healthcare experts, the outcomes of treatment, and therefore the quality of health care (10).

In order to explain the meaning of health literacy, and its influence on health, a great number of research tools have been constructed, that is, tests that are used for the assessment of health literacy. The most frequently applied tests are the following: TOFHLA (Test of Functional Health Literacy in Adults), REALM (Rapid Estimate of Adult Literacy in Medicine), WRAT (Wide Range Achievement Test), HLS.EU.Q (European Health Literacy Survey), BRIEF (BRIEF-Health Literacy Screening Tool), HLQ (Health Literacy Questionnaire), AAHLS (All Aspects of Health Literacy Scale), DAHL (Demographic Assessment of Health Literacy) and HELMA (Health Literacy Measure for Adolescents) (11,12).

Health literacy and factors which determine it

Health literacy as a possibility of functioning in the system of health care is equally determined by individual characteristics and skills, characteristics of health care and educational system, as well as the wide spectrum of social and cultural factors (13,14). The majority of studies researched health literacy in relation to demographic and socioeconomic factors (gender, age, race and ethnicity, level of education, occupation, employment, income, culture, language), way of self-assessment of health, use of drugs, health outcomes, existence of social support, as well as family and peer influences, environmental and political parameters (15,16). The results of these studies show that health literacy is associated with many disparities in health care, as well as that persons who have a lower level of health literacy are more frequently victims of social inequalities (17). Health literacy influences health behavior and use of health care services, and therefore, the health outcomes and expenses in health care, firstly due to the decreased use of preventive health care services, rarer participation in screening programs and vaccination, poorer communication with the health care workers, which influences the quality of life in a negative way (10,11).

A lot of studies show that there are gender-related differences regarding the level of health literacy, where women have higher levels of health literacy than men (7). Also, it was noted

najpre zbog manje upotrebe preventivnih zdravstvenih usluga, ređeg učešća u skrining programima i odazivima na vakcinisanje i lošije komunikacije sa zdravstvenim osobljem, što se negativno odražava na kvalitet života (10,11).

Mnoge studije pokazuju da postoje rodne razlike u nivou zdravstvene pismenosti gde žene imaju viši nivo zdravstvene pismenosti od muškaraca (7). Takođe je zabeleženo da je neadekvatan nivo zdravstvene pismenosti češće prisutan kod osoba starije životne dobi (13). Brojna istraživanja su pokazala da je nivo obrazovanja značajna determinanta zdravstvene pismenosti. Uočeno je da ljudi sa višim nivoom obrazovanja (15), kao i sa boljim materijalnim statusom (16), imaju i viši nivo zdravstvene pismenosti.

Rezultati istraživanja zdravstvene pismenosti u Evropi, ističu da oni koji prijavljuju niže obrazovanje i niže prihode obično imaju niži stepen zdravstvene pismenosti. Takođe, najveći procenat ograničene zdravstvene pismenosti je primećen kod osoba koje su se pri samoproceni zdravstvenog stanja izjasnile da imaju veoma loše (78,1%) ili loše zdravlje (71,8%), multimorbiditete (61%), i koje su češće koristile usluge zdravstvene službe (58,9%) (6). Veći procenat ljudi sa ograničenom zdravstvenom pismenošću bio je i među onima sa veoma niskim (73,9%) i niskim socioekonomskim statusom (60%) i kod onih koji imaju između 66 i 75 godina (58,2%) ili 76 ili više godina (60,8%). U odnosu na nivo obrazovanja, ograničena zdravstvena pismenost je najčešće bila prisutna kod ljudi sa najnižim (68%) ili niskim obrazovnim nivoima (57,2%) (6). To je delimično potvrđeno i u zemljama širom Azije ili Bliskog Istoka (17). Dalje, u skladu sa nalazima iz Sjedinjenih Američkih Država (SAD), neke studije ukazuju na činjenicu da je nivo zdravstvene pismenosti generalno niži među doseljeničkom populacijom, u poređenju sa domaćim stanovništvom (18).

