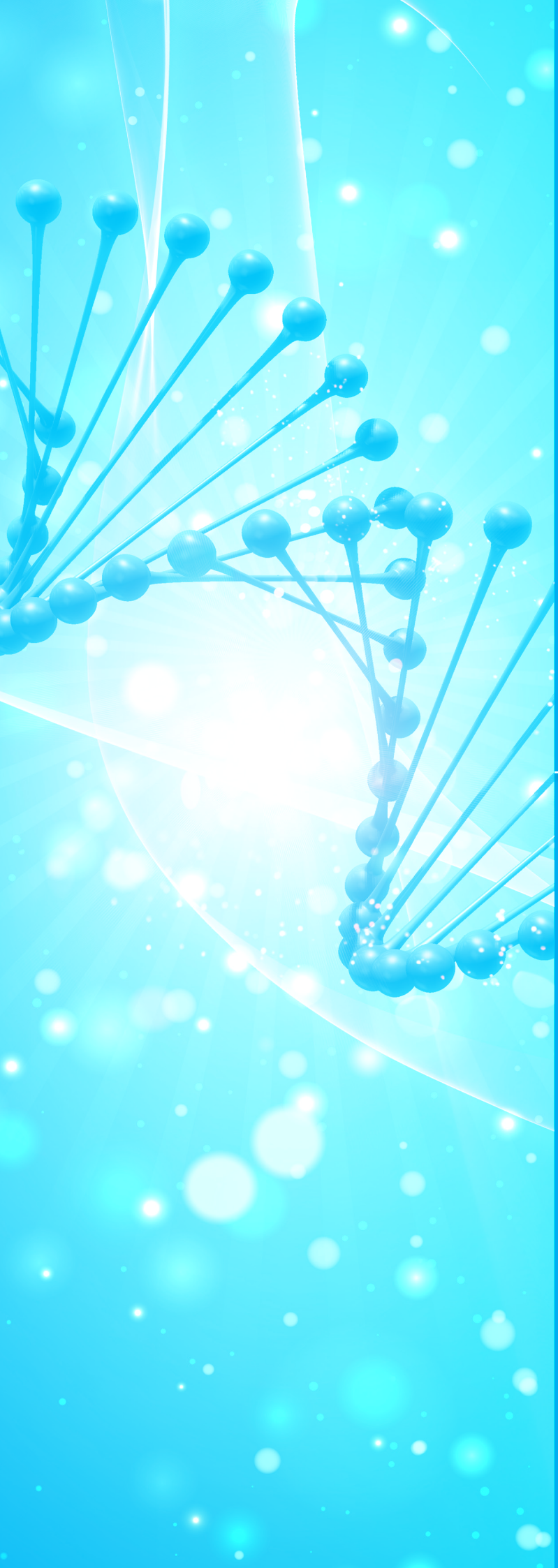

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EPIDEMIOLOŠKE KARAKTERISTIKE EPIDEMIJA BOLESTI ŠAKA, STOPALA I USTA U VRTIĆIMA U BEOGRADU ZA PERIOD 2015 – 2019. GODINE

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SAŽETAK

Uvod/Cilj: Bolest šaka, stopala i usta (engl. *Hand, Foot and Mouth Disease* - HFMD) prvi put je u svetu prijavljena 1957. godine u Kanadi, dok je na teritoriji Beograda prva epidemija ovog oboljena registrovana 2014. godine. Cilj ovoga rada je da se analiziraju epidemiološke karakteristike epidemija HFMD u vrtićima u Beogradu za period od 2015. do 2019. godine.
Metode: Primenjena je deskriptivna epidemiološka studija. Za analizu epidemija korišćeni su podaci iz epidemioloških upitnika i informacije Centra za kontrolu i prevenciju bolesti Gradskog zavoda za javno zdravlje Beograd, medicinska dokumentacija i rezultati virusoloških analiza obavljenih u Referentnoj laboratoriji Instituta za virusologiju, vakcine i serume „Torlak".
Rezultati: U periodu od 2015. do 2019. godine registrovano je 20 epidemija HFMD u kojima je ukupno obolelo 220 dece. Ukupan broj obolele dece u epidemijama se kretao od 9 do 102. Dečaci su neznatno češće obolevali (52%), kao i osobe uzrasta dve godine (51%). Svi oboleli imali su makulopapulozne kožne promene, a veći deo povišenu temperaturu (96%) i malaksalost (68%). Enterovirus je detektovan *Real-Time* PCR metodom kod dva obolela deteta. Bolest nije bila praćena komplikacijama.
Zaključak: Pravovremenom primenom protivepidemijskih mera i to prijavom oboljenja, izolacijom i lečenjem obolelih, poštovanjem mera opšte i lične higijene, kao i merama tekuće dezinfekcije u kolektivu, uspešno se može zaustaviti dalje širenje infekcije.

Ključne reči: bolest šaka, stopala i usta, ospa, enterovirus, epidemija, predškolski uzrast

Uvod

Bolest šaka, stopala i usta (engl. *Hand, Foot and Mouth Disease* - HFMD) je zarazna bolest koja se najčešće javlja kod dece mlađe od 10 godina, a ređe kod odraslih (1). Manifestuje se povišenom telesnom temperaturom, vezikularnim osipom na šakama, stopalima i gluteusu, kao i vezikuloznim promenama na oralnoj sluzokoži koje podsećaju na herpanginu. Kod većine dece bolest se ispoljava u blagoj formi, ali kod malog procenta može doći do ozbiljnih komplikacija, u vidu meningitisa, encefalitisa, akutne flakcidne paralize i neurorespiratornog sindroma. Period inkubacije je kratak i iznosi 3-6 dana.

Prouzrokovač bolesti je virus iz grupe enterovirusa. Koksaki A16 i enterovirus 71 predstavljaju najčešće uzročnike bolesti šaka, stopala i usta. Infekcija se prenosi direktnim kontaktom sa zaraženom osobom putem: pljuvačke, fecesa, sadržaja kožnih promena, respiratornih kapljica i indirektno preko kontaminiranih predmeta. Virus se može izolovati iz ždrela i stolice nekoliko dana pre pojave simptoma i perzistirati nedeljama nakon kliničkog ozdravljenja (do 2 nedelje u ždrelu, a u stolici i do 11 nedelja) (1-3).

Dijagnoza se najčešće postavlja na osnovu kliničke slike i detekcijom virusa *Real-Time* PCR metodom. Većina obolelih se oporavi u toku nekoliko nedelja bez rezidualnih sekvela, pri čemu akutna faza oboljenja obično traje 10 do 14 dana. Terapija je simptomatska (4,5).

Epidemije HFMD javljaju se u kolektivima (vrtićima, školama, kampovima), zdravstvenim ustanovama i u porodicama (4,6-8). Ovo oboljenje prvi put je prijavljeno 1957. godine u Kanadi i od

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EPIDEMIOLOGICAL CHARACTERISTICS OF OUTBREAKS OF HAND, FOOT AND MOUTH DISEASE IN KINDERGARTENS IN BELGRADE DURING THE PERIOD FROM 2015 TO 2019

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SUMMARY

Introduction/Aim: For the first time in the world Hand, Foot and Mouth Disease was reported in 1957 in Canada, while the first outbreak of this disease was registered in Belgrade in 2014.The aim of this paper is to analyze epidemiological characteristics of outbreaks of HFMD, which occurred in kindergartens in Belgrade in the period from 2015 to 2019.
Methods: A descriptive epidemiological study was applied. Data were collected from epidemiological questionnaires, Reports of Center for Disease Control and Prevention, City Institute of Public Health Belgrade, from the case history of sick children, and using the results of the virological and serological analyses that had been done in the Reference Laboratory of the Institute of Virology, Vaccines, and Sera "Torlak".
Results: In the period from 2015 to 2019, 20 HFMD outbreaks were registered, in which a total of 220 children became ill. The total number of infected children in outbreaks ranged from 9 to 102. Boys were slightly more often ill (52%), as well as persons aged two years (51%). All patients had a maculopapular rash, and most had a fever (96%) and malaise (68%). Enterovirus was detected by Real-Time PCR in two infected children. The disease passed without any complications.
Conclusion: By timely application of anti-epidemic measures, by reporting the disease, isolation and treatment of patients, respecting the measures of general and personal hygiene, as well as measures of current disinfection in the collective, it is possible to successfully stop further spread of the infection.

Key words: hand, foot and mouth disease, maculopapular rash, enterovirus, outbreak, preschool age

Introduction

Hand, Foot and Mouth Disease (HFMD) is a contagious disease that mainly affects children younger than 10, and more rarely adults (1). The main manifestations are fever, vesicular rashes on hands, feet and buttocks, and ulcers in the oral mucosa that remind of herpangina. Manifestations are usually mild, but a small proportion of children may experience severe complications, such as meningitis, encephalitis, acute flaccid paralysis and a neurorespiratory syndrome. The incubation period is short, usually 3-6 days.

The cause of the disease is a virus from the group of enteroviruses. Coxsackie virus A16 and enterovirus 71 are the most common causes of hand, foot and mouth disease. The infection is transmitted by direct contact with an infected person: saliva, feces, fluids of skin changes, respiratory droplets, and indirectly via contaminated things. The virus can be isolated from pharynx or feces a few days before the appearance of symptoms and it can persist weeks after clinical recovery (to 2 weeks in the pharynx and 11 weeks in feces) (1-3).

The diagnosis is most frequently established on the basis of clinical picture and the virus is detected with the help of Real-Time PCR method. The majority of people with the disease recover within several weeks without residual sequelae, while the acute phase of the disease usually lasts 10 to 14 days. The therapy is symptomatic (4,5).

tada se registruje širom sveta. Na teritoriji Beograda prva epidemija bolesti šaka, stopala i usta registrovana je 2014. godine (9,10).

Cilj ovoga rada je da se analiziraju epidemiološke karakteristike epidemija HFMD koje su se javile u vrtićima u Beogradu tokom perioda od 2015. do 2019. godine.

Metode

Primenjena je deskriptivna epidemiološka studija. Za analizu epidemijskog javljanja HFMD korišćeni su podaci iz epidemioloških upitnika i informacije Centra za kontrolu i prevenciju bolesti Gradskog zavoda za javno zdravlje Beograd, medicinska dokumentacija i rezultati virusoloških analiza obavljenih u Referentnoj laboratoriji Instituta za virusologiju, vakcine i serume „Torlak". Statistička obrada podataka urađena je primenom SPSS programa (IBM SPSS Statistics 22).

Rezultati

U periodu od 2015. do 2019. godine registrovano je 20 epidemija HFMD u kojima je ukupno obolelo 220 dece iz 15 beogradskih vrtića. Najveći broj obolele dece registrovan je u opštini Novi Beograd 140 (64%), Obrenovac 39 (18%) i Voždovac 18 (8%), a najniži u opštinama Čukarica 12 (5%) i Palilula 11 (5%). U ostalim opštinama Beograda nije registrovano obolevanje.

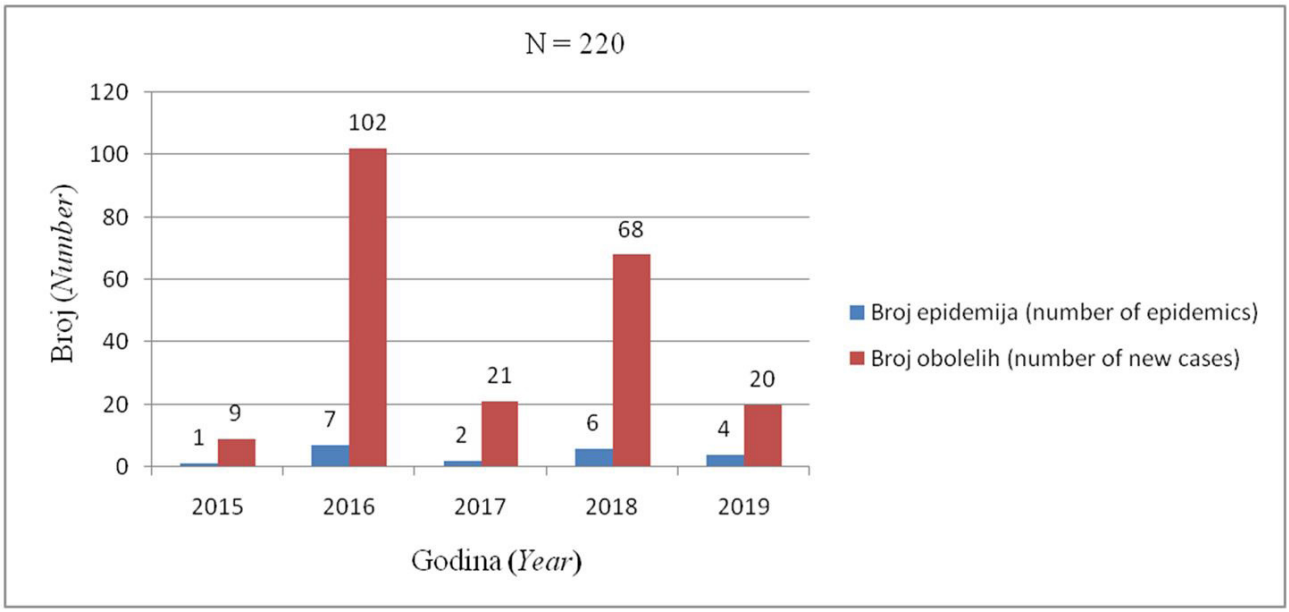
U posmatranom periodu godišnji broj epidemija se kretao od jedan do 7, a broj obolelih od 9 do 102 (Grafikon 1). Najveći broj prijavljenih epidemija, i to sedam, zabeležen je tokom 2016. godine. U istoj godini bilo je 102 obolelih, što predstavlja najveći ukupan broj obolelih u jednoj godini. Najmanji broj epidemija (i to samo jedna), kao i najmanji broj obolelih u epidemijama (samo devet obolelih), registrovani su 2015. godine. Enterovirus je detektovan *Real-Time* PCR metodom kod dva obolela deteta (2015. i 2016. godine).

Tokom posmatranog petogodišnjeg perioda, najveći broj obolelih od HFMD je bio u drugoj godini života (51%), a najmanje u šestoj (1%) (Tabela 1). Dečaci (52%) su nešto češće obolevali od HFMD nego devojčice (48%). Među obolelima ne postoji statistički značajna razlika u godinama starosti između dečaka i devojčica (χ^2=2,633, df=5, p=0,756, p > 0,05).

Najveći broj obolele dece registrovan je trećeg dana (19%), četvrtog (18%) i drugog dana (16%) od pojave prvog slučaja oboljenja u kolektivu, što odgovara inkubaciji HMFD, koja iznosi 3 – 6 dana (Tabela 2).

Kod svih obolelih klinička slika se karakterisala pojavom makulopapuloznih kožnih promena na predilekcionim mestima, a kod 96% dece došlo je do pojave povišene temperature i kod 68% malaksalosti (Grafikon 2).

Ospa je bila prisutna kod najvećeg broja dece na stopalima (29%), a zatim oko usta 26% i na šakama (26%) (Grafikon 3). Ređe se javljala na leđima, u glutealnoj i genitalnoj regiji.



Grafikon 1. Broj epidemija i novoobolelih od bolesti šaka, stopala i usta, Beograd, 2015 – 2019. godine

Outbreaks of HFMD appear in the collectives (kindergartens, schools, camps), health care institutions and families (4,6-8). This disease was reported for the first time in Canada in 1957 and since then it has been registered around the world. The first outbreak of hand, foot and mouth disease was registered in the territory of Belgrade in 2014 (9,10).

The aim of this work was to analyze the epidemiological characteristics of outbreaks of HFMD that appeared in kindergartens in Belgrade during the period 2015-2019.

Methods

A descriptive epidemiological study was applied. Data from the epidemiological questionnaires and information from the Center for Disease Control and Prevention of the City Institute of Public Health Belgrade, medical history, and the results of virological analyses that had been done in the Reference Laboratory of the Institute of Virology, Vaccines and Sera "Torlak" were used for the analysis of epidemics of HFMD. The statistical analysis of data was done with the help of SPSS package (IBM SPSS Statistics 22).

Results

During the period 2015-2019, 20 outbreaks of HFMD were registered when 220 children from kindergartens in Belgrade got the disease. The largest number of children with the disease was registered in the municipality of Novi Beograd 140 (64%), Obrenovac 39 (18%) and Vozdovac 18 (8%), while the lowest number was in the municipality of Cukarica 12 (5%) and Palilula 11 (5%). The disease was not registered in other municipalities.

During the observed period, the annual number of epidemics ranged from 1 to 7, while the number of ill people ranged from 9 to 102 (Figure 1). The largest number of epidemics that were reported was registered in 2016, that is, 7 epidemics. During the same year, there were 102 ill people, which was the largest total number of ill people during one year. The smallest number of epidemics (only one), and the lowest number of ill persons in an epidemic (only 9 ill persons) was registered in 2015. Enterovirus was detected by the Real-Time PCR method in two ill children (2015 and 2016).

During the observed five-year-period, the largest number of children with HFMD was in their second year (51%), while the smallest number was in their sixth year (1%) (Table 1). Boys (52%) were affected by HFMD more frequently than girls (48%). There was no statistically significant difference regarding age between boys and girls (χ^2=2.633, df=5, p=0.756, p<0.05).

The greatest number of ill children was registered on the third day (19%), the fourth (18%) and the second day (16%) from the appearance of

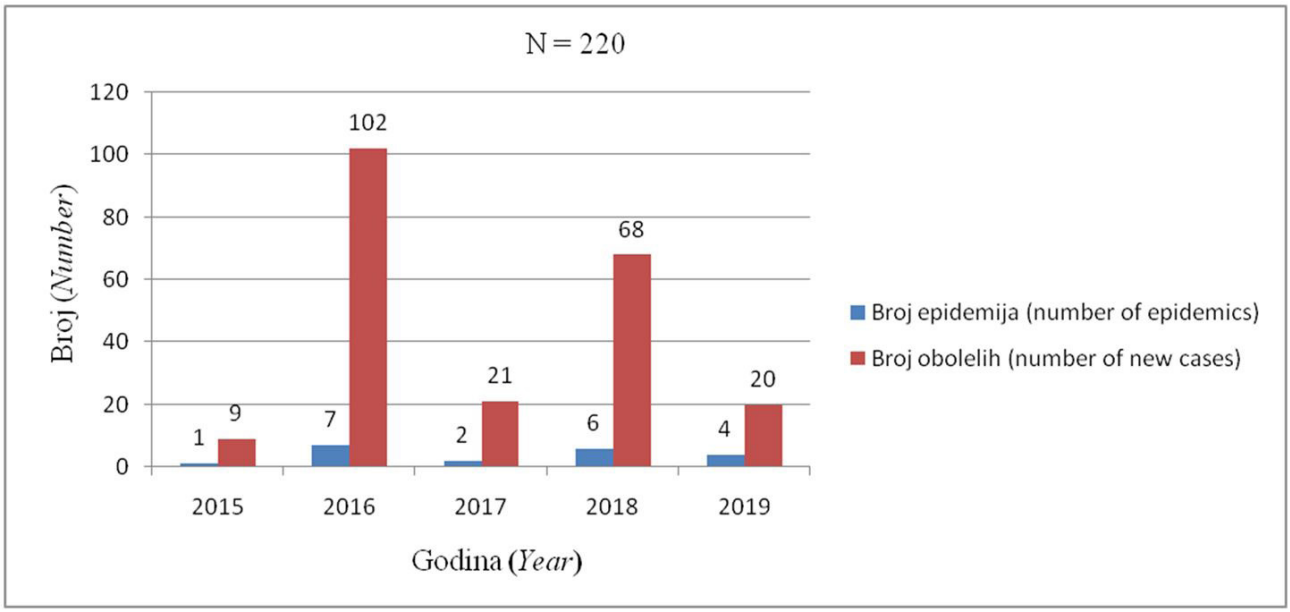


Figure 1. Number of epidemics and new cases of hand, foot and mouth disease, Belgrade, 2015 – 2019

Tabela 1. Distribucija novoobolelih od bolesti šaka, stopala i usta po polu i uzrastu, Beograd, 2015 – 2019. godine

Uzrast (godine)	Dečaci Broj (%) N=114	Devojčice Broj (%) N=106	Ukupno Broj (%) N=220
1	15 (13,2)	16 (15,1)	31 (14,8)
2	58 (50,9)	56 (52,8)	114 (51,8)
3	28 (24,6)	23 (21,7)	51 (23,2)
4	7 (6,1)	6 (5,7)	13 (5,9)
5	5 (4,4)	2 (1,9)	7 (3,2)
6	1 (0,9)	3 (2,8)	4 (1,8)

Sezonska distribucija ukazuje da je najveći broj obolelih registrovan u maju - 89 i junu– 40, a najniži u avgustu - 5 i decembru- 6, dok u januaru, februaru i aprilu mesecu nije bilo obolelih (Grafikon 4).