Postoje podaci da osobe sa nižim nivooom zdravstvene pismenosti češće prijavljuju depresivne simptome, funkcionalna ograničenja, i hronična oboljenja (poput šećerne bolesti, astme i kardiovaskularnih bolesti). Takođe, takve osobe češće konzumiraju lekove i ne pridržavaju se preporuka koje dobiju od zdravstvenih radnika, najčešće imaju nizak nivo znanja o pitanjima vezanim za zdravlje i ređe učestvuju u odlukama koje se tiču zdravlja (19). Distribucija zdravstvene pismenosti, takođe, varira od jedne do druge kulture. Kulturne razlike u odnosu na stepen zdravstvene pismenosti zabeležene su prilikom upoređivanja različitih regija, zemalja ili jezičkih grupa. Naročito u kontekstu istraživanja zdravstvenih razlika i povezanosti sa heterogenom populacijom, kultura je važan faktor koji treba uzeti u obzir (20).

Istraživanja zdravstvene pismenosti se uglavnom fokusiraju na pojedinačne faktore koji utiču na zdravstvenu pismenost i s tim povezane razlike. Ipak, relativno malo pažnje posvećeno je procenjivanju i potencijalnom razdvajanju odnosa između životnih uslova i zdravstvene pismenosti. Korišćenje socijalnog, ekološkog i integrisanog pristupa društvenim determinantama podržalo bi trenutne napore u rešavanju nedostataka istraživanja u oblasti zdravstvene pismenosti (21,22).

Zaključak

Zdravstvena pismenost predstavlja izazov za javno zdravlje. Unapređenje zdravstvene pismenosti će postepeno omogućiti veću autonomiju i lično osnaživanje, a proces zdravstvene pismenosti može se posmatrati kao deo razvoja pojedinca ka poboljšanju kvaliteta života. Zdravstvena pismenost je sredstvo za poboljšanje osnaživanja ljudi u domenima zdravstvene zaštite, prevencije bolesti i promocije zdravlja. Zdravstvenu pismenost treba shvatiti kao ključnu determinantu zdravlja prilikom formulisanja strategija i akcija za njeno unapređenje.

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that an inadequate level of health literacy is more often present in older people (13). The results of various studies point to the fact that the level of education is an important determinant of health literacy. It was noted that people with higher levels of education have higher levels of health literacy (15). Also, people of better material status have higher levels of health literacy (16).

The results of studies dealing with health literacy in Europe showed that those who reported lower levels of education and lower salaries usually had a lower level of health literacy. Also, the greatest percentage of limited health literacy was noted in people, who during the self-assessment of their health condition, opted for very bad (78.1%) or bad health (71.8%), with multi-morbidities (61%), as well as for those who used the health care services more often (58.9%). The greater percentage of people with limited health literacy was among those with very low (73.9%) and low socioeconomic status (60%) and among people aged between 66 and 75 years (58.2%) or 76 years or older (60.8%). In relation to the level of education, limited health literacy was mostly present in people with the lowest (68%) and low levels of education (57.2%) (6). It was partly confirmed in the countries across Asia and the Middle East (17). Further, in accordance with the findings from the United Stated in America, some studies pointed to the fact that the level of health literacy was generally lower in the population of immigrants than in the native population (18).

There are data that people with lower levels of health literacy report more frequently symptoms of depression, functional limitations, and chronic diseases such as diabetes, asthma, and cardiovascular diseases. Also, such persons use medications more often and they do not adhere to the recommendations which they get from health care workers, they have a low level of knowledge related to issues connected with health and they more rarely participate in decisions which concern health (19). The distribution of health literacy also varies in different cultures. Cultural differences in relation to the level of health literacy were noted when comparing different regions, countries or language groups. Culture is an important factor, which should be taken into account, especially in the context of research of health disparities and connectedness with heterogeneous populations (20).

The research studies of health literacy are mainly focused on separate factors which influence health literacy and differences connected with it. However, little attention has been paid to the estimation and potential separation of the relation between living conditions and health literacy. The use of social, ecological and integrative approaches to social determinants would support current efforts in solving the lack of research in the field of health literacy (21,22).

Conclusion

Health literacy presents a challenge to public health. The improvement of health literacy will gradually enable greater autonomy and personal empowerment of people, while the process of health literacy can be observed as a part of individual development towards the improvement of the quality of life. Health literacy is a means of empowering people in the domain of health care, prevention of disease and promotion of health. Health literacy should be perceived as a key determinant of health during the formulation of strategies and actions for its promotion.

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TEMELJI ASPEKTA ZDRAVSTVENE NEGE I DVESTA GODINA OD ROĐENJA *FLORENCE NIGHTINGALE* 1820 –1910.

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SAŽETAK

Nega bolesnika se prožima kroz istoriju i datira još od postanka čovečanstva pa do danas. Spominje se u crkvenim knjigama i drugim spisima, ali ne kao veština ili nauka, već kao delatnost koja je bila rezervisana za monaštvo, kao i za žene, tj. majke i časne sestre. Nega je prvo bila delatnost, pa veština, da bi krajem dvadesetog veka postala naučna disciplina. Florens Najtingejl (engl. *Florence Nightinglae*) zasigurno je jedna od najznačajnih žena u istoriji sestrinstva, medicine, pa i društva uopšte, jer sa njom počinje razvoj sestrinske profesije koja ima kontinuitet do današnjih dana. Rođena je u Firenci 12. maja 1820. godine, a preminula je u Londonu 13. avgusta 1910. godine. Baveći se sestrinskim pozivom, Florens Najtingejl je ujedno bila negovateljica, organizator, istraživač, statističar, reformator, pisac i učitelj. Reformisala je sestrinstvo i javno zdravlje. Godine 1860. osnovala je školu za medicinske sestre u bolnici Svetog Tome i vodila je računa o svakoj štićenici. Uprkos svim preprekama na koje je nailazila, kao i nezavidnim položajem žena koji je vladao u XIX veku, učinila je ogromne korake koji su kontekst tog poziva zauvek promenili. Imala je presudan uticaj na švajcarskog filantropa Anri Dinana (engl. *Henry Dunant*,1828-1910), koji je nakon toga osnovao Crveni krst. Svetsko udruženje medicinskih sestara je 1867. godine njen rođendan proglasilo službenim „Danom medicinskih sestara". Ona je prva žena kojoj je dodeljen Orden vrline. Kralj Edvard joj je uručio počasno priznanje za životno delo 1908. godine. Napisala je preko 200 knjiga i zakletvu.

„Svoj uspeh pripisujem ovome: nikada nisam davala niti primala izgovore."
Florens Najtingejl

Ključne reči: Florens Najtingejl, sestrinstvo, istorija

Istorija modernog sestrinstva

Utemeljivanje modernog sestrinstva je započelo u Ujedinjenom Kraljevstvu sredinom devetnaestog veka od strane Florens Najtingejl (engl. *Florence Nightinglae*) (slika 1), koja je uvela mnoge reforme u sestrinstvo i javno zdravlje. Pregledni rad tekstova o nezi iz 2010. godine ukazao je na mali broj konsenzusom utvrđenih činjenica o tome šta čini osnovne aspekte nege. Od tada, do danas. došlo je do širenja politika, strateških okvira i istraživanja vezanih za zdravstvenu negu (1). Nejasno je da li je ovo dovelo do veće konceptualne jasnoće zdravstvene nege. Smatra se da je racionalizacija nege usko povezana sa sigurnošću pacijenta i kvalitetom nege. Fenomeni klasifikacije nege su definsani i proučavani iz različitih perspektiva i konteksta (2). Početna, prva faza, istorijskog razvoja zdravstvene nege je trajala dugo i sprovodila se u slučaju povreda koje su nastajale prilikom borbe za opstanak, lova, u međusobnim borbama i sukobima između plemena, prilikom savladavanja prirodnih prepreka, obrade zemlje, u elementarnim nepogodama i slično (3). Druga faza istorijskog razvoja zdravstvene nege započinje u periodu hrišćanstva, kada crkva, odnosno kaluđeri i kaluđerice, neguju bolesnike u manastirima, u bolnicama pri manastirima, u njihovim kućama ili u drugim specijalnim ustanovama iste ili slične namene, kao što su domovi za siročad, stare, duševno poremećene osobe, alkoholičare i drugo (3).