Diskusija

U našoj studiji, u periodu od 2015. do 2019. godine registrovano je 20 epidemija HFMD u 15 beogradskih vrtića, pri čemu je najveći broj obolele dece (102) bio u 2016. godini, a najmanji (samo devetoro dece) u 2015. godini. Najveći broj obolelih je bio u drugoj godini (51%), a najmanji u šestoj godini (1%). U epidemiji bolesti šaka, stopala i usta u 4 države Sjedinjenih Američkih Država (SAD), u periodu od 07.11.2011. do 29.02.2012. godine, obolele su 63 osobe. Epidemiološkim istraživanjem utvrđeno je da su od 63 pacijenta 40 (74%) bili mlađi od 2 godine, a 15 (24%) su bili odrasli uzrasta 18 i više godina. U predškolskim i školskim ustanovama su se zarazila 44 (70%) obolela deteta, dok se 8 (53%) od 15 odraslih inficiralo pri kontaktu sa obolelom decom (pružanje zdravstvene nege, kućni kontakt) (12). Dečaci su među obolelima bili zastupljeniji sa 52% u odnosu na devojčice. Rezultati studije sprovedene u bolnici na jugu Španije, ukazuje da su devojčice bile zastupljenije među obolelima (64%), suprotno našim rezultatima (13). U našem ranijem istraživanju sprovedenom 2016. godine, bilo je nešto više obolelih dečaka i to najviše uzrasta tri godine (14).

Tabela 2. Distribucija obolevanja po danima u odnosu na pojavu prvog slučaja oboljenja u vrtiću, Beograd, 2015 – 2019. godine

Dan od pojave prvog slučaja obolelog od bolesti šaka, stopala i ruku u kolektivu	Dečaci Broj (%) N=114	Devojčice Broj (%) N=106	Ukupno Broj (%) N=220
1	13 (11,4)	16 (15,1)	29 (13,2)
2	22 (19,3)	14 (13,2)	36 (16,4)
3	25 (21,9)	17 (16,0)	42 (19,1)
4	22 (19,3)	17 (16,0)	39 (17,7)
5	14 (12,3)	9 (8,5)	23 (10,4)
6	4 (3,5)	18 (17,0)	22 (10,0)
7	7 (6,1)	7 (6,6)	14 (6,4)
8	2 (1,8)	5 (4,7)	7 (3,2)
9	4 (3,5)	1 (0,9)	5 (2,3)
10	1 (0,9)	2 (1,9)	3 (1,4)

Table 1. Distribution of new cases of hand, foot and mouth disease by gender and age, Belgrade, 2015 –2019

Age (years)	Boys Number (%) N=114	Girls Number (%) N=106	Total Number (%) N=220
1	15 (13.2)	16 (15.1)	31 (14.8)
2	58 (50.9)	56 (52.8)	114 (51.8)
3	28 (24.6)	23 (21.7)	51 (23.2)
4	7 (6.1)	6 (5.7)	13 (5.9)
5	5 (4.4)	2 (1.9)	7 (3.2)
6	1 (0.9)	3 (2.8)	4 (1.8)

the first case in the collective, which responds to the incubation period for HFMD that amounts to 3-6 days (Table 2).

The clinical picture of all patients was characterized by the maculopapular rash on the predilection sites, while 96% of children had fever and 68% malaise (Figure 2).

The majority of children had rash on their feet (29%), then around their mouth (26%) and on hands (26%) (Figure 3). It appeared more rarely on the back, in the gluteal and genital region.

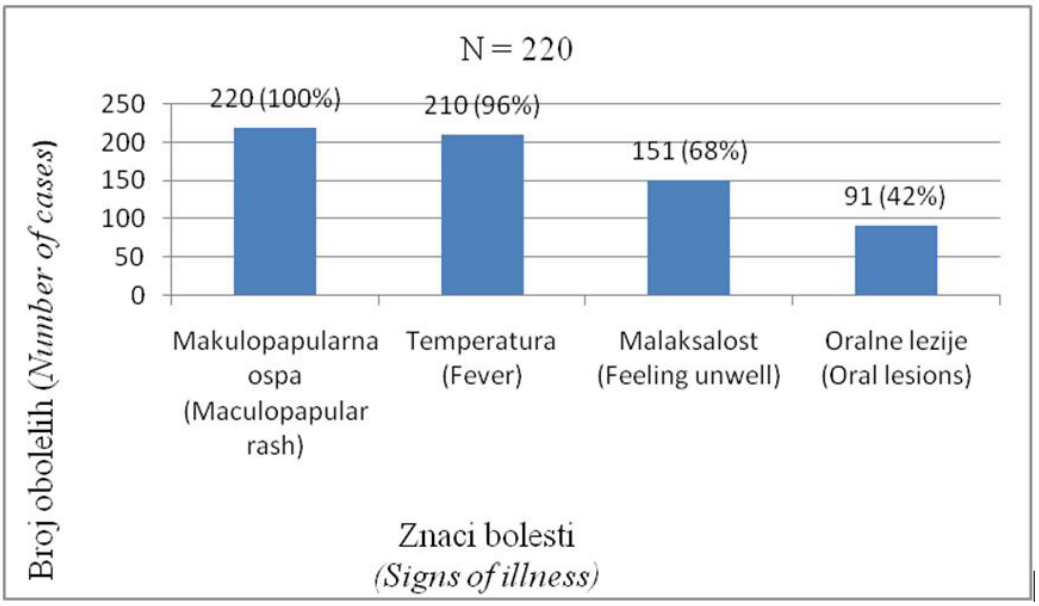
Seasonal distribution suggested that the largest number of ill children was registered in May (89) and June (40), while the lowest number was registered in August (5) and December (6) and there were no ill children in January, February and April (Figure 4).

Discussion

In our study, during the period 2015-2019, 20 epidemics of HFMD were registered in 15 Belgrade kindergartens, while the largest number of ill children was in 2016 (102), and the lowest was in 2015 (only 9 children). The majority of patients were 2 years old (51%), while only 1% of patients were six years old. In the epidemics of hand, foot and mouth disease in four states of the United Stated of America, during the period November 7th, 2011 to February 29th, 2012, there were 63 ill persons. It was established in the epidemiological investigation that of the 63 patients, 40 (74%) were younger than 2, while 15 of them (24%) were adults aged 18 and older. In the pre-school institutions and schools, there were 44 (70%) ill

Table 2. Distribution of disease by days in relation to the occurrence of the first case of the disease in kindergartens, Belgrade, 2015 –2019

The day since the appearance of the first case of the disease of hands, feet and hands in the team	Boys Number (%) N=114	Girls Number (%) N=106	Total Number (%) N=220
1	13 (11.4)	16 (15.1)	29 (13.2)
2	22 (19.3)	14 (13.2)	36 (16.4)
3	25 (21.9)	17 (16.0)	42 (19.1)
4	22 (19.3)	17 (16.0)	39 (17.7)
5	14 (12.3)	9 (8.5)	23 (10.4)
6	4 (3.5)	18 (17.0)	22 (10.0)
7	7 (6.1)	7 (6.6)	14 (6.4)
8	2 (1.8)	5 (4.7)	7 (3.2)
9	4 (3.5)	1 (0.9)	5 (2.3)
10	1 (0.9)	2 (1.9)	3 (1.4)

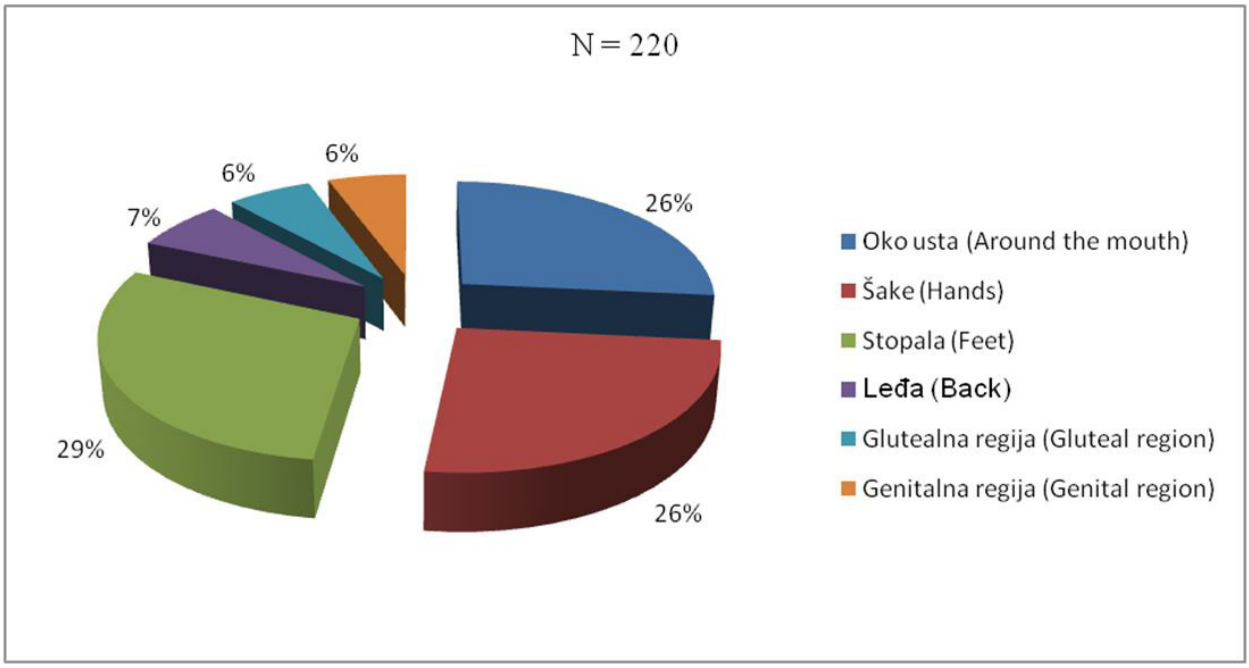


Grafikon 2. Zastupljenost simptoma i znakova bolesti šaka, stopala i usta među obolelima, Beograd, 2015 – 2019. godine

U našem istraživanju, u kliničkoj slici dominirala je pojava ospe (100%), povišena temperatura (96%) i malaksalost 68%, a ređe su bile prisutne oralne lezije (42%). Suprotno našim rezultatima, u epidemiji bolesti šaka, stopala i usta u četiri države SAD, u periodu od 07.11.2011. do 29.02.2012. godine, kliničku sliku je karakterisala povišena temperatura (76%), ospa na šakama, stopalima ili ustima (67%), na rukama ili nogama (46%), licu (41%), glutelnoj regiji (35%) i na trupu (19%) (12). Klinički uzorci su prikupljeni za 34 pacijenta. Enterovirus je detektovan *Real-Time* PCR metodom kod 25 (74%) obolelih.

U svim beogradskim vrtićima u posmatranom periodu svi oboleli od HFMD javili su se unutar 10 dana od pojave prvog slučaja bolesti, što ukazuje na uspešno sprovedene protivepidemijske mere (11). Enterovirus je detektovan *Real-Time* PCR metodom samo kod dva obolela deteta.

U poređenju sa našim epidemijama koje su protekle bez komplikacija, studija koja je pratila decu obolelu od HFMD primljenu u bolnici na jugu



Grafikon 3. Procentualna zastupljenost ospe prema lokalizaciji, Beograd, 2015– 2019. godine

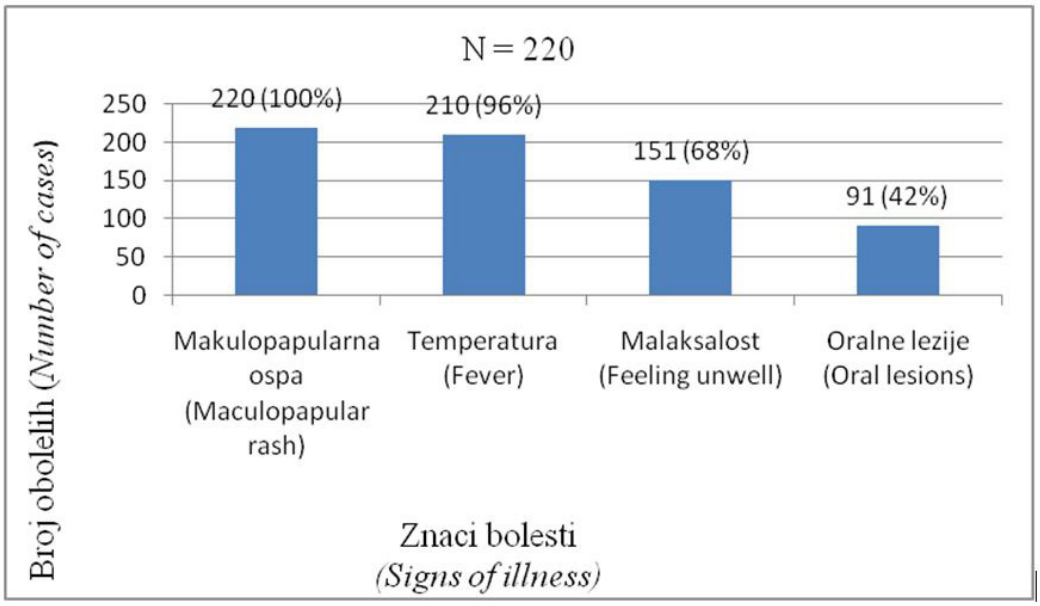


Figure 2. Signs and symptoms of hand, foot and mouth disease by percentage among the sick children, Belgrade, 2015 –2019

children, while 8 (53%) of 15 adults contracted the disease through contact with the infected children (contact with children in child care, contact at home) (12). There were slightly more boys (52%) than girls among the infected. The results of one study conducted in the hospital in the south of Spain suggested that there were more girls (64%) among patients, contrary to our results (13). In a previous research conducted in 2016, there were slightly more boys who were three years old (14).

In our study, rash (100%), fever (96%) and malaise (68%) were dominant in the clinical picture, while oral lesions (42%) were less frequent. Contrary to our results, in an outbreak of hand, foot and mouth disease in the four states of the USA, from November 7th, 2011 to February 29th, 2012, the clinical picture was characterized by fever (76%), rash on the hands, feet or in the mouth (67%), on the arms or legs (46%), face (41%), buttocks (35%), and trunk (19%) (12). Clinical specimens were collected for 34 patients. Enterovirus was detected by the Real-Time PCR method in 25 (74%) of patients.

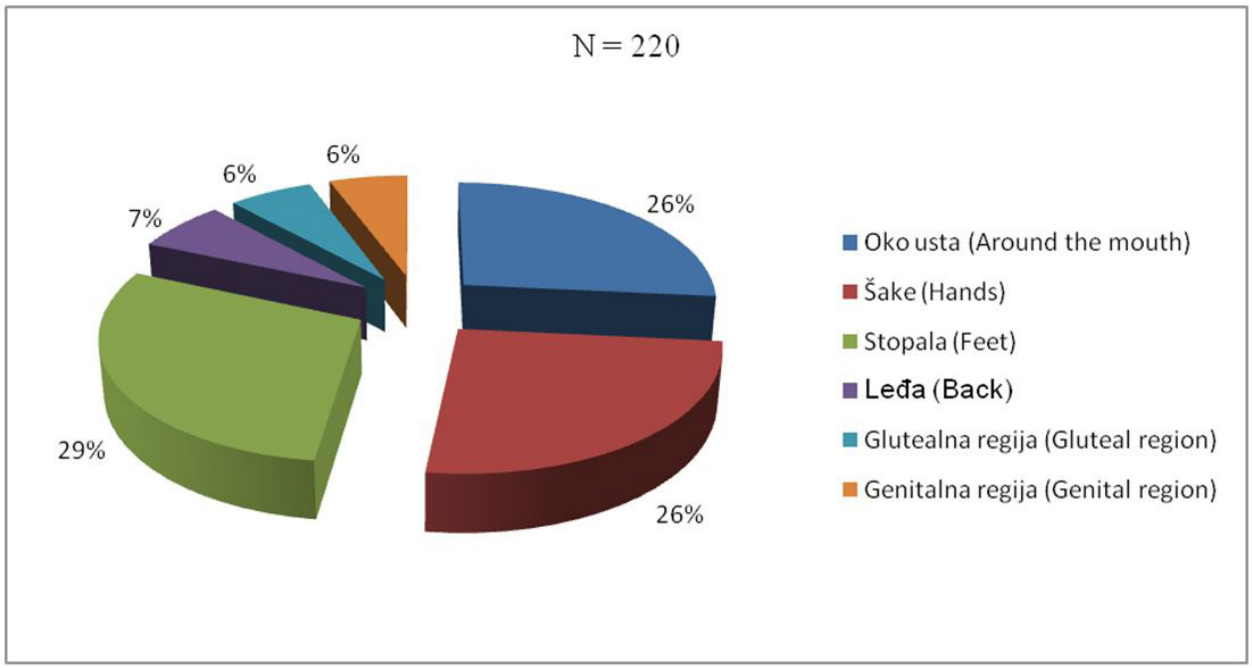
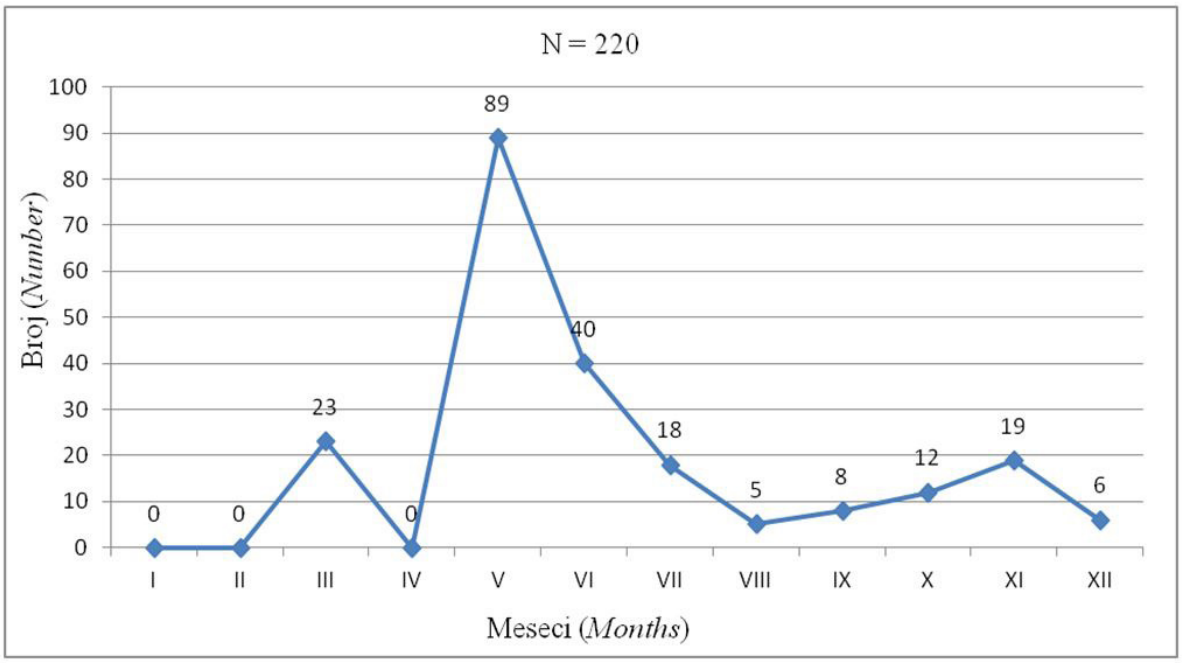


Figure 3. Skin Percentage of skin rash according to localization, Belgrade preschools, 2015 – 2019



Grafikon 4. Distribucija novoobolelih od bolesti šaka, stopala i usta po mesecima, Beograd, 2015 – 2019. godine

Kine, u periodu 2013 – 2017. godine, pokazala je da su se komplikacije javile kod 35,6% obolelih, a do smrtnog ishoda je došlo kod 56 (0,8%) pacijenata (15).

Sezonske varijacije obolelih u našoj studiji ukazuju da je najveći broj obolelih - 89 registrovan u maju mesecu (kasno proleće). Epidemiološka istraživanja HFMD epidemija sprovedena u Narodnoj Republici Kini septembra meseca 2012. godine, u naselju Shavo, istočne provincije Henan, i novembra meseca 2015. godine u vrtiću grada Pekinga, ukazuju da je najveći broj epidemija registrovan u jesenjim mesecima (16,17).