Prve pisane tragove o nezi bolesnika na ovim prostorima nalazimo u Hilandarskom

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FOUNDATIONS OF THE ASPECT OF HEALTH CARE AND TWO HUNDRED YEARS SINCE THE BIRTH OF FLORENCE NIGHTINGALE 1820-1910

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SUMMARY

Nursery has existed throughout history and it dates back to the very beginning of humankind. It was mentioned in church books and other written texts but not as a skill or science, but as an occupation reserved for the members of monastic orders, and also for women, that is, mothers, and nuns. First, nursing was an occupation, then a skill, but at the end of the 20th century, it became a scientific discipline. Florence Nightingale is certainly one of the most significant women in the history of nursing, medicine, and society in general because she is the pioneer of the nursing profession that has continuity up to nowadays. She was born on May 12, 1820, in Florence, Italy and died on August 13, 1910, in London. Florence Nightingale worked as a nurse, organizer, researcher, statistician, reformer, writer and a teacher. She reformed nursery and public health. In 1860, she established the school for nurses within St. Thomas' Hospital and she took care of every protégé. In spite of all obstacles, which she was faced with, and the unenviable position of women in the 19th century, she made a huge move that changed the context of this profession forever. She had a huge influence on the Swiss philanthropist Henry Dunant (1828-1910), who was the founder of The Red Cross. In 1867, the International Council of Nurses proclaimed that her birthday would be the International Nurses Day. She was the first woman who was awarded the Medal of virtues. In 1908, she was conferred the Order of Merit by King Edward. She wrote more than 200 books and the Pledge.

"I appreciate my success to this that I have never made or accept any excuse."
Florence Nightingale

Key words: Florence Nightingale, nursing, history

The history of modern nursing

Modern nursing was established in the United Kingdom in the mid-19th century by Florence Nightingale (Picture 1), who introduced numerous reforms into nursing and public health. A review article about texts on nursing from 2010 pointed to a few facts about what makes the main aspects of nursing, which were established by consensus. Policies, strategic frameworks, and research in relation to health care have developed since then (1). It is still not clear whether this has led to the greater conceptual clarity of health care. The rationalization of care is thought to be tightly connected with the safety of patients and the quality of care. The phenomena of the classification of care were defined and studied from different perspectives and in different contexts (2). The beginning or the first phase of the historical development of health care lasted long and it was conducted in case of injuries, which appeared during the struggle for survival, hunting, struggles and conflicts between tribes, when people tried to overcome natural obstacles, during farming, in natural catastrophes, etc (3). The second phase of the historical development of health care started in the period of Christianity, when the church, that is, monks and nuns took care of patients in monasteries, in hospitals within monasteries, at their homes or other special institutions with the same or similar purpose, such as nursery homes for the orphans, for the old, mentally ill people, alcoholics, etc (3).