Zaključak

Od 2015. do 2019. godine u beogradskim vrtićima u epidemijama HFMD obolelo je 220 dece. Među obolelom decom bilo je najviše dece uzrasta dve godine, kao i nešto više dečaka nego devojčica. Klinička slika kod svih je bila u vidu ospe, a kod 96% dece u vidu povišene temperature i kod 68% u vidu malaksalosti. Oralne lezije zabeležene su kod 42% obolelih.

Oboljenje je uglavnom proticalo sa blagom kliničkom slikom, bez komplikacija, sa potpunim oporavkom. Pravovremenom primenom protivepidemijskih mera: prijavom oboljenja, izolacijom i lečenjem obolelih, poštovanjem mera opšte i lične higijene, kao i mera tekuće dezinfekcije u kolektivu, uspešno se zaustavlja dalje širenje infekcije.

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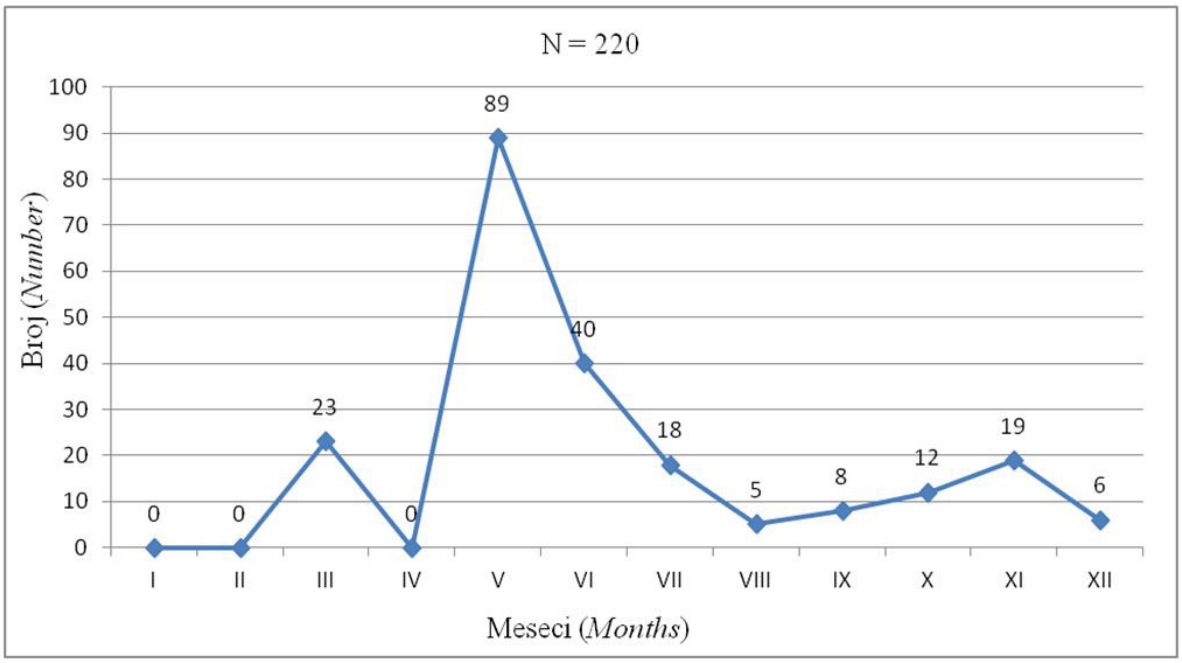

Figure 4. Distribution of new cases of hand, foot and mouth disease by months, Belgrade, 2015 – 2019

In all Belgrade kindergartens during the observed period, all patients with HFMD visited their doctors within 10 days from the appearance of the first case of disease, which pointed to the successful prevention measures (11). Enterovirus was detected by the Real-Time PCR method only in two children.

In comparison to our epidemics that passed without complications, a study that observed children with HFMD at one hospital in the south of China, during the period 2013-2017, showed that complications appeared in 35.6% of ill persons, whereas there came to the deathly outcome in 56 (0.8%) patients (15).

Seasonal variations among ill patients in our study suggested that the largest number of patients (89) was registered in May (late spring). Epidemiological investigation of HFMD epidemics conducted in the People's Republic of China in September 2012, in the town Shawo in eastern Henan province, and in November 2015, in one kindergarten in the city of Beijing, indicated that the largest number of epidemics was registered in autumn months (16,17).

Conclusion

From 2015 to 2019, there were 220 children with HFMD in Belgrade kindergartens. The majority of children were aged 2, and there were slightly more boys than girls. Rash was present in the clinical picture of all of them, while 96% had fever and 68% had malaise. Oral lesions were registered in 42% of patients.

The disease usually passed with a mild clinical picture, without complications and with the complete recovery. Further spreading of the infection may be successfully stopped by the timely application of prevention measures, that is, the notification of disease, isolation and treatment of persons with the disease, by respecting the measures of general and personal hygiene, as well as the measures of current disinfection in the collective.

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RAZLIKE U DEMOGRAFSKIM KARAKTERISTIKAMA, RIZIČNOM PONAŠANJU I HIV STATUSU MUŠKARACA I ŽENA KOJI SU SE DOBROVOLJNO POVERLJIVO SAVETOVALI I TESTIRALI U SAVETOVALIŠTU ZA HIV/AIDS GRADSKOG ZAVODA ZA JAVNO ZDRAVLJE BEOGRAD

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SAŽETAK

Uvod/Cilj: Dobrovoljno poverljivo savetovanje i testiranje (DPST) na HIV/AIDS podrazumeva da klijenti savetovališta dobijaju informacije o HIV/AIDS-u, načinima transmisije, kako da u svom ponašanju prepoznaju, smanje ili izbegnu rizike za HIV infekciju, o sigurnom seksualnom odnosu, mestu gde se mogu testirati, kako dalje da postupaju u zavisnosti od rezultata testa, da bi zaštitili sebe i druge osobe. Cilj ovog istraživanja je bio da se ispita da li postoje razlike u demografskim karakteristikama, rizičnom ponašanju i HIV statusu između muškaraca i žena koji su se dobrovoljno poverljivo savetovali i testirali u Savetovalištu za HIV/AIDS Gradskog zavoda za javno zdravlje (GZJZ) Beograd.
Metode: Istraživanje je sprovedeno po tipu studije preseka u koju je uključeno 3.480 osoba (43,2% žena i 56,8% muškaraca) koje su se, u periodu od 2017. do 2019. godine, DPST na HIV/AIDS u Savetovalištu za HIV/AIDS GZJZ Beograd. Za statističku analizu podataka korišćeni su χ^2 ili Fišerov test.
Rezultati: Najveći deo žena (42,1%) i muškaraca (42,5%) koji su se DPST činile su osobe uzrasta 21-30 godina. Muškarci su značajno češće koristili usluge DPST nego žene. HIV pozitivan status je bio značajno češće otkriven kod muškaraca (2,5%) nego žena (0,3%). Žene su se značajno češće javljale na DPST usled moguće izloženosti HIV infekciji putem heteroseksualnog kontakta (84,9%), akcidentalno (11,1%) i silovanjem (1,0%), a muškarci usled heteroseksualnog kontakta (59,3%), homoseksualnog i biseksualnog kontakta (33,6%) i intravenoznog korišćenja droge (1,1%). Muškarci su značajno češće koristili kondome uvek ili često (40,1%) i imali dva ili više partnera (53,2%) tokom poslednjih 12 meseci nego žene (24,2% i 20,6%).
Zaključak: DPST je neophodno u borbi protiv HIV infekcije, posebno sa aspekta ranog otkrivanja osoba sa ovom infekcijom i edukacije HIV negativnih osoba o rizičnom seksualnom ponašanju i mogućim merama prevencije.

Ključne reči: dobrovoljno poverljivo savetovanje i testiranje, HIV/AIDS, faktori rizika

Uvod

HIV (engl. *Human Immunodeficiency Virus*) dovodi do nastanka AIDS-a (engl. *Acquired Immune Deficiency Syndrome*). AIDS predstavlja globalni problem, a cilj je da se zaustavi porast broja novoinficiranih HIV-om, kao i da se omogući svakoj osobi sa HIV-om da zna svoj status i da ima pristup odgovarajućoj antiretrovirusnoj (ARV) terapiji (1).

Prema podacima programa Ujedinjenih nacija za HIV/AIDS (engl. *United Nations Programme on HIV/AIDS* - UNAIDS), u svetu, 2019. godine, živelo je 38,0 miliona ljudi sa HIV-om, od kojih je 36,2 miliona odraslih i 1,8 miliona dece uzrasta od 0 do 14 godina (1,2). Iste ove godine broj novoinficiranih HIV-om je iznosio 1,7 miliona (odnosno 1,5 miliona odraslih i 150.000 dece mlađe od 15 godina), a broj umrlih oko 690.000 (3). Procenjeno je da je broj novoinficiranih za 23% manji nego što je bio 2010. godine. Ono što najviše zabrinjava je činjenica da 7,1 milion ljudi nije znalo da živi sa HIV-om, kao i da je samo 25,4 miliona ljudi bilo na ARV terapiji, odnosno da 12,6 miliona ljudi još uvek čeka terapiju. Jasno je da pravovremena terapija doprinosi da se globalna pandemija AIDS-a okonča, kao i da se unapredi kvalitet života osoba sa HIV-om

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DIFFERENCES IN DEMOGRAPHIC CHARACTERISTICS, RISKY BEHAVIOR AND HIV STATUS OF MEN AND WOMEN WHO WERE VOLUNTARILY AND CONFIDENTIALLY COUNSELED AND TESTED AT THE COUNSELING CENTER FOR HIV/AIDS OF THE INSTITUTE OF PUBLIC HEALTH IN BELGRADE

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SUMMARY

Introduction/Aim: Voluntary and confidential counseling and testing (VCCT) means getting information about HIV, ways of transmission, recognizing, reducing or avoiding risks for HIV infection, about safe sexual relations, the place where people can be tested, and what they should do depending on the test results in order to protect themselves and other people. The aim of this study was to examine differences in demographic characteristics, risky behavior and HIV status between men and women who were voluntarily and confidentially counseled and tested at the Counseling Center for HIV/AIDS of the Institute of Public Health in Belgrade.
Methods: This research was conducted as a cross-sectional study and it included 3,480 persons (43.2% of women and 56.8% of men), who were counseled and tested at the Counseling Center for HIV/AIDS of the Institute of Public Health in Belgrade from 2017 to 2019. χ^2 or Fisher's test was used for the statistical analysis of data.
Results: The majority of women (42.1%) and men (42.5%) who were counseled and tested were in the age group 21-30 years. Men used DPST services significantly more often than women. HIV positive status was significantly more frequent in men (2.5%) than in women (0.3%). Women came significantly more often to voluntary counseling and testing due to the possible exposure to HIV infection by heterosexual contact (84.9%), accident (11.1%) and raping (1.0%), while men were counseled and tested due to heterosexual contact (59.3%), homosexual and bisexual contact (33.6%) and intravenous drug abuse (1.1%). Men used condoms always or often (40.1%) and had two or more partners (53.2%) more frequently during the last 12 months in comparison to women (24.2% and 20.6%).
Conclusion: Voluntary and confidential counseling and testing is necessary in the fight against HIV infection, especially from the perspective of early discovering of people with this infection and education of HIV negative persons about risky sexual behavior and possible prevention measures.

Key words: voluntary, confidential counseling and testing, HIV/AIDS, risk factors

Introduction

Human Immunodeficiency Virus (HIV) leads to the appearance of AIDS (Acquired Immune Deficiency Syndrome). AIDS represents a global problem, while the aim is to stop the increase in the number of newly infected with HIV, as well as to enable each person with HIV to know their status and to have access to antiretroviral therapy (ART) (1).

According to the data of the United Nations for AIDS (UNAIDS), in 2019 there were 38.0 million people living with HIV in the world, while 36.2 million were adults and 1.8 million were children aged 0 to 14 years (1,2). In the same year, the number of newly infected with HIV amounted to 1.7 million (that is 1.5 million of adults and 150.000 of children younger than 15), while the number of deaths was around 690.000 (3). It was estimated that the number of newly infected was for 23% lower than in 2010. The most worrying fact is that 7.1 million people did not know that they lived with HIV, and that only 25.4 million people received the antiretroviral therapy, that is,

i onemogući da seksualnim putem prenesu HIV svojim HIV-negativnim partnerima (3).

Iako smo, kao društvo, napredovali u saznanjima o virusu, kao i kako se od njega zaštiti, i dalje postoji veliki broj ljudi koji diskriminišu osobe koje su HIV pozitivne. Čak u 25 zemalja sveta više od 50% odraslih osoba ima diskriminišuće stavove o osobama koje su HIV pozitivne (3).

U Republici Srbiji, prema podacima Instituta za javno zdravlje Srbije „dr Milan Jovanović Batut", od 1985. do novembra 2019. godine, registrovano je 4.027 osoba inficiranih HIV-om (4). Od ukupnog broja inficiranih HIV-om, 2.022 osobe su obolele od AIDS-a, a od tog broja 1.150 osoba je umrlo od AIDS-a. Prema statističkim podacima još 121 osoba inficirana HIV-om je umrla od bolesti ili stanja koja nisu povezana sa HIV infekcijom. Tokom svih godina od početka pojave HIV infekcije u Srbiji, dominantan put prenosa je seksualni (89% svih slučajeva registrovanih tokom 2019. godine), a potom prednjači nezaštićeni analni seкsualni odnos među muškarcima, kako među novootkrivenim osobama inficiranim HIV-om (77%), tako i među obolelima (56%) i umrlima od AIDS-a (44%). Od januara do novembra 2019. godine, registovano je 175 osoba novoinficiranih HIV-om (156 muškaraca i 19 žena). Najveći broj novoinficiranih HIV-om je u Beogradu, čak 75. Što se tiče načina transmisije, 156 osoba je HIV dobilo seksualnim putem tokom nezaštićenog odnosa (97,5% svih slučajeva sa poznatim načinom transmisije). U periodu od 2017. do 2019. godine dolazi do daljeg porasta novoinficiranih HIV-om, kao i novodijagnostikovanih od AIDS-a. Porast broja novoinficiranih HIV-om i novodijagnostikovanih obolelih od AIDS-a je posledica informisanja i promocije značaja besplatnog DPST na HIV/AIDS. Takođe, ove usluge (savetovanje, informisanje i testiranje) su dostupnije i prisutnije u različitim zdravstvenim ustanovama, ali i van zdravstvenih ustanova, posebno za osobe sa rizičnim ponašanjem iz ključnih populacija pod povećanim rizikom od HIV-a (5).

Testiranje na HIV može da bude inicirano od strane korisnika ili može da bude preporučeno od strane pružaoca usluga (npr. dijagnostičko HIV testiranje, indikovano testiranje usled pojave simptoma koji se mogu povezati sa HIV-om). Takođe, postoji rutinsko (npr. obavezno testiranje koje je regulisano zakonom u službama za transfuziju krvi za svaku uzetu jedinicu krvi) i mandatorno testiranje po tzv. „*opt in*" ili „*opt out*" modelu (npr. testiranje trudnica, pacijenata na hemodijalizi, pacijenata koji se leče na klinikama za tuberkulozu ili za venerične bolesti) (6).

U okviru ovog rada akcenat je stavljen na DPST na HIV/AIDS, koje treba da se bazira na principima dobrovoljnosti, poverljivosti i anonimnosti. Ono ima ključnu ulogu u prevenciji HIV-a. Nacionalni Vodič dobre prakse za DPST i Protokol rada koji je detaljno definisao celu proceduru DPST-a, koji se oslanja na zajedničke protokole Ujedinjenih nacija za HIV/AIDS (engl. *Joint United Nations program on AIDS/HIV* - UNAIDS) i Svetske zdravstvene organizacije (SZO) umnogome su uticali na dobar kvalitet rada.

U Republici Srbiji razvoj DPST na HIV/AIDS vezuje se za Centar za DPST u Zavodu za zdravstvenu zaštitu studenata (ZZZS) Beograd. Savetnici iz DPST Centra u ZZZS su u radu sa Ujedinjenim nacijama i drugim organizacijama civilnog društva razvili model rada koji se od 2002. godine uspešno primenjuje u vladinom i nevladinom sektoru. DPTS podrazumeva dobijanje informacija o HIV-u, načinima transmisije, kako osobe da prepoznaju, smanje ili izbegnu rizike za HIV infekciju u svom ponašanju, o siguranom seksualnom odnosu, mestu gde se mogu testirati i u zavisnosti od rezultata HIV testa, kako dalje da postupaju, da bi zaštili sebe i druge osobe. DPST pomaže sa svojim širim pristupom u smanjenju diskriminacije osoba koje žive sa HIV-om sa ciljem njene eliminacije (7).

Cilj ove studije preseka je bio da se ispita da li postoje razlike u demografskim karakteristikama, rizičnom ponašanju i HIV statusu između muškaraca i žena koji su se DPST u Savetovalištu za HIV/AIDS Gradskog zavoda za javno zdravlje (GZJZ) Beograd u periodu od 2017. do 2019. godine.

Metode

Istraživanje je sprovedeno po tipu studije preseka u koju je uključeno 3.480 osoba (43,2% žena i 56,8% muškaraca) koje su se, u periodu od 2017. do 2019. godine, DPST na HIV/AIDS u Savetovalištu za HIV/AIDS GZJZ Beograd. Savetnik savetovališta je od svake osobe, od koje je dobio usmeni pristanak za savetovanje pre testiranja, prikupio podatke o polu, starosnoj kategoriji, bračnom statusu, radnom odnosu, broju testiranja, ponašanju vezanom za HIV/AIDS, prosečnom broju partnera u toku jedne godine i učestalosti korišćenja kondoma. Podaci su potom uneti u

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12.6 million people are still waiting for the therapy. It is clear that timely therapy contributes to the end of the global pandemic of AIDS, as well as to the improvement of the quality of life of people with HIV and the impossibility of transmitting HIV to their HIV-negative partners through sexual intercourse (3).

Although we, as a society, made progress in knowledge about the virus and how to be protected from it, there are still a lot of people who discriminate persons who are HIV positive. Even in 25 countries around the world more than 50% of adults have discriminating attitudes towards HIV positive persons (3).

In the Republic of Serbia, according to the data of the Institute of Public Health "Dr Milan Jovanovic Batut", there were 4027 registered persons infected with HIV from 1985 to November 2019 (4). Of all the persons infected with HIV, 2022 persons had AIDS, while 1150 died of AIDS. According to the statistical data, there were 121 persons infected with HIV who died due to diseases or conditions that were not connected with HIV. During all these years, from the appearance of HIV infection in Serbia, a dominant way of transmission was sexual (89% of all cases registered in 2019), and then the unprotected anal sexual intercourse among men in newly discovered persons infected with HIV (77%), as well as in persons with the disease (56%) and in those who died of AIDS (44%). From January to November 2019, 175 newly infected persons were registered (156 men and 19 women). The greatest number of newly infected with HIV was in Belgrade, even 75 persons. As far as the way of transmission is concerned, 156 persons contracted HIV through an unprotected sexual intercourse (97.5% of all cases of known transmission). From 2017 to 2019, there came to the increase in the newly infected with HIV, as well as in newly diagnosed with AIDS. The increase in the number of newly infected with HIV and newly diagnosed with AIDS is a consequence of promotion and information about the significance of voluntary, confidential and free counseling and testing for HIV. Also, these services (counseling, informing and testing) are more available and more present in different health care institutions, as well as outside health care institutions, especially for those persons with risky behavior from key populations at the risk of getting HIV (5).

HIV testing may be initiated by the user or it may be recommended by the service provider (e.g. diagnostic HIV testing, ordered testing due to the appearance of symptoms which can be connected with HIV). Also, there is a routine testing (for example, mandatory testing which is regulated by law in services for blood transfusion for all collected blood units) and mandatory testing, according to the so called "opt in" and "opt out" models (for example, testing of pregnant women, patients who are on hemodialysis, patients who are treated at clinics for tuberculosis or venereal diseases) (6).

Within the scope of this work, the accent was put on voluntary, confidential counseling and testing for HIV, which should be based on the principles of voluntariness, confidentiality and anonymity. It has a key role in HIV prevention. The National guide of good practice for VCCT and the Protocol which defined the whole procedure of VCCT in detail and which is based on the protocols of UNAIDS and the World Health Organization have influenced good quality of work to a large extent.