Slika 1. Florens Najtingejl, fotografija H. Lenthall, London, 1850 (CCA)
Izvor: https://whoswho.de/medien/wsw/florence_nightingale.jpg/

tipiku Svetog Save. Najstariju srpsku bolnicu za lečenje monaha osnovao je Sveti Sava u manastiru Hilandar 1199. godine (4). Na osnovu dostupnih zapisa može se govoriti da su i muškarci imali mesto u nezi bolesnika, ali njihov doprinos je ipak bio zanemarljiv, uglavnom zbog dominantnog uticaja pokreta ženskih sestara iz XIX veka (5). Neki podaci govore da su muškarci bili negovatelji čak mnogo pre Florens Najtingejl (5).

Dostupna literatura pokazuje da su žene i muškarci iz istih razloga ulazili u sestrinsku profesiju, međutim, razlikovali su se putevi kojima su muškarci dolazili do ove profesije. Feministički sociolozi ukazali su na nesrazmeran broj muškaraca na rukovodećim sestrinskim pozicijama i smatrali su da to može imati negativne posledice za samu profesiju (5). Reforme Florens Najtingejl doprinele su da obrazovanje i obuka muških negovatelja u Engleskoj nisu bili prepoznati, a za većinu bolnica bile su regrutovane samo „medicinske sestre", odnosno žene (6). Nakon Drugog svetskog rata usledio je hronični nedostatak medicinskih sestara, usled širenja alternativnih radnih mogućnosti za žene i rasta opšteg bolničkog sektora. To je dovelo do formalnog prihvatanja obrazovanja i obuke i registracije muškaraca za medicinske tehničare (6). U današnje vreme, iako je došlo do porasta broja muškaraca u ovoj profesiji, oni i dalje predstavljaju manjinu (7,8).

Korišćenje konceptualnih i teorijskih okvira zdravstvene nege pri formiranju obrazovnog kurikuluma sestrinstva, ključno je za zaštitu i očuvanje fokusa i jasnoće posebnog doprinosa sestrinstva zdravstvenoj zaštiti (9). Istorija sestrinstva je gotovo isključivo istorija ženskih dostignuća, uprkos činjenici da su već u četvrtom i petom veku muškarci radili kao medicinske sestre. To pruža uvid u rodnu prirodu sestrinstva i rada sestara u patrijarhalnoj kulturi (10). Neki radovi ukazuju da je istorija upravljanja sestrinstvom u Engleskoj bila mnogo složenija i da nisu u potpunosti objašnjeni brojni faktori koji su je oblikovali tokom istorije (11).

Florens Najtingejl utemeljivač modernog sestrinstva

Rođena je u Firenci 12. maja 1820. godine, a preminula je u Londonu 13. avgusta 1910. godine. Tokom Krimskog rata sa grupom medicinskih sestara bila je u Skadru, gde je primenom određenih preventivnih mera (čista odeća i postelja, odgovarajuća hrana, dovoljan

Figure 1. Florence Nightingale, photo by H. Lenthall, London, 1850 (CCA)
Source: https://whoswho.de/medien/wsw/florence_nightingale.jpg/

The first written texts about nursing care were found in the Hilandar Typikon of Saint Sava. Saint Sava established the first Serbian hospital for the treatment of monks in the monastery Hilandar in 1199 (4). According to the available texts, one may say that men were also engaged in the nursing care of patients, but their contribution was irrelevant, mainly due to the dominant influence of the movement of female nurses from the 19th century (5). There are some data that show that men had been nurses long before Florence Nightingale (5).

Available literature shows that both men and women chose the nursing profession for the same reasons. However, the ways of coming to this profession were different for men. Feminist sociologists pointed to the disproportionate number of men in the leading nursing positions and they thought that it could have negative repercussions for the profession itself (5). Reforms of Florence Nightingale contributed to the fact that education and training of male nurses were not recognized in England, and in most hospitals, only female nurses were recruited (6). After the Second World War, there came to the chronic lack of nurses due to the alternative working opportunities for women and the growth of the general hospital sector. This brought to the formal acceptance of education and training of male medical technicians (6). Nowadays, although there came to an increase of men in this profession, they still remain in the minority (7,8).

The use of conceptual and theoretical frameworks of health care, when the education curriculum for nurses is created, is of key importance for the protection and maintenance of focus and clarity of the special contribution of nursing to the health care (9). The history of nursing is almost exclusively the history of female achievements, despite the fact that men worked as nurses in the fourth and the fifth century. This gives insight into the gender-related nature of nursing and the work of nurses in the patriarchal culture (10). Some studies show that the history of management of nursing was a lot more complex in England and numerous factors, which formed it throughout history, were not completely explained (11).

Florence Nightingale – the founder of modern nursing

She was born in Florence on May 12, 1820, and died in London on August 13, 1910. During

Svečano se obavezujem, pred Bogom i u prisustvu ovog skupa, da ću ceo svoj život provesti u moralnoj čistoti i da ću se odano baviti svojom profesijom.

Ja ću se uzdržavati od bilo kakvog nekontrolisanog postupka sa bolesnikom i neću svesno primeniti lek koji bi mogao štetiti.

Sve što je u mojoj moći učiniću da poboljšam nivo svoje profesije i držaću u tajnosti sve lične informacije koje doznajem prilikom obavljanja moga poziva.

Sa punom lojalnošću, do kraja ću pomagati lekaru u njegovom poslu oko bolesnog čoveka.

Slika 2. Zakletva Florens Najtingejl

prostor za svaki krevet i razmak između kreveta) uspela da redukuje broj umrlih vojnika u ratu (sa 42,7% na 2,2%) (12-15). Nazvana je i „dama sa lampom", jer je noću obilazila ranjenike i bolesnike sa svetiljkom u ruci (16).

Baveći se sestrinskim pozivom, Florens Najtingejl je zadužila čovečanstvo, jer je, pored bavljenja negom i organizacijom sanitetske službe, rodonačelnik statistike praveći grafikone u vidu pite (engl. *pie charts*). Tako je, posle Krimskog rada, ispitivala kakvi su sanitarni uslovi među britanskom vojskom na Istoku i da li mogu dovesti do katastrofalnih posledica na njihovo zdravlje, upravo onih koje je videla u Skadru (17). Zahvaljujući njoj i njenom izuzetnom poznavanju matematike i statistike, tadašnja engleska vlada je bila uverena da se smrtni slučajevi mogu sprečiti odgovarajućim preventivnim merama. Ogroman doprinos je dala i razvoju bolničke statistike, sa ciljem mogućeg rešavanja epidemija u bolnicama.

Poznata je kao prva moderna bolničarka, osnivač službe medicinskih sestara, a posle Krimskog rata (1856. godine) bila je dočekana kao heroina. Iza sebe je ostavila preko 200 knjiga, kao i zakletvu medicinskim sestrama (Slika 2). Bila je reformator zdravstvene nege i promovisala je javno zdravlje. U cilju uvođenja profesionalnog sestrinstva u bolnice osnovala je školu za medicinske sestre u bolnici Svetog Tome u Londonu (1860. godine), a o svakoj polaznici škole se nesebično brinula. Obezbedila je se da u ambulantama popravnih domova obučene medicinske sestre brinu o zdravlju siromašnih, nazaposlenih, invalida, kao i drugih ugroženih kategorija društva. Njeni su prvi udžbenici vezani za negu, higijenu, pedijatriju i ishranu: „Nega bolesnika", „Nega deteta (za majke)", „Nega deteta (za sestre)", i „Higijena rada i ishrana". Jedna od njenih najznačajnijih kniga je „Beleške o sestrinstvu", namenjena kako medicinskim sestrama, tako i ženama koje su se bavile negom u kući (3).

Florens Najtingejl je prva žena koja je dobila Orden vrline. Dala je ogroman doprinos i u razvoju epidemilologije i javnog zdravlja i bila je potpuno posvećena radu i istraživanju u mnogim poljima (16). Bila je među onima koji su smatrali da samo profesionalnom edukacijom sestrinstvo može da postane profesija (16). Njeni saveti su poslužili reformi sestrinske, kao i vojne službe, kako u Engleskoj, tako i u celom svetu (17).