In the Republic of Serbia, the development of voluntary and confidential counseling and testing for HIV/AIDS is associated with the Center for voluntary counseling and testing at the Institute for Student Health Care in Belgrade. Counselors from this Center at the Institute for Student Health Care developed a model with the United Nations and other organizations of civil society and it has been successfully applied in the governmental and non-governmental sector since 2002. VCCT means that people can get information about HIV, ways of transmission, recognize, reduce or avoid risks for HIV infection, about safe sexual behaviors, place where they can be tested and depending on the test results, how they should act in the future in order to protect themselves and other people. With a wider approach, VCCT helps to reduce discrimination of people living with HIV aimed at its elimination (7).

The aim of this cross-sectional study was to examine whether there were differences in demographic characteristics, risky behavior and HIV status between men and women who were voluntarily counseled and tested at the Counseling center of the Institute of Public Health in Belgrade from 2017 to 2019.

elektronski upitnik i analizirani u cilju ispitivanja da li postoje razlike u demografskim karakteristikama, rizičnom ponašanju i HIV statusu između muškaraca i žena.

Za statističku analizu podataka korišćeni su χ^2 ili Fišerov test. Nivo statističke značajnosti je bio $p < 0,05$. Obrada podataka vršena je unutar statističkog paketa SPSS verzija 17.

Rezultati

U periodu od 2017. do 2019. godine, na DPST u GZJZ Beograd javilo se 1.502 žene i 1.978 muškaraca (Tabela 1). Između muškaraca i žena nije bilo statistički značajnih razlika u odnosu na uzrast. Najveći deo žena (42,1%) i muškaraca (42,5%) savetovališta činile su osobe uzrasta 21-30 godina. Muškarci koji su koristili usluge DPST su značajno češće bili neoženjeni (79,7%), a žene udate (33,6%), razvedene (7,0%) ili udovice (1,3%). Takođe, muškarci su značajno češće bili nezaposleni (21,8%), učenici (1,8%), studenti (10,6%) i penzioneri (3,9%), a žene zaposlene (67,1%).

Tokom poslednje tri godine muškarci su značajno češće koristili DPST dva i više puta (55,1%) nego žene (28,3%) (Tabela 2). Takođe, među testiranim muškarcima je bilo značajno više HIV pozitivnih (2,5%) nego među ženama (0,3%).

Žene su se značajno češće javljale na DPST usled moguće izloženosti HIV infekciji heteroseksualnim kontaktom (84,9%), akcidentalno (11,1%) i silovanjem (1,0%), a muškarci usled heteroseksualnog odnosa (59,3%), homoseksualnog i biseksualnog kontakta (33,6%) i intravenoznog korišćenja droge (1,1%) (Tabela 3). Žene su značajno češće bile bez partnera ili sa jednim partnerom ili neizjašnjene u odnosu na muškarce. Muškarci su značajno češće koristili kondome uvek ili često (40,1%) i imali dva ili više partnera (53,2%) tokom poslednjih 12 meseci nego žene (24,2% i 20,6%).

Posle DPST-a 5 žena i 49 muškaraca je bilo HIV pozitivno (Tabela 4). HIV pozitivne žene su bile starije od 31 godine, dve su bile zaposlene, a tri nezaposlene. Na osnovu bračnog statusa tri žene su bile udate, jedna razvedena i jedna neudata. Najveći procenat HIV pozitivnih muškaraca je bio uzrasta od 21 do 40 godina (79,6%), neoženjenih

Tabela 1. Distribucija muškaraca i žena korisnika DPST u GZJZ Beograd u odnosu na njihove demografske karakteristike, period 2017-2019. godine

Karakteristike	Pol				p vrednost*
	Ženski		Muški		
	Broj N=1502	%	Broj N=1978	%	
Uzrast (godine)					
do 20	74	4,9	92	4,7	
21 – 30	632	42,1	841	42,5	
31 – 40	534	35,6	636	32,2	
41 – 50	169	11,3	244	12,3	
51 +	93	6,2	165	8,3	0,055
Bračni status					
Udata/oženjen	483	33,6	237	12,7	
Neudata/neoženjen	834	58,1	1481	79,7	
Udovica/udovac	18	1,3	16	0,9	
Razvedena/razveden	101	7,0	125	6,7	0,001
Radni status					
Zaposleni	961	67,1	1157	61,9	
Nezaposleni	303	21,2	407	21,8	
Učenici	17	1,2	34	1,8	
Studenti	124	8,7	198	10,6	
Penzioneri	27	1,9	73	3,9	0,001

*prema χ^2 testu; DPST - dobrovoljno poverljivo savetovanje i testiranje; GZJZ - Gradski zavod za javno zdravlje Beograd

Methods

A cross-sectional study was used for this research. The study included 3480 persons (43.2% of women and 56.7% of men) who were voluntarily counseled and tested for HIV/AIDS at the Counseling Center for HIV/AIDS at the Public Health Institute in Belgrade from 2017 to 2019. Before testing, each person gave oral consent for counseling to the counselor, and the counselor collected data about sex, age, marital status, employment status, the number of tests, behavior related to HIV/AIDS, the average number of partners during one year and the frequency of using condoms. Data were later entered into the electronic questionnaire and analyzed with the aim of investigating whether there were differences in demographic characteristics, risky behavior and HIV status between men and women.

χ^2 or Fisher's test was used for the statistical analysis of data. The level of statistical significance was $p < 0.05$. The analysis of data was done with the help of statistical package SPSS version 17.

Results

During the period from 2017 to 2019, 1,502 women and 1,978 men came to the Institute of Public Health in Belgrade for voluntary and confidential counseling and testing (Table 1). There was no statistically significant difference between men and women regarding age. The greatest part of women (42.1%) and men (42.5%) at this counseling center were persons aged 21 to 30. Men who used services of voluntary counseling and testing were significantly more often unmarried (79.7%), while women were married (33.6%), divorced (7.0%) or widows (1.3%). Also, men were significantly more often unemployed (21.8%), pupils (1.8%), students (10.6%) and retired (3.9%), while women were employed (67.1%).

During the last three years, men used VCCT significantly more often, two times more (55.1%) than women (28.3%) (Table 2). Also, there were significantly more HIV positive men (2.5%) than women (0.3%) among the tested persons.

Table 1. Distribution of male and female users of VCCT at the IPHB according to their demographic characteristics in the period 2017-2019

Characteristics	Sex				p value*
	Female		Male		
	Number N=1502	%	Number N=1978	%	
Age (years)					
to 20	74	4.9	92	4.7	
21 – 30	632	42.1	841	42.5	
31 – 40	534	35.6	636	32.2	
41 – 50	169	11.3	244	12.3	
51 +	93	6.2	165	8.3	0.055
Marital status					
Married	483	33.6	237	12.7	
Unmarried	834	58.1	1481	79.7	
Widow/widower	18	1.3	16	0.9	
Divorced	101	7.0	125	6.7	0.001
Employment status					
Employed	961	67.1	1157	61.9	
Unemployed	303	21.2	407	21.8	
Pupils	17	1.2	34	1.8	
Students	124	8.7	198	10.6	
Retired	27	1.9	73	3.9	0.001

*according to χ^2 test; VCCT – voluntary confidential counseling and testing; IPHB - Institute of Public Health in Belgrade.

Tabela 2. Distribucija muškaraca i žena korisnika DPST u GZJZ Beograd u odnosu na njihove navike, period 2017-2019. godine

Karakteristike	Pol				p vrednost*
	Ženski		Muški		
	Broj N=1502	%	Broj N=1978	%	
Broj poseta DPST					
1	1068	71,5	883	44,8	
2	328	22,0	593	30,1	
3+	98	6,3	496	25,0	0,001
HIV status					
Pozitivan	5	0,3	49	2,5	
Negativan	1497	99,7	1929	97,5	
Ukupno	1502	100,0	1978	100,0	0,001

*prema χ^2 testu; DPST - dobrovoljno poverljivo savetovanje i testiranje; GZJZ - Gradski zavod za javno zdravlje Beograd

Tabela 3. Distribucija muškaraca i žena korisnika DPST u GZJZ Beograd u odnosu na njihovo ponašanje, period 2017-2019. godine

Karakteristike	Pol				p vrednost*
	Ženski		Muški		
	Broj N=1502	%	Broj N=1978	%	
Rizici					
Akcident	167	11,1	84	4,3	
Homoseksualni i biseksualni odnosi	14	0,9	664	33,6	
Heteroseksualni odnosi	1275	84,9	1173	59,3	
Intravenski korisnici droga	7	0,5	21	1,1	
Trasfuzija krvi	7	0,5	1	0,1	
Silovanje	15	1,0	3	0,2	
Više rizika	17	1,1	32	1,6	0,001
Broj partnera u poslednjih 12 meseci					
Bez partnera	41	2,7	49	2,5	
Jedan	598	39,8	525	26,5	
Dva	173	11,5	312	15,8	
Tri	60	4,0	166	8,4	
Četiri i više	77	5,1	574	29,0	
Neizjašnjeno	553	36,8	352	17,8	0,001
Korišćenje kondoma					
Uvek/često	364	24,2	794	40,1	
Retko/nikad	1138	75,8	1184	59,8	0,001

*prema χ^2 testu; DPST - dobrovoljno poverljivo savetovanje i testiranje; GZJZ - Gradski zavod za javno zdravlje Beograd

Table 2. Distribution of male and female users of VCCT at the IPHB according to their habits during the period 2017-2019

Characteristics	Sex				p value*
	Female		Male		
	Number N=1502	%	Number N=1978	%	
Number of visits to VCCT					
1	1068	71.5	883	44.8	
2	328	22.0	593	30.1	
3+	98	6.3	496	25.0	0.001
HIV status					
Positive	5	0.3	49	2.5	
Negative	1497	99.7	1929	97.5	
Total	1502	100.0	1978	100.0	0.001

*according to χ^2 test or Fisher's test; VCCT – voluntary confidential counseling and testing; IPHB - Institute of Public Health in Belgrade.

Table 3. Distribution of male and female users of VCCT at the IPHB according to their behavior during the period 2017-2019

Characteristics	Sex				p value*
	Female		Male		
	Number N=1502	%	Number N=1978	%	
Risks					
Accident	167	11,1	84	4,3	
Homosexual and bisexual relations	14	0,9	664	33,6	
Heterosexual relations	1275	84,9	1173	59,3	
Intravenous drug abusers	7	0,5	21	1,1	
Blood transfusion	7	0,5	1	0,1	
Raping	15	1,0	3	0,2	
Multiple risks	17	1,1	32	1,6	0,001
Number of partners during the last 12 months					
Without partner	41	2,7	49	2,5	
One	598	39,8	525	26,5	
Two	173	11,5	312	15,8	
Three	60	4,0	166	8,4	
Four and more	77	5,1	574	29,0	
Not answered	553	36,8	352	17,8	0,001
Use of condoms					
Always/often	364	24,2	794	40,1	
Rarely/never	1138	75,8	1184	59,8	0,001

*according to χ^2 test or Fisher's test; VCCT – voluntary confidential counseling and testing; IPHB -Institute of Public Health in Belgrade.

Tabela 4. Distribucija HIV pozitivnih osoba koje su se javile na DPST u GZJZ u odnosu na njihove demografske karakteristike, period 2017-2019. godine

Karakteristike	Pol			
	Ženski		Muški	
	Broj N=5	%	Broj N=49	%
Uzrast (godine)				
do 20	0	0,0	1	2,0
21 – 30	0	0,0	17	34,7
31 – 40	1	20,0	22	44,9
41 – 50	1	20,0	7	14,3
51 +	3	60,0	2	4,1
Bračni status				
Udata/oženjen	3	60,0	2	4,1
Neudata/neoženjen	1	20,0	45	91,8
Udovica/udovac	1	20,0	2	4,1
Razvedena/razveden	101	7,0	125	6,7
Radni status				
Zaposleni	2	40,0	35	71,4
Nezaposleni	3	60.0	8	16,3
Učenici	0	0,0	1	2,0
Studenti	0	0,0	4	8,2
Penzioneri	0	0,0	1	2,0

DPST - dobrovoljno poverljivo savetovanje i testiranje; GZJZ - Gradski zavod za javno zdravlje Beograd

(91,8%) i zaposlenih (71,4%).

Sve HIV pozitivne žene su se javile na testiranje zbog rizičnog heteroseksualnog odnosa, a muškarci najčešće (77,6%) zbog rizičnih homoseksualnog i biseksualnih odnosa (Tabela 5). Tri od pet HIV pozitivnih žena su tokom prethodnih 12 meseci imale jednog partnera, a 51% HIV pozitivnih muškaraca tri i više partnera. Veći broj HIV pozitivnih žena (80,0%) nego muškaraca (67,3%) nikada nisu ili su retko koristile kondom.

Diskusija

U Savetovalištu za HIV/AIDS, GZJZ u periodu 2017-2019. godine je testirano 3.480 ispitanika (43,2% žena i 56,8% muškaraca), a u Republici Srbiji je u toku ovog perioda ukupno DPST na HIV/AIDS 24.012 osoba (5,6,10). U odnosu na pol u 2019. godini prema podacima Instituta za javno zdravlje „dr Milan Jovanović Batut", dva puta je više DPST muškaraca nego žena (4). Međutim, u našoj studiji, 1,3 puta više muškaraca nego žena je koristilo usluge DPST. Između muškaraca i žena korisnika DPST nije bilo značajne razlike u odnosu na uzrast.

Među testiranim u našoj studiji, značajno je više bilo žena (71,5%) koje su se testirale po prvi put, nego muškaraca (44,8%). Najveći procenat žena (75,8%) i muškaraca (59,8%) je retko/nikad koristio kondom. Muškarci su značajno češće imali veći broj seksualnih partnera, kao i homoseksualne i biseksualne kontakte i intravensko korišćenje droge. U mnogim studijama ukazuje se na rizičnije seksualno ponašanje muškaraca (8), pogotovo muškaraca koji imaju seksualne odnose sa muškarcima (9). Ovu populaciju karakteriše visoko rizično seksualno ponašanje, koje podrazumeva promiskuitet, veliki broj javnih mesta gde mogu upoznavati partnere i upražnjavati seksualne odnose (saune, javni toaleti, klubovi), česta upotreba psihoaktivnih supstanci, kao i eksperimentisanja sa rizikom i sopstvenom seksualnošću. Iako, HIV infekciju muškarci koji imaju seksualne odnose sa muškarcima doživljavaju kao uobičajenu bolest, zaražavanje je i dalje povezano sa stidom i krivicom (9). Istraživanje sprovedeno u Indiji, ukazuje da je rizičnije seksualno ponašanje češće među

Table 4. Distribution of HIV positive persons who came to VCCT at the IPHB according to their demographic characteristics during the period 2017-2019

Characteristics	Sex			
	Female		Male	
	Number N=5	%	Number N=49	%
Age (years)				
0 – 20	0	0.0	1	2.0
21 – 30	0	0.0	17	34.7
31 – 40	1	20.0	22	44.9
41 – 50	1	20.0	7	14.3
51 +	3	60.0	2	4.1
Marital status				
Married	3	60.0	2	4.1
Unmarried	1	20.0	45	91.8
Widow/widower	1	20.0	2	4.1
Divorced	101	7.0	125	6.7
Employment				
Employed	2	40.0	35	71.4
Unemployed	3	60.0	8	16.3
Pupils	0	0.0	1	2.0
Students	0	0.0	4	8.2
Retired	0	0.0	1	2.0

VCCT – voluntary confidential counseling and testing; IPHB - Institute of Public Health in Belgrade

Women significantly more often came to voluntary counseling and testing due to the possible exposure to HIV infection by heterosexual contact (84.9%), accident (11.1%) and raping (1.0%), while men were counseled and tested due to heterosexual contact (59.3%), homosexual and bisexual contact (33.6%) and intravenous drug abuse (1.1%) (Table 3). Women significantly more often did not have a partner or they had one partner, or they did not answer the question in comparison to men ($p < 0.001$). Men used condoms significantly more often (40.1%) and they had two or more partners during the last 12 months in comparison to women (24.2% and 20.6%).

After voluntary, confidential counseling and testing, 5 women and 49 men were HIV positive (Table 4). HIV positive women were older than 31, two of them were employed, while three were unemployed. According to the marital status, three women were married, one was divorced and one was not married. The greatest percentage of HIV positive men was in the age group 21 to 40 years (79,6%), among unmarried (91.8%) and employed men (71.4%).

All HIV positive women came to testing because of risky heterosexual relations, while men were tested mostly because of risky homo and bisexual relations (77.6%) (Table 5). Three of five HIV positive women had one partner during the last 12 months, while 51% of HIV positive men had three or more partners. Larger number of HIV positive women (80.0%) never used condoms or they used it rarely in comparison to men (67.3%).

Discussion

During the period 2017-2019, 3,480 examinees (43.2% of women and 56.8% of men) were tested at the Counseling center for HIV/AIDS of the Institute of Public Health in Belgrade, while 24.012 persons were voluntarily counseled and tested in the Republic of Serbia during this period (5,6,7). In 2019, according to the data of the Institute of Public Health "Dr Milan Jovanovic Batut" regarding examinees' sex, VCCT was two times higher among men than among women. However, in our study, VCCT was 1.3 times higher among men than among women. There was no significant difference regarding age between

Tabela 5. Distribucija HIV pozitivnih osoba koje su se javile na DPST u GZJZ u odnosu na njihovo ponašanje, period 2017-2019. godine

Karakteristike	Pol			
	Ženski		Muški	
	Broj N=1502	%	Broj N=1978	%
Rizici				
Akcident	0	0,0	1	2,0
Homoseksualni i biseksualni odnosi	0	0,0	38	77,6
Heteroseksualni odnosi	5	100,0	10	20,4
Broj partnera u poslednjih 12 meseci				
Jedan	3	60,0	7	14,3
Dva	0	0,0	4	8,2
Tri+	0	0,0	25	51,0
Neizjašnjeno	2	40,0	13	26,5
Korišćenje kondoma				
Uvek/često	1	20,0	16	32,7
Retko/nikad	4	80,0	33	67,3

DPST - dobrovoljno poverljivo savetovanje i testiranje; GZJZ - Gradski zavod za javno zdravlje Beograd

mlađim, neoženjenim i urbanim muškarcima, koji uglavnom potiču iz ekonomski bogatijih domaćinstava (8). Nalazi studije, takođe, podvlače očigledni paradoks u vezi između znanja o HIV/AIDS-u i prepuštanju rizičnom seksualnom ponašanju i usvajanju sigurnih seksualnih praksi. Preporučuje se da svi programi prevencije HIV-a u Indiji promovišu koncept muškarca kao odgovornog seksualnog partnera (8). Ovaj koncept je dobro promovisati među mladim i neoženjenim muškarcima jačanjem prelaska sa nasilja na poštovanje i promocijom kondoma.

U našoj studiji, značajno veći procenat novootkrivenih HIV pozitivnih je bio među muškarcima (2,5%), nego među ženama (0,3%). Isti odnos polova u odnosu na HIV infekciju prisutan je širom sveta sa izuzetkom regiona sub-saharske Afrike, gde žene imaju veću prevalenciju infekcije HIV-om (10). Podaci Instituta za javno zdravlje Srbije „dr Milan Jovanović Batut" ukazuju da je u 2019. godini bilo 8 puta više HIV pozitivnih muškaraca nego žena (156 muškaraca i 19 žena) (11), dok je u periodu praćenja naše studije taj odnos bio skoro 10 prema 1 (49 muškaraca i 5 žena). U periodu od januara do 20. novembra 2019. godine u Republici Srbiji, najveći broj novoobolelih bio je uzrasta od 20. do 49. godina (138 osoba tj. 79%), gde je svaka četvrta osoba uzrasta od 20 do 29 godina (43 osobe tj. 25%) (2). Međutim, u našoj studiji najviši procenat HIV pozitivnih muškaraca (44,9%) je bio uzrasta od 31. do 40. godine života, a žena (60,0%) uzrasta 51 i više godina.

Rezultati našeg istraživanja, takođe, pokazuju da je tokom poslednjih 12 meseci najviši procenat HIV pozitivnih muškaraca (36,7%) imao četiri partnera, a HIV pozitivne žene jednog (60,0%). Ukoliko posmatramo transmisionu kategoriju tokom 2018. godine u SAD-u vidimo da je homoseksualni odnos dominantan put transmisije (69%) svih novoinficiranih, a zatim heteroseksualni odnos (24%) (2). Prema podacima Instituta za Javno zdravlje „dr Milan Jovanović Batut", tokom svih godina od početka pojave HIV infekcije u Republici Srbiji, dominantan put prenosa je seksualni put prenosa (89% svih slučajeva registrovanih tokom 2019. godine), a homoseksualni odnos među muškarcima, kako među novootkrivenim osobama inficiranim HIV-om (77%), tako i među obolelima (56%) i umrlima od AIDS-a (44%) (5). Najčešći razlog testiranja na HIV/AIDS u našem istraživanju među HIV pozitivnim muškarcima je rizičan homoseksualni/biseksualni odnos (77,6%), a kod HIV pozitivnih

Table 5. Distribution of HIV positive persons who came to VCCT at the IPHB according to their behavior during the period 2017-2019

Karakteristike	Sex			
	Female		Male	
	Number N=5	%	Number N=49	%
Risks				
Accident	0	0.0	1	2.0
Homosexual and bisexual relations	0	0.0	38	77.6
Heterosexual relations	5	100.0	10	20.4
Number of partners during the last 12 months				
One	3	60.0	7	14.3
Two	0	0.0	4	8.2
Three+	0	0.0	25	51.0
Not answered	2	40.0	13	26.5
Use of condoms				
Always/often	1	20.0	16	32.7
Rarely/never	4	80.0	33	67.3

VCCT – voluntary confidential counseling and testing; IPHB - Institute of Public Health in Belgrade

men and women who were users of voluntary, confidential counseling and testing.

Among the tested persons in our study, there were significantly more women (71.5%) who were tested for the first time than men (44.8%). The greatest percentage of women (75.8%) and men (59.8%) used condoms rarely/never. Men had significantly more often larger number of sexual partners, as well as homosexual and bisexual contact and used drugs intravenously. In numerous studies, it is pointed to the risky sexual behavior of men (8), especially men who have sexual relations with men (9). This population is characterized by high-risk sexual behavior, which includes promiscuity, a large number of public places where they can meet partners and have sexual intercourse (saunas, public toilets, clubs), frequent use of psychoactive substances, as well as experimenting with risk and sexuality. Although HIV infection is perceived by men who have sex with men as a common disease, infection is still associated with shame and guilt (9). A study conducted in India indicates that risky sexual behavior is more common among younger, unmarried and urban men who are mainly from economically better-off households (8). The findings of the study also underline an apparent paradox regarding the relationship between knowledge of HIV/AIDS and indulgence in high-risk sexual behavior and adopting safe sexual practices. It is recommended that all HIV prevention programs in India should promote the concept of a man as a responsible sexual partner (8). This concept should be promoted among young and unmarried men, by reinforcing the shift from violence to respect and promoting condoms as a sexual stimulus, not as a means of disease prevention.

In our study, percentages of newly discovered HIV positive persons were significantly higher among men (2.5%) than among women (0.3%). The same ratio of sexes regarding HIV infection is present around the world with the exception of Sub-Saharan Africa, where the prevalence of HIV infection is higher among women (10). Data of the Institute of Public Health "Dr Milan Jovanovic Batut" point to the fact that in 2019 there were 8 times more HIV positive men than women (156 men and 19 women) (11), whereas during the follow-up period from our study that ratio was almost 10 to 1 (49 men and 5 women). In Republic

žena rizični heteroseksualni odnos (100%).

Naša studija pokazuje da su muškarci značajno uvek ili češće koristili kondom i imali dva ili više partnera nego žene. Ispitivanje stavova i ponašanja u vezi sa upotrebom kondoma kod muškaraca i žena koji se leče od zloupotrebe supstanci pokazuje da je i za muškarce i za žene ređa upotreba kondoma povezana sa zloupotrebom psihoaktivnih supstanci (12). Prema podacima Istraživanja zdravlja stanovništva Srbije iz 2013. godine, koju su sproveli Ministarstvo zdravlja Republike Srbije i Institut za javno zdravlje Srbije, od ukupnog broja mladih uzrasta 15-24 godine, muškarci su češće konzumirali alkohol (svaki dan ili skoro svaki dan 0,7%, 5-6 dana u nedelji 0,7%, 3-4 dana u nedelji 4,5%, 1-2 dana u nedelji 15,7%, kao i 2-3 dana mesečno 16,8%) nego žene (0,3%; 0,2%; 1,7%; 7,8%; 12%), a čak 0,7% je koristilo nedozvoljene psihoaktivne supstance (kao što su kanabis, kokain i lepak) (13). *Brooks* i saradnici su otkrili da žene koje se leče od zloupotrebe supstanci češće prijavljuju više partnera i nezaštićene seksualne odnose sa redovnim partnerima u poređenju sa muškarcima (14). Nasuprot tome, *Absalon* i saradnici su uočili da muškarci prijavljuju češće rizična seksualna ponašanja nego žene (tj. seks pod dejstvom droge ili alkohola, slučajne partnere, višestruke seksualne partnere), a žene seksualne partnere sa većim rizikom (15). Ovi podaci podržavaju potrebu da se u okviru uvođenja preventivnih intervencija treba usredsrediti na rodno specifične barijere za upotrebu kondoma, kako u cilju prevencije HIV-a, tako i drugih polno prenosivih bolesti.

Ključni nedostatak ovog istraživanja odnosi se na analizu demografskih karakteristika i rizičnog ponašanja malog broja osoba koje su u posmatranom periodu bile identifikovane kao HIV pozitivne. Međutim, ovo istraživanje ima ogroman značaj u prepoznavanju važnosti Savetovališta za HIV/AIDS u cilju ranog otkrivanja osoba sa HIV/AIDS-om, kao i za identifikovanja rizičnih oblika ponašanja radi primene adekvatnih mera prevencije u borbi protiv HIV/AIDS-a.

Zaključak

Na osnovu rezultata, može se zaključiti da je među testiranim osobama u Savetovalištu za HIV/AIDS, GZJZ, u periodu 2017-2019. godine, bilo najviše mladih osoba, uzrasta od 21. do 30. godine. Pozitivni HIV status najviše je zabeležen kod osoba uzrasta od 31. do 40. godina. Stoga, edukacija mladih o bezbednim obrascima seksualnog ponašanja i isticanje značaja pravovremenog savetovanja i testiranja je neophodno. Potrebno je vršiti promovisanje Savetovališta za DPST i u starijim uzrastima, jer je kontinuirana promocija DPST-a zadatak na kome treba intenzivno raditi kako bi odgovor na HIV epidemiju bio uspešniji. Takođe, potrebno je raditi na promovisanju preekspozicione i postekspozicione profilakse antiretrovirusnim lekovima, kao i na prevenciji transmisije HIV infekcije sa majke na dete.

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of Serbia, from January 2019 to 20th November 2019, the largest number of newly infected was in the age group 20 to 49 years (138 persons, that is, 79%), where every fourth person was in the age group 20 to 29 (43 persons, that is, 25%) (2). However, in our study, the highest percentage of HIV positive men (44.9%) was in the age group 31 to 40 years, while the highest percentage of HIV positive women (60.0%) was in the age group 51 years and older.

The results of our research also show that the highest percentage of HIV positive men (36.7%) had four partners, while HIV positive women had one partner (60.0%) during the last 12 months. If we observe the transmission category in the USA during 2018, we see that homosexual relation was a dominant way of transmission (69%) of all newly infected persons, and then heterosexual relation (24%) (2). According to the data of the Institute of Public Health "Dr Milan Jovanovic Batut", during all these years since the appearance of HIV infection in Serbia, a dominant way of transmission was sexual transmission (89% of all registered cases in 2019), while homosexual relations were dominant among men, in newly discovered persons infected with HIV (77%), as well as in those with the disease (56%) and in those who died of AIDS (44%) (5). The most common reason for HIV/AIDS testing in our study among HIV-positive men was risky homosexual/ bisexual intercourse (77.6%), and in HIV-positive women risky heterosexual intercourse (100%).

Our study shows that men significantly more often or always used condoms and had two or more partners in comparison to women. The investigation of attitudes and behaviors regarding the use of condoms in men and women who were treated due to drug abuse shows that the existence of barriers for the use of condoms is associated with the rarer use of condoms (12). According to the data of the Health Survey of the Population of Serbia from 2013, conducted by the Ministry of Health of the Republic of Serbia and the Institute of Public Health of Serbia, out of the total number of young people aged 15-24, men consumed alcohol more often (every day or almost every day 0.7 %, 5-6 days a week 0.7%, 3-4 days a week 4.5%, 1-2 days a week 15.7%, as well as 2-3 days a month 16.8%) than women (0.3%; 0.2%; 1.7%; 7.8%; 12%), and as many as 0.7% used illicit psychoactive substances (such as cannabis, cocaine, and glue) (13). Brooks and coworkers found that women treated for substance abuse were more likely to report multiple partners and unprotected sex with regular partners compared to men (14). In contrast, Absalon and coworkers observed that men reported more frequent risky sexual behaviors than women (i.e., sex under the influence of drugs or alcohol, casual partners, multiple sexual partners), and women reported higher-risk sexual partners (15). This data supports the need to focus on gender-specific barriers to condom use as part of the introduction of preventive interventions, both for the prevention of HIV and other sexually transmitted diseases.

The key shortcoming of this research relates to the analysis of demographic characteristics and risk behavior of a small number of people who were identified as HIV positive in the observed period. However, this research is of great importance in recognizing the importance of the HIV / AIDS Counseling Center for the early detection of people living with HIV / AIDS, as well as in identifying risky behaviors in order to implement adequate prevention measures in the fight against HIV / AIDS.

Conclusion

According to the results, one may conclude that during the period 2017-2019, the majority of persons tested at the Counseling center for HIV/ AIDS of the Institute of Public Health were young aged 21 to 30 years. The positive HIV status was noted mostly in persons aged 31 to 40 years. Therefore, educating young people about safe patterns of sexual behavior and emphasizing the significance of timely counseling and testing are necessary. The promotion of the Counseling center for HIV/AIDS is needed in older age, because the continuous promotion of voluntary, confidential counseling and testing represents a task, which should be intensively worked on in order to have a more successful response to the epidemic of HIV. It is also necessary to work on the promotion of pre-exposure and post-exposure prophylaxis with antiretroviral drugs, as well as on the prevention of mother-to-child transmission of HIV infection.

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PRIKAZ SLUČAJA

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LEZIJE NA MEKOM NEPCU IZAZVANE ORALNIM SEKSUALNIM ODNOSOM: PRIKAZ PACIJENTA

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SAŽETAK

Uvod/Cilj: Oralni seks je česta praksa kod seksualno aktivnih osoba svih uzrasta, uključujući i tinejdžere i može biti praćen polno prenosivim infekcijama ili povredama oralne ili genitalne regije. Cilj rada je bio da prikaže promene na mekom nepcu nastale nakon receptivnog oralnog seksualnog odnosa.
Prikaz pacijenta: Prikazan je učenik star 17 godina koji se javio na pregled zbog purpuričnih promena na mekom nepcu nastalih usled oralnog seksa koje su se spontano povukle u narednih deset dana.
Zaključak: Specijalisti oralne medicine bi trebalo da imaju na umu da petehijalne oralne lezije mogu biti posledica oralnog seksa te podaci o ovoj vrsti seksualne prakse bi trebalo da budu sastavni deo anamneze.

Ključne reči: oralni seks, trauma, oralne lezije

Uvod

Oralni seks je česta vrsta seksualne aktivnosti koju praktikuju osobe oba pola i različite starosne dobi, uključujući i adolescente. Podrazumeva oralno genitalni seks (felacio i kunilingus) i oralno analni seks (anilingus) koji se mogu praktikovati kao jedina vrsta seksualnog odnosa ili zajedno sa vaginalnim i analnim seksualnim odnosima. Istraživanja iz Sjedinjenih Američkih Država su pokazala da su 48% muškaraca od 15 do 19 godina, 80% muškaraca od 20 do 24 godine i čak 90% muškaraca od 25 do 44 godine praktikovali oralni seks sa osobama suprotnog pola (1). Druga studija iz iste države je opisala da je 72,7% muškaraca koji imaju seks sa muškarcima tokom poslednjeg seksualnog odnosa praktikovalo oralni seks (2).

Oralnim seksom se mogu preneti sve polno prenosive infekcije (3), a tokom ove vrste aktivnosti mogu nastati i povrede usne duplje i genitalija. Tokom epidemije sifilisa u Beogradu među muškarcima koji imaju seks sa muškarcima, čak 59% pacijenata je oboljenje dobilo isključivo nakon oralnog seksualnog odnosa (4). Povrede usne duplje se najčešće javljaju nakon felacia kod receptivnog seksualnog partnera i prema podacima iz literature obično su opisane kod osoba ženskog pola (5,6).

Cilj ovog rada je bio da prikaže promene u usnoj duplji tinejdžera koje su nastale kao posledica oralnog seksualnog odnosa.

Prikaz pacijenta

Učenik star 17 godina javio se na dermatovenerološki pregled zbog promena koje je slučajno primetio u usnoj duplji tokom pranja zuba. Bio je poprilično uplašen da nije u pitanju neka polna bolest jer je pre dva dana imao grublji receptivni oralni seksualni odnos sa nepoznatim partnerom. Pacijent nije imao nikakvih tegoba i bio je dobrog opšteg zdravlja. Pregledom usne duplje utvrđene su purpurične promene na mekom nepcu (slika 1) koje su se spontano povukle u toku narednih deset dana. Nakon osam nedelja od seksualnog odnosa rađene su analize krvi na HIV infekciju i sifilis i serološki testovi su bili negativni.

Diskusija

Ispitivanje sprovedeno u našoj sredini je pokazalo da je oralni seksualni odnos česta praksa, naročito u populaciji muškaraca koji imaju seks sa muškarcima, ali znanja muškaraca u Beogradu o rizicima oralnog seksa bila su prilično oskudna

CASE REPORT

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LESIONS ON THE SOFT PALATE CAUSED BY ORAL SEXUAL INTERCOURSE: A CASE REPORT

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SUMMARY

Background/Aim: Oral sex is a common practice in sexually active people of all ages, including teenagers and can be accompanied by sexually transmitted infections and trauma of the oral or genital region. The aim of this study was to present the lesions on the soft palate that occurred after receptive oral sexual intercourse.
Case report: We present a 17-year-old student with fellatio-associated purpuric lesions on the soft palate, which disappeared spontaneously within ten days.
Conclusion: Dental care professionals should be aware that petechial oral lesions may result from sexual intercourse and data on oral sex practice should always be taken.

Key words: oral sex, trauma, oral lesions

Introduction

Oral sex is a common sexual activity which is practiced by people of both sexes and different ages, including adolescents. It includes oral genital sex (fellatio and cunnilingus) and oral anal sex (anulingus), which may be practiced as the only kind of sexual intercourse or together with vaginal and anal sexual intercourse. Studies from the United States of America showed that 48% of men aged 15 to 19, 80% of men aged 20 to 24 and even 94% of men aged 25 to 44 practiced oral sex with the opposite sex (1). Another study from the same country described how 72.7% of men, who had sex with men, practiced oral sex during the last sexual intercourse (2).

All sexually transmitted infections can be contracted through oral sex (3), while trauma of the oral and genital region may appear during this kind of activity. During the epidemic of syphilis in Belgrade among men who had sex with men, even 59% of patients contracted the disease exclusively after oral sexual intercourse (4). Traumas of the oral cavity most frequently appear after fellatio in a receptive sexual partner and according to the data from literature, these injuries are usually described in females (5,6).

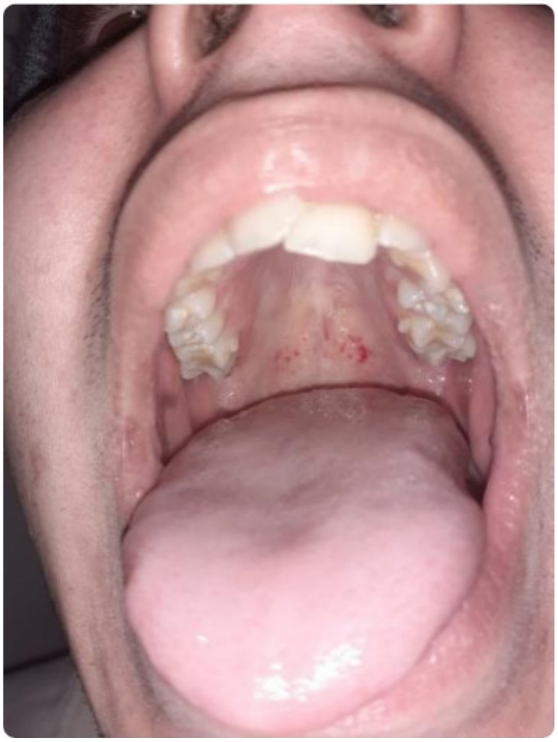
The aim of this study was to present changes in the oral cavity of a teenager that appeared as a consequence of oral sexual intercourse.

Case report

A 17-year-old student came to the dermatovenerological examination due to the changes in the oral cavity that he noticed by accident while he was brushing his teeth. He was quite scared that it might be a sexually transmitted disease because he had had a rough receptive sexual intercourse with an unknown partner two days before. He did not have any troubles and his general health condition was good. The examination of oral cavity established purpuric lesions on the soft palate (Picture 1), which spontaneously disappeared within the next ten days. After eight weeks from the sexual intercourse, blood tests were done for HIV infection and syphilis and serological findings were negative.

Discussion

The research was conducted in our environment and it showed that oral sex is a common



Slika 1. Purpurične lezije na tvrdom nepcu

(7). Jedna četvrtina ispitanika je smatrala da se oralnim seksom ne mogu preneti polne bolesti, a čak 95% njih nije koristilo kondom tokom ove vrste seksualne aktivnosti.

Povrede usne duplje mogu nastati nakon oralnog seksualnog odnosa, ali su često asimptomatske te ih osoba ni ne registruje, a ako se promene uoče, obično su praćene strahom da se radi o nekoj polnoj infekciji (8). Tokom felacija usled jačeg pritiska penisa na nepce receptivnog partnera nastaje negativni pritisak praćen pojavom eritema, petehija i purpure obično na mekom nepcu ili mestu prelaza tvrdog u meko nepce. Ove promene su bezbolne i mogu biti bilateralne kao kod našeg pacijenta, ili, pak, samo sa jedne strane mekog nepca dok su ostali delovi orofarinksa obično pošteđeni (6).

U diferencijalnoj dijagnozi purpuričnih promena na mekom nepcu (5) pominju se krvne diskrazije (hemofilija, idiopatska trombocitopenična purpura, diseminovana intravaskularna koagulacija), povećana fragilnost kapilara (paroksizmalni kašalj, kijanje ili povraćanje), infektivne bolesti (mononukleoza, streptokokne infekcije), primena lekova (antikoagulansi, preparati acetilsalicilne kiseline), karcinomi nazofarinksa i ostale zadesne ili jatrogene povrede (intubacija, nazogastrična sonda). S obzirom na to da je naš pacijent bio potpuno zdrav i da je dao podatak o skorašnjem receptivnom oralnom seksu, pregledom i anamnezom je utvrđeno da se radi o traumatskim purpuričnim lezijama mekog nepca nastalim tokom felacija.

Zaključak

Kod pojave purpuričnih promena na mekom nepcu, specijalisti oralne medicine bi u okviru anamneze trebalo da uzmu i podatke o eventualnim oralnim seksualnim odnosima, a sve sa ciljem lakšeg postavljanja dijagnoze.

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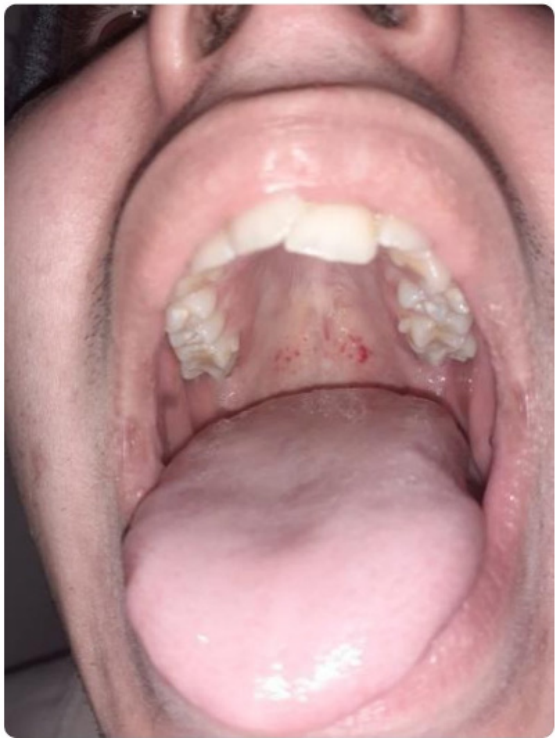

Figure 1. Purpuric lesions on the soft palate

practice, especially in the population of men who have sex with men, but in Belgrade their knowledge about risks pertaining to oral sex was rather scarce (7). One quarter of examinees claimed that sexually transmitted diseases could not be transmitted through oral sex, while 95% of them did not use condoms during this sexual activity.