Zaključak

Florens Najtingejl je profesiju medicinke sestre, zasnovanu na znanju i veštinama, učinila dostojanstvenom i vrednom poštovanja. Njene se metode i danas koriste, iako je od njenog rođenja prošlo čak dva veka. Čitav život zalagala se za napredak struke medicinskih sestara, kao i za prava žena. Kako je i sama govorila, napredak sestrinstva postoji isključivo ako se ono svakodnevno unapređuje.

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I solemnly pledge myself before God and in the presence of this assembly to pass my life in purity and to practice my profession faithfully.

I will abstain myself from whatever is deleterious and mischievous, and will not take or knowingly administer any harmful drug.

I will do all in my power to maintain and elevate the standard of my profession and will hold in confidence all personal matters committed to my keeping and all family affairs coming to my knowledge in the practice of my calling.

With loyalty will I aid the physician in his work, and as a missioner of health, I will dedicate myself to devoted service for human welfare.

Picture 2. Florence Nightingale Pledge

the Crimean war, she was with the group of nurses at Scutari, where with the application of certain preventive measures (clean clothes and beds, appropriate food, sufficient space for each bed and space between beds) she managed to reduce the number of soldiers who died in the war (from 42.7% to 2.2%) (12-15). She was given the name "the lady with the lamp", because at night she walked among the beds, checking the wounded men and patients with the lamp in her hand (16).

Humankind is indebted to Florence Nightingale for her nursing work. She dealt with the nursing care and the organization of sanitary service, but she also made graphs, that is, pie charts, and therefore, she is the founder of statistics. After the Crimean War, she examined the conditions among the British soldiers in the East and whether they could have catastrophic consequences for their health, which she had seen at Scutari (17). Thanks to Florence Nightingale and her exceptional knowledge of mathematics and statistics, the British government was assured that deaths could be prevented by appropriate preventive measures. She made a huge contribution to the development of hospital statistics, aimed at solving the possible epidemics within them.

She is known as the first modern nurse, the founder of the service of nurses, and after the Crimean War (in 1856), she was welcomed as the heroine. She left behind more than 200 books and the pledge for nurses (Picture 2). She was the reformer of health care and she promoted public health. With the aim of introducing the professional nursery into hospitals, she established the school for nurses at St. Thomas' Hospital in London (in 1860), and she took care of all students unselfishly. She managed to provide trained nurses to take care of the poor, unemployed, disabled, and other endangered social categories in the ambulance offices of correction homes. The first course books of Florence Nightingale are related to care, hygiene, pediatrics, and nutrition: "Patient Health Care", "Child Health Care (for mothers)", "Child Health Care (for nurses)", and "Hygiene of Work and Diet". One of the most important books is "Notes on Nursing". It was intended for nurses, as well as for women who dealt with health care at home (3).

Florence Nightingale was the first woman who got the Medal of virtues. She made a great contribution to the development of epidemiology and public health and she was completely devoted to work and research in many fields (16). She was among those, who thought that only with the professional education nursing could become the profession (16). Her advice was important for the reform of nursing and military service in England, and in the whole world, as well (17).

Conclusion

Florence Nightingale transformed nursing into a dignified and respectable profession, which was based on knowledge and skills. Her methods are used even today, although two hundred years have passed since her birth. All her life she strived for the development of the nursing profession and for women's rights as well. As she used to say, the progress in nursing

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was possible only if this progress was made every day.

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Parts of the manuscript are: title page, summary in Serbian and English with keywords in Serbian and English, text of the manuscript (Introduction, Methods, Results, Discussion, Conclusion, Literature, Acknowledgment) and appendices.

The manuscript should be written briefly and clearly and abbreviations used only for very long names and for names known as abbreviations (eg AIDS, HIV, etc.).

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