Injuries of the oral cavity can appear after the oral sexual intercourse, but they are often asymptomatic and therefore, a person does not notice them, and if these changes are noticed, they are accompanied by the fear that it is a sexually transmitted infection (8). During fellatio due to a stronger pressure of penis on the palate of a receptive partner, a negative pressure appears that is followed by the appearance of erythema, petechiae and purpura usually on the soft palate or at the junction between the soft and hard palate. These changes are painless and they can be bilateral as in our patient, or they can appear just at one side of the soft palate while other parts of oropharynx remain undamaged (6).

In a differential diagnosis of purpuric lesions on the soft palate (5), the following is mentioned: blood dyscrasia (hemophilia, idiopathic thrombocytopenic purpura, disseminated intravascular coagulation), increased capillary fragility (paroxysmal cough, sneezing or vomiting), infectious diseases (mononucleosis, streptococcal infections), the application of drugs (anticoagulants, preparations of acetylsalicylic acid), cancer of nasopharynx, and other accidental and iatrogenic injuries (intubation, nasogastric tube). Considering the fact that our patient was completely healthy and that he reported on the recent receptive oral sex, the examination and anamnesis established that these changes were traumatic purpuric lesions of the soft palate that appeared during fellatio.

Conclusion

In case of purpuric lesions that appear on the soft palate, dental care professionals should take data about possible oral sexual intercourse in order to establish diagnosis more easily.

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STRUČNI RAD

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PSIHOLOŠKE GRUPE PODRŠKE ZA PACIJENTE NA HOSPITALNOM TRETMANU NA ODELJENJU ZA RADIOTERAPIJU

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SAŽETAK

Uvod/Cilj: Istraživanja pokazuju da psihosocijalna podrška aktivira sopstvene resurse i obezbeđuje bolji kvalitet života onkoliškim pacijentima koji se bore kako sa svojom bolešću, tako i sa nuspojavama terapije. Cilj ovog rada je da ispita da li povezivanje hospitalizovanih onkoloških pacijenata na osnovu sličnog emocionalnog iskustva tokom lečenja može da pomogne u suočavanju sa bolešću i prihvatanju lečenja.
Metode: U septembru 2019. započet je program psiholoških grupa podrške pacijentima na Odeljenju radioterapije Instituta za okologiju Kliničkog centra Crna Gora (KCCG). U osmišljavanju sadržaja radionica, korišćena su sopstvena znanja iz oblasti zdravstvene psihologije, primenjenih psiholoških tehnika i psihoterapije, a poseban naglasak stavljen je na *mindfulness* ili punoj svesnosti. Radionicama je bilo obuhvaćeno 58 obolelih (36 žena i 22 muškarca). Sastojale su se od 7 segmenata i izvodile su se jednom mesečno u trajanju od 1 sat i 30 minuta tokom šest meseci.
Rezultati: Kvalitativna analiza sadržaja radionica i praćenje pacijenata koji su prošli kroz njih pokazuju da organizovanje grupa podrške ima svoj smisao i svrhu i mnogobrojne koristi, pre svega u domenu prihvatanja bolesti, prevazilaženja emocionalnih blokada, jačanju kapaciteta *selfa* i orijentisanju na ostale životne okolnosti, mimo sopstvene bolesti.
Zaključak: Neophodno je organizovati ovakav vid radionica i za pacijente koji se leče ambulantnim putem, kao i uvesti nove segmente u sadržaj radionica.

Ključne riječi: psihoonkologija, grupe podrške, psihosocijalna podrška

Uvod

Nesporni su benefiti samog psihološkog tretmana onkoloških pacijenata, što potvrđuju i praksa i istraživanja (1,2). Rezultati pokazuju da su žene obolele od raka dojke koje su prošle psihosocijalnu podršku pre bile u stanju da aktiviraju sopstvene resurse i održe određeni kvalitet života, kao i da se nose sa nuspojavama terapije u odnosu na one koje nisu imale psihosocijalnu podršku (2). Ističe se značaj holističkog i personalizovanog pristupa pacijentu. Kod onkoloških pacijenta kod kojih je registrovan značajan nivo anksioznosti i depresivnosti, utvrđeno je da nisu imali nikakav oblik savetodavne pomoći ili psihološkog tretmana na osnovu čega se zaključuje da bi bilo poželjno na početku lečenja uraditi sistemski skrining, kako bi se prepoznali pacijenti kojima bi bio neophodan psihološki tretman (1). Dakle, uloga psihologa je u proceni i intervenciji u pogledu održavanja što boljeg kvaliteta života (3), kao i što adekvatnijem prevazilaženju teškoća koje ova situacija sa sobom nosi. Čak i kada su ispitivanja pokazala da su ispitanici sasvim dobro funkcionisali, i kod njih je postojala potreba za podrškom (4).

Svaki oblik ozbiljnih promena koji se dešava nakon što neko postane onkološki pacijent, predstavlja izazov za *self* koncept te individue (3), pa je poželjno promene uklopiti u sistem funkcionisanja osobe, uz što je moguće veće očuvanje sopstvenog identiteta, sposobnosti, socijalnih kontakata i svakodnevnih aktivnosti. Ranije istraživanje koje je ispitivalo da li je došlo do smanjenja stresa kod onkoloških pacijenata uz pomoć *mindfulness*, po-

PROFESSIONAL ARTICLE

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PSYCHOLOGICAL SUPPORT GROUPS FOR HOSPITAL PATIENTS UNDERGOING TREATMENT IN THE RADIOTHERAPY DEPARTMENT

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SUMMARY

Introduction/Aim: Research has shown that psychosocial support activates patients' resources and provides a better quality of life to oncology patients who struggle with the disease and side-effects of the therapy. The aim of this study was to examine whether connecting hospitalized patients based on a similar emotional experience during treatment could help them in coping and accepting the treatment.
Methods: In September 2019, we began the program of psychological support groups with patients at the Department of Radiotherapy of the Institute of Oncology, Clinical Center of Montenegro. While designing the content of the workshops, we used our own knowledge in the field of health psychology, applied psychological techniques and psychotherapy, and placed special emphasis on mindfulness or full awareness. Our sample consisted of 58 workshop participants, 36 were women and 22 were men. The workshops consisted of 7 segments and they were organized once in a month during six months and lasted 1 hour and 30 minutes.
Results: Qualitative analysis of the content of the workshops and subsequent monitoring of patients who went through them shows that organizing support groups has its meaning and purpose and many benefits, primarily in the field of accepting the illness, overcoming emotional blockages, strengthening self-capacity and focusing on other life circumstances, besides their disease.
Conclusion: It is necessary to organize this type of workshops for patients who are treated on an outpatient basis, as well as to introduce new segments in the content of the workshops.

Key words: psycho-oncology, support groups, psychosocial support

Introduction

The benefits of psychological treatment of oncology patients are indisputable, which is confirmed in practice and studies, as well (1,2). The results showed that women with breast cancer, who had received the psychosocial support, were able to activate their own resources and maintain certain quality of life, as well as to cope with the side-effects of the therapy in comparison to those women who had not received the psychosocial support (2). The significance of holistic and personalized approach to patients was emphasized. In oncology patients, in whom a significant level of anxiety and depression was registered, it was found that they had not received any counseling or psychological treatment, and therefore, one may conclude that it would be necessary to perform a systematic screening in the beginning of treatment in order to identify patients who would necessarily need psychological treatment. Thus, psychologists' role is important for the assessment and intervention regarding the maintenance of good quality of life (3), as well as for more adequate overcoming the obstacles that this situation carries with itself. Even when findings showed that examinees' functioning was quite good, they still needed support (4).

Each form of serious changes that occur after one becomes an oncology patient represents a challenge to the self concept of that person (3), and therefore, it is necessary to fit these changes into the system of that person's functioning, and maintain identity, abilities, social contacts and

kazalo je da je kod učesnika odmah nakon treninga izveštavano da je došlo do boljeg kvaliteta života, više životne radosti i manje fizičkih simptoma (5). Ovi rezultati su bili još bolji nakon jednogodišnjeg praćenja, jer je došlo do umanjenja depresivnosti, besa, poremećaja raspoloženja uopšte i povišenja energije usled primene *mindfulness*. To znači da *mindfulness* pomaže u prevazilaženju stresa izazvanog životno ugrožavajućim oboljenjima i da dovodi do poboljšanja opšteg stanja (5).

Cilj psiholoških tetmana bi bio da život ne stane, da se smisao života ne izgubi, već da pacijenti, iako imaju doživljaj gubitka, gubitak pretvore u svoju korist. Preporučuje se da psihološka podrška podrazumeva i rad sa medicinskim osobljem, u cilju većeg usmeravanja lekara i ostalih zdravstvenih radnika ka pacijentovim potrebama, perspektivama i iskustvu i da im se da mogućnost učešća u sopstvenom lečenju (6).

Cilj ovog rada je da ispita da li povezivanje hospitalizovanih onkoloških pacijenata na osnovu sličnog emocionalnog iskustva tokom lečenja može da pomogne u suočavanju sa bolešću i prihvatanju lečenja.

Metode

U okviru radionice (fokus grupe) bilo je uključeno 58 učesnika, od kojih je bilo 36 (62,1%) žena i 22 (37,9%) muškarca. Svi su bili hospitalizovani na Odjeljenju za radioterapiju usled različite onkološke dijagnoze (kancer dojke, grlića materice, pluća, prostate, debelog crijeva) u period od septembra 2019. godine do marta 2020. godine. Ispitanici su bili različite starosne dobi, od 32 do 76 godina (43,2±7,9).

Sve osobe su pohađale radionice tokom 6 meseci. Bile su organizovane jednom mesečno i trajale su 1 sat i 30 minuta. Svaka radionica sastojala se iz sedam delova: uvoda, razmene iskustva, vežbe „misli tada i sada", vežbe benefita, vežbe vizualizacije, osvrta na talente i hobije.

U uvodnom delu su se predstavljali psiholozi, govoreći o cilju radionica i garantujući učesnicima tajnost podataka. Razmena iskustava, kao poseban segment, podrazumevao je da svi učesnici govore o svojim iskustvima vezanim za bolest i lečenje. Potom u delu „misli tada i sada" učesnici su imali zadatak da na dve strane papira napišu kako su razmišljali kada im je dijagnostikovano maligno oboljenje, a kako sada razmišljaju. U delu pod nazivom „vežbe benefita" učesnici su pokušavali da pronađu koristi od situacije u kojoj se nalaze, tj. da pomere fokus sa nesporno velikog broja negativnih aspekata ove situacije na moguće postojanje i nekog pozitivnog aspekta. „Vežbe vizualizacije" imale su za cilj da ispitanici stave sebe u kontekst izlečene osobe, te da zamisle da je umesto kancera neki oblik sa nesporno pozitivnom valencom (sunce, cvet, zvezda, srce…) ili pak da kancera uopšte nema u organizmu. U delu pod nazivom „osvrt na talente i hobije" učesnici su govorili o svojim talentima, veštinama, hobijima i aktivnostima koje im prijaju. Poslednji deo odnosio se na diskusiju gde su ispitanici mogli da postavljaju pitanja psiholozima. Pitanja su mogla da se odnose na samu radionicu, vežbe, metode samopomoći ili bilo koje nedoumice oko kojih su psiholozi svojim stručnim znanjem mogli pomoći. Takođe, davali su svoje komentare na radionice i predloge za njihovo unapređenje.

Podaci o ispitanicima su dobijani u okviru ovog istraživanja kroz svih 7 delova radionice, stalnim beženjem svih stavova ispitanika diktafonom. Moderatori radionica je bio psiholog. Rad u radionicama odgovarao je radu u fokus grupi.

Rezultati

U prva dva segmenta radionica imali smo manje strukturisane sadržaje koji su služili razvijanju odnosa poverenja i povezivanju između učesnika, kroz slična iskustva i doživljaje. U trećem segmentu učesnici su poredili svoja razmišljanja i emocionalna stanja u trenutku saznavanja za maligno oboljenje i sadašnja razmišljanja i stanja. Ova vežba je bila fokusirana na polarizaciju koja se javlja kod pacijenata, u pogledu emocija, a pod uticajem razmišljanja o situaciji. Najčešći odgovori bili su inicijalni strah nasuprot rasterećenju u sadašnjem trenutku, potom briga nasuprot prihvatanju, smirenost nasuprot veri, potom konstantna borba nasuprot pasivnosti, zatim hrabrost naspram povlačenja. Jako mali broj ispitanika izjavilo je da nema razlike u emocionalnom stanju i razmišljanjima između trenutka saznavanja bolesti i sadašnjeg trenutka.

U vežbi benefita, kao dobre strane situacije u kojoj se učesnici nalaze, navodili su: bolja briga o sebi, bliskost sa ljudima, bolji uvid u odnose, važnost očuvanja zdravlja, razlikovanje bitnog od nebitnog, zahvalnost i samospoznaja i veoma retko nisu uspeli da saopšte benefite.

daily activities as much as possible. The previous study, which explored mindfulness-based stress reduction, showed that examinees were reported to have a better quality of life, more life joy and fewer physical symptoms immediately after the training (5). These results were even better after the follow-up which lasted one year, because a decrease was found in depression, anger, mood disturbances, while vigor increased due to the application of mindfulness. This means that mindfulness helps to overcome the stress caused by life-threatening diseases and it leads to the improvement of overall well-being (5).

The goal of psychological treatment would be to help patients preserve the will to live, meaning in life, and although they might have the feeling of loss, to help them turn that loss into their advantage. It is recommended that psychological support should include work with the medical personnel in order to focus doctors and other healthcare workers on patient's needs, perspectives and experience, and to give patients the possibility to take part in their own treatment (6).

The aim of this study is to examine whether connecting hospitalized cancer patients based on the similar emotional experience during treatment could help to cope with the disease and accept the treatment.

Methods

The study included 58 participants of the workshops, 36 women (62.1%) and 22 men (37.9%). All of them were hospitalized at the Department for Radiotherapy due to different cancer diagnoses (breast cancer, cervical cancer, lung, prostate or colorectal cancer) from September 2019 to March 2020. The participants were of different ages, from 36 to 76 (43.2±7.9).

All the participants attended workshops during six months. The workshops were organized once in a month, and they lasted 1 hour and 30 minutes. Each workshop consisted of seven parts: introduction, sharing of experience, exercise of "thoughts now and then", exercise of finding benefits, exercise of visualization, retrospection of talents and hobbies.

Psychologists presented themselves in the introductory part, speaking about the goals of workshops and guaranteeing the participants secrecy of data. Sharing experiences, as a separate segment, meant that all the participants talked about their experiences relating to the disease and treatment. Then, in the segment of exercising "now and then", the participants had a task to write on two pages what thoughts they had after the initial diagnosis of cancer, and what they were thinking now. In the segment "exercise of finding benefits", the participants tried to find benefits of the situation, that is, to shift focus from indisputably great number of negative aspects of this situation on the possibly positive aspects. The aim of the "exercises of visualization" was to place participants into the context of cured persons, and therefore, they had to imagine a shape with a certainly positive valence instead of cancer (Sun, flower, star, heart…) or that there was no cancer at all in the organism. In the following segment "retrospection of talents and hobbies", the participants talked about their talents, skills, hobbies, and activities that were pleasant for them. The last part was discussion, when the participants asked questions. The questions related to the workshop, exercises, techniques of self-help, or all dilemmas that psychologists could give answers to. Also, the participants commented on the workshops and gave suggestions for their improvement.

Data about the participants were obtained during this study and all 7 segments of workshops, by recording all the participants' attitudes with the help of dictation machine. The moderator of workshops was a psychologist. The work in workshops corresponded to the work in focus groups.

Results

In the first two segments of workshops, we had less-structured contents that served to develop the relation of confidence and connection among the participants, through similar experiences. In the third segment, the participants compared their thoughts and emotional states at the moment when they found out about the diagnosis of cancer and their current thoughts and states. This exercise was focused on polarization, which appears in patients regarding emotions influenced by thinking about the situation. The most common answers were the initial fear contrary to the relief at the present moment, then worry versus acceptance, serenity versus hope, a constant struggle versus

Vežbe vizualizacije su imale za cilj da učesnici stave sebe u kontekst izlečene osobe, te da zamisle da je na mesto kancera neki oblik sa nesporno pozitivnom valencom (sunce, cvet, zvezda, srce…) ili pak da kancera uopšte nema u organizmu. Primećeno je da je ispitanicima bilo znatno lakše da kancera nema, nego da ga pretvore u objekat sa pozitivnom valencom.

U delu hobija i talenata učesnici su navodili aktivnosti koje su im važne, u kojima uživaju ili su zaboravili da rade, te da u ovoj situaciji rado bi se vratili nekim od njih. Navodili su: sportske aktivnosti (šetnje, treninge, neke sportove), crtanje, čitanje, manuelne aktivnosti (šivenje, pletenje, heklanje), kuvanje, uzgajanje cveća, kao i igranje sa unucima / sa decom.

U delu diskusije sa pacijentima dobili smo dobru povratnu informaciju. Učesnici su navodili da im je grupa podrške mnogo značila, zato što su mogli da podele zajednička iskustva, a i ona koja se razlikuju zbog različitih dijagnoza i ostalih ličnih specifičnosti. Time su shvatili da nisu sami, i da svako na svoj način prolazi kroz određene emocionalne procese. Međutim, kao zamerku navodili su činjenicu da je grupa mešovita, pa je njihova preporuka bila da odvojimo grupu po rodu i po vrsti kancera od kojeg se leče.

Diskusija

Cilj organizovanja ovakve grupne podrške pacijentima obolelim od kancera Odeljenja sa radioterapije bio je da se učesnici upoznaju sa novima mehanizmima prevladavanja psiholoških poteškoća, da se povežu između sebe i da razumiju da nisu jedini koji prolaze kroz poteškoće u prihvatanju bolesti, sam tok bolesti, emocionalne promene, kao i brojne druge promene u životnom funkcionisanju. Takođe, namera je bila da se učesnici u jednoj sigurnoj sredini osećaju slobodni da izraze svoje emocije, misli i nade, te da ih na taj način osnažimo da ne zadržavaju sve ono što bi bilo poželjno da se izrazi, a što je bio njihov dugogodišnji obrazac ponašanja. Ono što je bilo iznenađujuće je to što su muškarci bili otvoreni da iznose svoje emocionalne sadržaje, što nije baš u skladu sa kulturološkim obrascima Crne Gore. Pretpostavljamo da su ovakvi tipovi radionica doprineli u nekom delu promene, validirajući svako stanje kroz koje neko prolazi kao prihvatljivo i ljudsko.

Kod određenog broja učesnika primećena je polarizacija emocija, u smislu strah-rasterećenje i briga-prihvatanje, koje ukazuje da nakon dijagnostikovanja određeni broj učesnika ima automatske negativne reakcije, dok su bivajući u situaciji lečenja razvili strategije prevladavanja i prihvatanja što dovodi do adekvatnijih reakcija i boljeg kvaliteta života. Kod onih učesnika kod kojih nije uočena polarizacija, razlikujemo dve grupe. Kod jednih su se od početka pa do kraja javljale negativne reakcije i loša očekivanja, što sve ukazuje na lošije *coping* strategije i one kod kojih je od početka pa do sada prevladavanje teškoća uspešno.

Vežba benefita je jedan od segmenata radionice za koje smo imale najmanje očekivanja u startu, a pokazala je da veliki broj učesnika ima sposobnost promene fokusa sa neosporno negativnih aspekata situacije na postojanje i pozitivnih, u smislu samospoznaje, raščišćavanja odnosa, shvatanja da su važni sami sebi, da je bitna briga o sebi, razlikovanje važnih elemenata života od nevažnih i slično. Sa druge strane, učesnici su pokazali teškoću da u vežbi vizualizacije sam kancer pretvore u neki predmet sa pozitivnom valencom, a nisu imali teškoća da vizualizuju da je on nestao iz organizma, zbog pretpostavke da iako zamisle da je kancer predmet sa pozitivnom valencom, on je i dalje nepoželjan u organizmu jer je jaka asocijacija na njegovo loše značenje, a to smo i očekivale kao rezultat.

Kroz deo radionice gde je bilo isticanje hobija i talenata, hteli smo akcenat da stavimo na snage učesnika i njihove sposobnosti, da dok govore o posebnim talentima i hobijama probudimo motivaciju kod svakog od učesnika da se vrate svojim starim navikama i aktivnostima, koje su za njih funkcionalne, koje ih čine zadovoljnim i ispunjenim, a da se mogu tome vraćati i u teškim periodima tokom lečenja.

Sve što je bio sadržaj ovih radionica govori nam da organizovanje grupa podrške ima svoj smisao i svrhu i mnogobrojne benefite. Dobili smo više dobrih rezultata nego što smo u početku očekivali, što nam je pružilo profesionalnu i ličnu satisfakciju. Daljim individualnim praćenjem učesnika, uočili smo da su nastavili komunikaciju sa ostalim učesnicima i razvili međusobnu podršku. Ovaj serijal radionica je prekinut zbog epidemiološke situacije u našoj zemlji, te se nadamo da će u narednom periodu biti moguće organizovati naredni ciklus, gde bismo iskoristile sugestije učesnika u

passivity, and courage versus withdrawal. A small number of participants stated that there was no difference regarding the emotional state and thoughts between the moment of initial diagnosis and present moment.

In the exercise of finding benefits, good sides of the situation were the following: better caring for themselves, closeness with people, better insight into relations, the importance of preserving health, differentiating between important and unimportant, gratitude and self-realization. It happened rarely that they could not state the benefits.

The aim of visualization exercise was to place themselves into the context of cured people, to imagine a shape with indisputably positive valence instead of cancer (Sun, flower, star, heart…) or that there was no cancer in the organism. It was noted that it was a lot easier for the participants to imagine that there was no cancer than to transform it into an object with a positive valence.

In the segment of hobbies and talents, the participants listed activities that were important for them, that they enjoyed or that they forgot how to do, and they stated that they would be glad to return to one of these activities in this situation. They listed sports activities (walks, trainings, some sports), drawing, reading, manual activities (sewing, knitting, crocheting), cooking, growing flowers, playing with grandchildren/children.

In the segment related to discussion with patients, we got good feedback information. The participants claimed that this support group was very important because they could share similar experiences, as well as those that were different because of different diagnoses and other personal specificities. Thus, they realized that they were not alone and that all people passed through certain emotional processes in their own way. However, as an objection they stated the fact that it was a mixed group, and therefore, their recommendation was to separate the group according to gender and the type of cancer they had.

Discussion

The aim of organizing this form of group support for patients with cancer at the Department for Radiotherapy was to acquaint the participants with the new mechanisms of overcoming psychological difficulties, to connect them and to realize that they were not the only ones who passed through difficulties regarding the acceptance of disease, to understand the course of disease, emotional changes, as well as other changes in daily functioning. Also, the intention was to place the participants in safe surroundings, where they could feel free to express their emotions, thoughts and hopes, to strengthen them not to keep all that was desirable to be expressed, which had been their pattern of behavior for many years. It was surprising that males were open to express their emotional contents, which was not in accordance with cultural patterns of Montenegro. We assumed that such workshops contributed to, in some part, to this change, by validating each state that somebody went through as acceptable and human.

The polarization of emotions was noticed in some of the participants, regarding emotions fear-relief, worry-acceptance, which showed that certain participants had automatically negative reactions after the diagnosis, while during their treatment they developed the strategies of overcoming and accepting that led to more adequate reactions and a better quality of life. There were two groups of participants without negative polarization. In one group, negative reactions and bad expectations were present from the beginning till the end, which pointed to lousy coping strategies, and in another group, overcoming difficulties was successful from the beginning till the present moment.

The exercise of benefits is one of the segments for which we had the minimal expectations. However, many participants were able to change focus from indisputably negative aspects of the situation to positive aspects, that is, the self-realization, clearing up the relations, realizing that they are important to themselves, that caring for themselves is important, as well as making difference between important and unimportant things in life. On the other hand, the participants had difficulty transforming cancer into something with a positive valence in the exercise of visualization, but they did not have difficulty imagining that it disappeared from the organism because even if they imagined cancer as a thing with a positive valence, it was still undesirable in the organism because the association of its bad meaning was strong, and we expected this as a result.

delu organizovanja više manjih homogenih grupa umesto jedne veće heterogene, onda kada situacija bude zadovoljila te kriterijume, s obzirom na činjenicu da je često na Odeljenju za radioterapiju brojčano veća grupa ženskog roda.

Brojna istraživanja ukazuju da psihološki stres, pored niza drugih faktora, ima uticaj na razvoj malignih bolesti (7). Psihološki stres utiće na relevantne promene u neuronskoj aktivnosti i regulaciji gena u različitim delovima mozga. Takođe, stres može imati važan uticaj na imunološki sistem i na nastanak karcinoma. Neke studije ukazuju na značaj uticaja depresije, povezane sa neuroendokrinim stresom, na pogoršanje patogeneze karcinoma inhibicijom antitumorskih imunoloških odgovora. *In vitro*, *in vivo* i kliničke studije pokazuju da procesi povezani sa stresom mogu uticati na puteve povezane sa progresijom karcinoma, uključujući imunoregulaciju, angiogenezu i invaziju (8). Mnoge studije ukazuju da bračni status predstavlja vid važne socijalne podrške i povezan je sa manjim umiranjem osoba sa hroničnim bolestima (9). Uočeno je da se kod pacijenatavan bračne zajednice, u poređenju sa osobama u braku, kasnije postavlja dijagnoza (10), kao i da kod njih dolazi do bržeg napredovanja raka i metastaza (11). Neki autori navode da osobe sa lošijim brakom imaju sporiji oporavak nakon operacije (12). U Saudijskoj Arabiji, neudate osobe verovatnije će se javiti lekaru sa uznapredovalim kolorektalnim kancerom i imati veći rizik od smrtnog ishoda nego pacijenti u braku (13). U jednom radu autori navode da je bračni status prediktor boljeg preživljavanja raka nego hemoterapija (14).

Sva ova istraživanja potvđuju rezultate našeg istraživanja o neophodnosti organizovanja grupa podrške osobama sa malignim bolestima u cilju njihovog prihvatanja bolesti i lečenja, eliminisanja stresa, kao i za unapređenja kvaliteta njihovog života.

Zaključak

Organizovanje grupa podrške osobama sa malignim bolestima kroz radionice ima svoj smisao i svrhu i mnogobrojne benefite. Neophodno je dalje raditi na organizovanju ovakavih radionica i za pacijente koji se leče ambulantnim putem, ali i unaprediti radionice uvođenjem novih segmenata u njihov sadržaj. Organizovanjem radionica za mnogo homogenije grupe, kao na primer radionice posebno za žene i muškarce, kao i u odnosu na oboljenje koje osobe imaju, može doprineti ostvarivanju većeg stepena međugrupne podrške.

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In the segment of workshop relating to hobbies and talents, we wanted to place an accent on participants' strengths and abilities, and to instigate motivation in all the participants to return to their old habits and activities that were functional for them, that made them satisfied and fulfilled, and which they could go back to even in hard periods of treatment.

The contents of these workshops speak about the fact that organizing support groups has its meaning, purpose and numerous benefits. We gained more good results than we had expected in the beginning, which gave us professional and personal satisfaction. Further individual observation of participants showed that they continued to communicate with other participants and they supported each other. This series of workshops was stopped because of the epidemiological situation in our country, and we hope that we will be able to organize the next cycle in the following period, and we would use the participants' suggestions about organizing smaller homogenous groups instead of one larger and heterogeneous group, when the situation has met the criteria considering the fact that a group of females is frequently larger at the Department for Radiotherapy.

Numerous studies have pointed to the fact that psychological stress, in addition to other factors, has influence on the development of malignant diseases (7). Psychological stress influences the relevant changes in the neural activity and regulation of genes in different parts of the brain. Also, stress can have an important influence on immunological system and occurrence of cancer. Some studies have pointed to the influence of depression connected with the neuroendocrine stress on worsening of cancer pathogenesis which happens due to the inhibition of antitumor immunological response. In vitro and in vivo studies have showed that processes, which are associated with stress, may have influence on the ways connected with the progression of cancer, including immunoregulation, angiogenesis and invasion (8). Numerous studies have indicated that marital status represents an important form of social support and it is associated with lower dying of people with chronic diseases (9). It has been noticed that in patients who are not married in comparison to married patients, the diagnosis is established later (10), as well as that in these patients cancer and metastases progress more quickly (11). Some authors state that patients, who do not live in a good marriage, recover more slowly after the operation (12). In Saudi Arabia, unmarried persons are likely to visit their doctors in advanced stages of colorectal cancer and they have a higher risk of deathly outcome than married patients (13). In one study, authors state that marital status is a predictor of better survival than chemotherapy (14).

All these studies confirm the results of our research about the necessity of organizing support groups for patients with malignant diseases aimed at their accepting the disease and treatment, eliminating the stress, as well as at improving the quality of life.

Conclusion

Organizing support groups for people with malignant diseases with the help of workshops has its meaning, purpose and numerous benefits. It is necessary to organize such workshops for patients who are treated on an outpatient basis, as well as to improve the workshops by introducing new segments in their contents. Organizing workshops for more homogenous groups, for example workshops for males and females, and according to the disease that they have, may contribute to achieve a higher level of inter-group support.

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ZAVISNOST OD „PAMETNIH" TELEFONA

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SAŽETAK

Broj korisnika pametnih telefona (smartfona, engl. *smartphone*) širom sveta danas premašuje tri milijarde i predviđa se dalji rast od nekoliko stotina miliona u narednih nekoliko godina. Razvoj multifunkcionalnih pametnih telefona i njihova primena promenili su način komuniciranja i informisanja, ali i doveli do zabrinutosti zbog njihove prekomerne upotrebe i zavisnosti. Poslednjih godina, istraživanja zavisnosti od pametnih telefona su u porastu. Paralele između prekomerne upotrebe pametnih telefona i bihevioralne zavisnosti česte su u israživanjima. Prema mnogim autorima „zavisnost od pametnih telefona" može se smatrati bihevioralnom zavisnošću. Postoje dokazi za postojanje strukturnih i funkcionalnih promena u mozgu, karakterističnim za bihevioralne zavisnosti, kod osoba koje ispunjavaju psihometrijske kriterijume za „zavisnost od pametnih telefona". Neki autori čak predlažu kriterijume za dijagnozu zavisnosti od pametnih telefona. S druge strane, neki autori smatraju da korišćenje termina „zavisnost" može pogrešno predstaviti težinu poremećaja, te stoga predlažu korišćenje termina „problematična upotreba pametnih telefona". Zbog rastuće zabrinutosti oko prekomernog korišćenja pametnih telefona, dosta se radi na prepoznavanju i proceni problematične upotrebe pametnih telefona, uglavnom kroz razvoj i primenu skala za procenu ponašanja. Ove skale su posebno razvijene i validirane za identifikovanje problematične upotrebe pametnih telefona ili za dijagnostikovanje osoba sa zavisnošću od pametnih telefona, prekomernom upotrebom, preteranom vezanošću za telefon isl. Međutim, i pored toga što je većina ovih skala osmišljena sa namerom da se u budućnosti koriste za kliničke svrhe, problematična upotreba pametnih telefona kao vrsta zavisnosti ne nalazi se u Međunarodnoj klasifikaciji bolesti, te se skale još uvek koriste samo u istraživačke svrhe. Upotreba termina „problematična upotreba pametnih telefona" i „zavisnost od pametnih telefona", različiti metodološki pristupi koji se koriste u izučavanju, kao što je primena različith skala i nedostatak standardizovanih dijagnostičkih kriterijuma, otežavaju definisanje „zavisnosti od pametnih telefona". Sve to ide u prilog činjenici da je „zavisnost od pametnih telefona" kompleksan fenomen koji zahteva dodatna istraživanja.

Ključne reči: zavisnost, pametni telefoni, problematična upotreba telefona

Uvod

Broj korisnika pametnih telefona (smartfona, engl. *smartphone*) širom sveta danas premašuje tri milijarde i predviđa se dalji rast od nekoliko stotina miliona u narednih nekoliko godina. Kina, Indija i Sjedinjene Američke Države su zemlje sa najvećim brojem korisnika smartfona, sa ukupno 1,46 milijardi korisnika (1). Mobilni telefoni nisu više namenjeni samo komunikaciji između dve osobe. Najnovije generacije mobilnih telefona (pametni telefoni, smartfoni) imaju mnoge funkcije kao i računari, ekran osetljiv na dodir (engl. *touchscreen*), pristup Internetu, i operativni sistem sposoban za pokretanje različitih aplikacija (2). Omogućavaju ljudima širok spektar *online* aktivnosti, kao što su surfovanje internetom, email, video igrice, kockanje, pristup društvenim mrežama (*Facebook, Twitter, Instagram*…). Razvoj multifunkcionalnih pametnih telefona i njihova primena promenili su način komuniciranja i informisanja, ali i doveli do zabrinutosti zbog njihove prekomerne upotrebe i zavisnosti. Nije samo rasprostranjena upotreba tehnologije ono što izaziva zabrinutost, već potencijalne negativne posledice povezane sa korišćenjem pametnih telefona, zbog čega istraživači naglašavaju važnost istraživanja ovog ponašanja. Bez obzira na to što „zavisnost od pametnih telefona" još uvek nije prepoznata u psihijatrijskim vodičima, mnoge studije beleže visoku

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SMARTPHONE ADDICTION

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SUMMARY

The number of smartphone users worldwide exceeds three billion today and further growth of several hundred million is projected over the next few years. The development of multifunctional smartphones and their use have changed the way of communication and information, but also led to concerns about their excessive use and dependence. In recent years, research on smartphone addiction has been on the rise. Parallels between excessive smartphone use and behavioral addiction are common in research. According to many authors, "smartphone addiction" can be considered a behavioral addiction. There is evidence for structural and functional changes in the brain, characteristic of behavioral addictions, in people who meet the psychometric criteria for "smartphone addiction." Some authors even suggest criteria for diagnosing smartphone addiction. On the other hand, some authors believe that the use of the term "addiction" can misrepresent the severity of the disorder, and therefore suggest the use of the term "problematic smartphone use". Due to growing concerns about the excessive use of smartphones, much is being done to identify and assess problematic smartphone use, mainly through the development and application of behavioral assessment scales. These scales are specially developed and validated to identify problematic smartphone use or to diagnose people with smartphone addiction, overuse, excessive phone attachment, etc. However, despite the fact that most of these scales are designed to be used for clinical purposes in the future, the problematic use of smartphones as a type of addiction is not in the International Classification of Diseases and these scales are still used only for research purposes. The use of the terms " problematic smartphone use " and "smartphone addiction", different methodological approaches used in the study, such as the application of different scales and the lack of standardized diagnostic criteria, make it difficult to define "smartphone addiction". All this supports the fact that "smartphone addiction" is a complex phenomenon that requires additional research.

Key words: addiction, smartphone, problemmatic samrtphone use

Introduction

The number of smartphone users worldwide surpasses three billion today and is forecast to further grow by several hundred million in the next few years. China, India and the United States of America are the countries with the highest number of smartphone users with 1.46 million users (1). Mobile phones are not only designed for the communication between two persons. The latest generations of smartphones have some of the functions of a computer, such as a touch screen, the access to the Internet, and the operating system that can run different applications (2). They cover a wide range of online activities, such as surfing the Net, e-mail, video games, gambling, the access to social networks (Facebook, Twitter, Instagram…). The development of multifunctional smartphones and their use have changed the way of communication and information, and also led to concerns about their excessive use and dependence. The excessive use of technology is not the only issue that causes concerns, but potential negative consequences associated with the overuse of smartphones, and therefore, researchers emphasize the importance of investigating this behavior. Although smartphone addiction has not been recognized in psychiatric manuals yet, many studies have registered a high prevalence of smartphone addiction, from 16.9% in Switzerland to 38.5% in China (3).

prevalenciju zavisnosti, od 16,9% u Švajcarskoj, do čak 38,5% u Kini (3).

Problem u definisanju „zavisnosti od pametnih telefona"

Američko udruženje psihijatara (APA) definiše zavisnost i zloupotrebu supstanci, u širem smislu, kao složeno stanje koje se manifestuje nekontrolisanom upotrebom psihoaktivnih supstanci uprkos štetnim posledicama (4). Prema ovoj definiciji, da bi osoba bila „zavisnik", neophodno je da konzumira određenu psihoaktivnu supstancu od koje je zavisna. Međutim, Dijagnostički i statistički priručnik za mentalne bolest Američkog udruženja psihijatara (DSM-5) (5) i Međunarodna klasifikacija bolesti (MKB-11) Svetske zdravstvene organizacije (6) prepoznaju kategorije bihevioralne zavisnosti. Bihevioralne zavisnosti su nesupstancijalne zavisnosti, ponavljano ponašanje koje ima negativne posledice (7). Prema najnovijoj kategorizaciji bolesti zavisnosti u DSM-5, kockanje je prepoznato kao nesupstancijalni poremećaj zavisnosti kao zaseban klinički entitet u kategoriji „*Substance-Related and Addictive Disorders*" (5). Pored toga, i zavisnost od igranja igrica na internetu (engl. i*nternet gaming disorder*) uključena je u DSM-5 kao stanje koje je potrebno dodatno istražiti (engl. *conditions for further study*) (5). I kockanje, i zavisnost od igranja igrica na internetu, zajedno su grupisani u MKB-11, što sugeriše da su bihevioralne zavisnosti slične poremećajima upotrebe supstanci. Međutim, ni DSM-5 ni MKB-11 još uvek ne pominju zavisnost od mobilnih i pametnih telefona. Ipak, poslednjih godina, istraživanja zavisnosti od pametnih telefona su u porastu (8–15) i čini se da postoji tendencija da se navike u korišćenju popularne tehnologije okarakterišu kao zavisnost.

Prema MKB-11, glavne odlike zavisnosti od psihoaktivnih supstanci su snažan unutrašnji nagon za korišćenjem supstance, uz odsustvo samokontrole korišćenja, i da korišćenje supstance ima prioritet u odnosu na druge aktivnosti uprkos štetnim posledicama. Za bihevioralne zavisnosti predlažu se dve komponente: značajan poremećaj funkcionisanja ili distres kao posledica ponašanja i trajanje tokom vremena (7). Stoga, iz više različitih izvora može se izvući sumarna teorijska definicija zavisnosti, sa dve ključne komponente: a) (ozbiljne) negativne posledice ili oštećenje i b) psihološka (žudnja, preokupiranost i gubitak kontrole) i fiziološka (tolerancija i apstinencijalni sindrom) zavisnost koji navode osobu da nastavi sa takvim ponašanjem (18).

Griffiths definiše zavisnosti od tehnologije kao nehemijske (bihevioralne) zavisnosti koje podrazumevaju interakciju ljudi i mašina (16). Stav ovog autora je da su tehnološke zavisnosti podskup bihevioralne zavisnosti i da su komponente bihevioralne zavisnosti ključne komponente tehnološke zavisnosti (preokupiranost, poremećaj raspoloženja, tolerancija, apstinencijalni sindrom, konflikt i relaps) (16). Preokupiranost podrazumeva da određena aktivnost postane najvažnija aktivnost u životu osobe i okupira njeno razmišljanje. Poremećaj raspoloženja se odnosi na to da konzumiranje psihoaktivne supstance, ili obavljanje određenje aktivnosti, može imati različite efekte na raspoloženje. Tolerancija podrazumeva da su potrebne sve veće količine supstance ili aktivnosti da bi se postigli raniji efekti. Neprijatna osećanja ili fizički efekti do kojih dolazi kada se prekine sa određenom aktivnošću predstavljaju apstinencijalni sindrom. Konflikt se odnosi na konflikt između zavisnika i njegove okoline – interpersonalni, i unutar same individue – intrapsihički konflikt. Relaps znači vraćanje ranijim obrascima ponašanja nakon duže apstinencije. Prema *Griffits*-u zavisnost je biopsihosocijalni proces, i nije ograničena samo na konzumiranje droga, odnosno zavisnička ponašanja imaju mnogo sličnosti, što može ukazati na njihovu zajedničku etiologiju. Te zajedničke osobine mogu imati uticaj ne samo na tretman zavisničkih ponašanja, već i na to kako ih šira javnost percipira (17).

Paralele između prekomerne upotrebe pametnih telefona i bihevioralne zavisnosti česte su u israživanjima (8,9,19). Pojam „zavisnost od pametnih telefona" je uveden kako bi opisao prekomerno i psihosocijano disfunkcionalno korišćenje pametnih telefona koje podseća na bihevioralne zavisnosti (8). *Lin* i saradnici, čak idu toliko daleko da predlažu dijagnostičke kriterijume za postavljanje dijagnoze „zavisnosti od pametnih telefona" (19). Dijagnostički kriterijumi podeljeni su u tri dela: prvi deo (kriterijumi A) sastoji se od simptoma zavisnosti od pametnih telefona (nedostatak samokontrole po pitanju korišćenja, apstinencijalni sindrom, korišćenje telefona duže nego što su nameravali, i korišćenje uprkos negativnim posledicama), drugi deo (kriterijumi B) opisuje funkcionalna oštećenja koja nastaju kao posledica korišćenja pametnih

The problem of defining 'smartphone addiction'

The American Psychiatric Association (APA) defines addiction and substance abuse, in a broader sense, as a complex condition in which there is an uncontrolled use of psychoactive substances despite harmful consequences (4). According to this definition, it is necessary that a person uses certain psychoactive substances in order to be an "addict". However, the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association (DSM-5) (5) and the International Classification of Diseases (ICD-11) of the World Health Organization (6) recognize the categories of behavioral addiction. Behavioral addictions are non-substance addictions, the repetitive behavior that has negative consequences (7). The reclassification of addictive disorders in DSM-5 recognizes gambling, which has been studied most and which is similar to psychoactive substance dependence, as a non-substance disorder and it was included in the new DSM-5 classification as a separate clinical entity in the category "Substance-Related and Addictive Disorders" (5). In addition, internet gaming disorder was also included in the DSM-5 as a condition for further study (5). Both gambling and internet gaming disorders were included in the ICD-11, which suggests that behavioral addictions are similar to substance use disorders. However, cell phone and smartphone addiction have not been mentioned in the DSM-5 and ICD-11 yet. Although research on smartphone addiction has been on the rise in recent years (8-15), it seems that habits of using popular technology tend to be characterized as an addiction.

According to the ICD-11 draft, the main characteristics of psychoactive substance dependence are the strong internal drive to use the substance coupled with the lack of self-control, and increasing priority is given to using the substance than doing other activities despite harmful consequences. Two components are proposed for behavioral addiction: a significant functional impairment or distress as a consequence of the behavior and persistence over time (7). Therefore, a brief theoretical definition of dependence can be summarized from different sources, by two key components: a) (severe) negative consequences or impairment and b) psychological (craving, salience and loss of control) and physiological dependence (tolerance and withdrawal) that leads one to carry on the behavior (18).

Griffiths defines technological addictions as non-chemical (behavioral) addictions which involve the human-machine interaction (16). This author states that technological addictions are a subgroup of behavioral addictions and that components of behavioral addiction are key components of technological addiction (salience, mood modification, tolerance, withdrawal, conflict and relapse) (16). Salience is when the activity in question becomes the most important activity to the user and dominates their thinking. Mood modification means that the psychoactive substance use or certain activities may have different effects on the mood. Tolerance means increasing amounts of psychoactive substances or activities to achieve the former effects. Unpleasant feelings or physical effects, which occur when the particular activity is discontinued, represent withdrawal or abstinence syndrome. Conflict refers to the conflict between the addict and those around them – interpersonal, and from within the individual themselves – intrapsychic. Relapse is returning to previous patterns of behavior after long abstinence. According to Griffiths, addiction is a biopsychosocial process, and it is not limited only to the ingestion of drugs, that is, addictive behaviors have a lot of commonalities, which may point to their common etiology. These commonalities may have implications not only for the treatment of addictive behaviors, but also for how the general public perceives such behaviors (17).

Parallels between the excessive use of smartphones and behavioral addiction are common in studies (8,9,19). The term "smartphone addiction" was introduced to describe the excessive and psychosocial dysfunctional use of smartphones which reminds of behavioral addictions (8). Lin and associates even suggest diagnostic criteria for diagnosing smartphone addiction (19). Diagnostic criteria are divided into three groups: 1) the first criteria (A) consist of symptom criteria regarding smartphone addiction (lack of self-control in terms of using, abstinence syndrome, using the phone longer than they intended, and using the phone despite negative consequences); 2) the second group of criteria

telefona (fizički ili psihološki problem, korišćenje telefona u rizičnim situacijama, uticaj na socijalne odnose, uspeh u školi ili na poslu), i treći deo (kriterijumi C) su kriterijumi isključenja (kako bi se isključile manične epizode ili opsesivno-kompulzivni poremećaj). Prema njihovim rezultatima karakteristike zavisnosti od pametnih telefona se u velikoj meri preklapaju sa zavisnošću od psihoaktivnih supstanci i bihevioralnim zavisnostima. Jedinstvenost pametnih telefona, pre svega pristup internetu i raznim aplikacijama, doprinose raširenom zavisničkom ponašanju. Štaviše, studija *Horvath*-a i saradnika (20) pruža dokaze za različite strukturne i funkcionalne promene, odnosno neuronske mehanizmime, specifične za bihevioralne zavisnosti, kod osoba koje zadovoljavaju psihometrijske kriterijume za zavisnost od pametnih telefona. S obzirom na njihovu široku upotrebu, dovodi se u pitanje njihova neškodljivost, pogotovo kod pojedinaca koji su pod povećanim rizikom da razviju zavisničko ponašanje.

S druge strane, *Carbonell* i *Panova* (18) smatraju da su problemi povezani sa konceptualizacijom i prihvatanjem tehnoloških zavisnosti u velikoj meri vezani za terminologiju. „Zavisnost od pametnih telefona" svakako nije ozbiljna i teška, i sa takvim zdravstvenim posledicama kao što su to zavisnosti od duvana ili heroina. Međutim, ne postoji drugi prihvaćen termin za ponašanje koje se ispoljava nedostatkom samokontrole, vezanošću, prekomernom upotrebom i negativnim posledicama. Stoga, u nedostatku boljeg termina, „zavisnost" je postala krovni termin za takva ponašanja. Autori smatraju da korišćenje termina „zavisnost" može pogrešno predstaviti težinu poremećaja te stoga predlažu korišćenje termina „problematična upotreba pametnih telefona".

Billieux je definisao problematičnu upotrebu mobilnih telefona kao „nemogućnost da se kontroliše korišćenje mobilnog telefona, što na kraju dovodi do negativnih posledica u svakodnevnom životu" (21). Brojne studije koje ukazuju da je upotreba pametnih telefona povezana sa različitim aspektima disfunkcije, podržavaju koncept problematične upotrebe pametnih telefona zavisno od negativnih posledica upotrebe. Studije su pokazale značajnu povezanost socijalnih, interpersonalnih, i akademskih disfunkcija, kao i mentalnog zdravlja, što pokazuje da korišćenje pametnih telefona može imati negativne posledice za određene osobe (21).

Skale za merenje „problematične upotrebe pametnih telefona" i „zavisnosti od pametnih telefona"

Zbog rastuće zabrinutosti oko prekomernog korišćenja pametnih telefona, dosta se radi na prepoznavanju i proceni problematične upotrebe pametnih telefona, uglavnom kroz razvoj i primenu skala za procenu ponašanja. *Haris* i saradnici (22) su u svom preglednom radu obuhvatili čak 78 skala. Ove skale su posebno razvijene i validirane za identifikovanje problematične upotrebe pametnih telefona ili za dijagnostikovanje osoba sa zavisnošću od pametnih telefona, prekomernom upotrebom, preteranom vezanošću za telefon i sl. Iako se konstrukt koji ove skale mere može razlikovati, mnoge su slične u svojoj teorijskoj osnovi, čak i u stavkama koje sadrže. Najčešće su DSM kriterijumi za zavisnost od psihoaktivnih supstanci korišćeni kako bi se kreirale stavke u skalama, da bi se procenila „zavisnost". Kako su se mobilni telefoni razvijali u pametne telefone, termini mobilni telefon i pametni telefon su se često, u studijama, koristili sa istim značenjem. Međutim, s obzirom da pametni telefoni imaju znatno više komponenata i funkcija nego mobilni telefoni, skale su često ažurirane i prilagođavane specifičnostima pametnih telefona. Mi ćemo se osvrnuti na nekoliko skala koje su najčešće korišćene za procenu problematične upotrebe ili „zavisnosti" od pametnih telefona.

Skala zavisnosti od pametnih telefona (Smartphone addiction scale – SAS) i Skala zavisnosti od pametnih telefona – Skraćena verzija (Smartphone addiction scale – Short version– SAS-SV)

Kwon i saradnici (8) su razvili upitnik Skalu zavisnosti od pametnih telefona (*Smartphone addiction* scale–SAS) sa 6 faktora odnosno 33 stavke Likertovog tipa na skali od 1 do 6 (1 – u potpunosti se ne slažem, do 6– u potpunosti se slažem). Šest faktora su: remećenje svakodnevnog života, pozitivna anticipacija, apstinencijalni sindrom, orijentisanost na sajber odnose, prekomerna upotreba telefona i tolerancija. Interna konzistentnost (*Cronbach's alpha*) upitnika bila je 0,967. Autori su, zatim, na bazi postojeće skale, razvili skraćenu verziju upitnika (SAS-SV) kako bi lakše i jednostavnije, za kraće vreme, procenili zavisnost od pametnih telefona. SAS-SV upitnik se sastoji od 10 pitanja Likertovog tipa (na skali od 1 do 6). Ukupan skor može biti u opsegu od 10 (minimum) do 60

(B) describes functional impairment criteria that appear as a consequence of smartphone use (physical or psychological problem, using the phone in risky situations, impact on social relations, success at school or at work); and 3) the third group of criteria (C) includes exclusion criteria (in order to exclude manic episodes or obsessive-compulsive disorder). According to their results, characteristics of smartphone addiction overlap, to a great extent, with psychoactive substances dependence and behavioral addictions. The uniqueness of smartphones, first of all, the access to the internet and to various applications, contribute to a wider addictive behavior. Furthermore, the study of Horvath and associates (20) provides evidence for distinct structural and functional changes, or neural mechanisms, specific for behavioral addictions in persons who meet the psychometric criteria for smartphone addiction. Given their widespread use, the study questions the harmlessness of smart phones, especially in individuals that are at increased risk for developing addictive behavior.

On the other hand, Carbonell and Panova (18) claim that the problems associated with the conceptualization and acceptance of technological addictions may be, to a great degree, an issue related to the terminology. "Smartphone addiction" is certainly not that severe and difficult, and with such health consequences in comparison to tobacco and heroin addiction. However, there is no other accepted term for a behavior that manifests as a lack of self-control, attachment, overuse and negative consequences. Therefore, for lack of a better word "addiction" has become an accepted umbrella term. Some authors think that the use of the term "addiction" may misrepresent the severity of the disorder and therefore, they suggest the use of the term "problematic smartphone use".

Billieux defined the problematic use of mobile phones as "the inability to regulate one's use of the mobile phone, which eventually involves negative consequences in daily life" (21). Numerous studies, which suggest that smartphone use is associated with different aspects of dysfunction, support the concept of problematic smartphone use depending on the negative consequences of that use. The studies have shown the significant connectedness between social, interpersonal, academic dysfunctions, as well as mental health, which points to the fact that smartphone use can have negative consequences for some persons (21).

Scales for the measurement of "problematic smartphone use" and "smartphone addiction"

Due to growing concerns about the excessive use of smartphones, much is being done to identify and assess problematic smartphone use, mainly through the development and application of behavioral assessment scales. Haris and associates (22) included even 78 scales in their review article. These scales were specially developed and validated to identify smartphone use or to diagnose people with smartphone addiction, overuse, excessive phone attachment, etc. Although the construct, which is measured by these scales, may be different, many of them are similar in their theoretical base, even regarding the items that they include. DSM criteria for psychoactive substance dependence were most frequently used to create items in these scales, in order to assess "addiction". As mobile phones developed into smartphones, the terms mobile phone and smartphone were often used in the studies with the same meaning. However, considering the fact that smartphones have a lot more components and functions than mobile phones, the scales are frequently updated and adapted to the specificities of smartphones. We will deal with a few scales that are most commonly used for the assessment of problematic smartphone use or smartphone "addiction".

Smartphone addiction scale (SAS) and Smartphone addiction scale – short version (SAS-SV)

Kwon et al. (8) have developed the Smartphone addiction scale (SAS) with 6 factors, that is, 33 items on a 6-point Likert type scale (1 – strongly disagree to 6 – strongly agree). The six factors are: daily-life disturbance, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse and tolerance. The internal consistency (Cronbach's alpha) of this questionnaire was 0.967. The authors then, on the basis of the existing scale, have developed the short version of the questionnaire (SAS-SV), in order to assess smartphone addiction more easily and in shorter time. The SAS-SV

(maksimum), gde veći skor ukazuje na veći stepen zavisnosti od pametnih telefona (*Cronbach's alpha* 0,911). Kao granična (*cut-off*) vrednost skora za muškarce predložena je vrednost od 31 (senzitivnost 0,867; specifičnost 0,893), dok je za žene 33 (senzitivnost 0,875; specifičnost 0,886). SAS-SV je preveden i validiran na nekoliko jezika i široko se koristi kao instrument za skrining zavisnosti od pametnih telefona (10, 13, 14, 23, 24).

Upitnik zavisnosti od pametnih telefona (Smartphone Addiction Inventory – SPAI) i Upitnik zavisnosti od pametnih telefona – Skraćena verzija (Smartphone Addiction Inventory –Short Form SPAI-SF)

SPAI je upitnik od 26 pitanja koji je namenjen proceni zavisnosti od pametnih telefona (25). To je izmenjena verzija kineske Skale za procenu zavisnosti od interneta (*Chinese Internet Addiction Scale*) (26). Pet od 26 stavki originalne skale revidirano je zbog specifičnosti korišćenja pametnih telefona. Ispitanici ocenjuju stavke na Likertovoj skali od 1 (u potpunosti se ne slažem) do 4 (u potpunosti se slažem). Ukupan skor SPAI može biti od 26 do 104. SPAI ima dobru internu konzistentnost (*Cronbach's alpha* 0,94) i test-retest pouzdanost četiri subskale je od 0,80 do 0,91. *Lin* i saradnici (9) su, zatim, revidirali SPAI upitnik, uz pomoć eksperata za zavisnost od interneta i pametnih telefona, psihijatara i psihologa, i razvili skraćenu verziju upitnika SPAI-SF. SPAI-SF sastoji se od 10 stavki, na skali od 1 do 4. Autori preedlažu *cut-off* vrednost od 24/25 za zavisnost od pametnih telefona. I SPAI sa 26 stavki i SPAI-SF sadrže 4 konstrukta biheviorlne zavisnosti i zavisnosti od pametnih telefona (kompulsivno ponašanje, poremećaj funkcionisanja, apstinencijalni sindrom i tolerancija). Granična vrednost koju su odredili psihijatri može se koristiti za skrining zavisnosti i epidemiološka istraživanja.

Skala upotrebe mobilnih telefona (Mobile Phone Problem Use Scale – MPPUS -27) i skraćena verzija (MPPUS-10)

Bianchi i *Philips* su uveli skalu problematične upotrebe mobilnih telefona MPPUS-27 (27) koja obuhvata različite aspekte zavisnosti, prevashodno toleranciju, beg od drugih problema, apstinencijalni sindrom, žudnjiu i negativne posledice na život. Sastoji se od 27 stavki, Likertovog tipa, na koje se odgovara na skali od 1 (u potpunosti netačno) do 10 (u potpunosti tačno), pa ukupan skor može imati vrednost od 27 do 270 bodova. MPPUS-27 skala je često korišćena u istraživanjima o problematičnoj upotrebi mobilnih telefona (28, 29). Skala ima odličnu internu konzistentnost (*Cronbach's alpha* > 0,94), ali je prilično dugačka i neka pitanja su suvišna, pa je iz tog razloga napravljena skraćena verzija ove skale. Napravljena je MPPUS-10 skala (11), koja ima 4 faktora koja su u vezi sa simptomima zavisnosti (gubitak kontrole, apstinencijalni sindrom, negativne posledice na život i žudnja) i peti faktor, koji odražava socijalnu komponentu upotrebe mobilnih telefona (zavisnost od vršnjaka). Skraćena verzija MPPUS-10 u velikoj meri odražava originalnu MPPUS-27 skalu pa se, zbog lakše i jednostavnije primene, preporučuje njena primena u istraživanjima. Pogodna je za istrživanja na adolescentima.

Upitnik za problematičnu upotrebu mobilnih telefona (Problematic Mobile Phone Use Questionnaire – PMPUQ) i ažurirana verzija (Problematic Mobile Phone Use Questionnaire - Revised – PMPU-Q-R)

Billieux i saradnici (30) su, još 2008. godine, osmislili PMPUQ kako bi procenili korišćenje i potencijalno problematično korišćenje mobilnih telefona. Prema autorima, problematična upotreba mobilnih telefona je heterogeni i višedimenzionalni konstrukt koji uključuje potencijalne negativne efekte upotrebe mobilnih telefona. PMPUQ ima 30 pitanja i meri četiri različite dimenzije problematične upotrebe mobilnih telefona (zabranjena upotreba, opasna upotreba, zavisnost, finansijski problemi zbog korišćenja). Na osnovu njihovog modela, svaki način prekomernog korišćenja mobilnih telefona (npr. ekstraverzija, treženje potvrde, imulsivnost) zavisi od specifičnih psihosocijalnih faktora i individualnih razlika. *Kuss* i saradnici (31) su napravili ažuriranu verziju upitnika (*Problematic Mobile Phone Use Questionnaire - Revised* – PMPU-Q-R) koja ima 15 pitanja. Ažurirana verzija ima tri faktora (opasna upotreba, zabranjena upotreba i zavisnost) i prilagođena je korišćenju pametnih telefona. Četvrti faktor, koji se odnosio na finansijske probleme zbog korišćenja telefona, uklonjen je zbog razvoja pametnih telefona (pametni telefoni su dosta jeftiniji u poređenju sa vremenom kad su prvi put uvedeni). *Lopez-Fernandez* i sardanici (32) su ispitali psihometrijska svojstva 8 verzija PMPQ-SV na različitim jezicima (Nemački, Francuski, Engleski, Finski, Španski, Italijanski, Pol-

questionnaire consists of 10 questions on a 6-point Likert type scale. The total score may range from 10 (minimum) to 60 (maximum), where higher scores point to the higher degree of smartphone addiction (Cronbach's alpha 0.911). The value 31 (sensitivity 0.867; specificity 0.893) is suggested as the cut-off value for men, while for women this value is 33 (sensitivity 0.875; specificity 0.886). The SAS-SV has been translated and validated in a few languages and it is widely used as an instrument for smartphone addiction screening (10,13,14,23,24).

Smartphone Addiction Inventory (SPAI) and Smartphone Addiction Inventory – Short Form (SPAI-SF)

The SPAI is the inventory which consists of 26 questions and which is intended for the assessment of smartphone addiction (25). It is a modified version of the Chinese Internet Addiction Scale (26). Five of 26 items from the original scale were modified due to the specificity of smartphone use. The examinees evaluate items on a 4-point Likert type scale from 1 (strongly disagree) to 4 (strongly agree). The total score of the SAPI may range from 26 to 104. The SPAI has a good internal consistency (Cronbach's alpha 0.94), while the test-retest validity of four subscales ranges from 0.80 to 0.9. Lin and associates (9) then revised the SPAI with the help of experts for Internet and smartphone addiction, psychiatrists, psychologists and they developed a short version of the questionnaire SPAI-SF. The SPAI-SF consists of 10 items, on a scale from 1 to 4. The authors suggest the cut-off value of 24/25 for the smartphone addiction. Both the SPAI with 26 items and the SPAI-SF contain 4 constructs of behavioral addiction and smartphone addiction (compulsive behavior, functional disorder, withdrawal and tolerance). The cut-off value determined by psychiatrists can be used for the screening of addiction and epidemiological research.

Mobile Phone Problem Use Scale – MPPUS-27 and short version (MPPUS-10)

Bianchi and Philips have introduced the mobile phone problem use scale (MPPUS-27) (27) which addresses different aspects of addiction, primarily tolerance, escape from other problems, withdrawal, craving and negative life consequences. It consists of 27 items that have to be answered on a 10-point Likert type scale ranging from 1 ("not true at all") to 10 ("extremely true"), resulting in a final sum score that may range from 27 to 270 points. The MPPUS-27 is commonly used in research on the problematic mobile phone use (28,29). The scale has an excellent internal consistency (Cronbach's alpha > 0.94), but it is quite long and some questions are superfluous, and therefore, the shortened version of this scale was made. The MPPUS-10 (11) has been created and it has 4 factors that are related to the symptoms of addiction (loss of control, withdrawal, negative life consequences and craving) and the fifth factor that reflects the social component of mobile phone use (dependence on peers). The short version of MPPUS-10 reflects, to a great extent, the original version of MPPUS-27 scale, and due to its easier application it is recommended in research. It is useful for the research on adolescents.

Problematic Mobile Phone Use Questionnaire – PMPUQ and the updated version (Problematic Mobile Phone Use Questionnaire – Revised – PMPU-Q-R)

Billieux et al. (30) developed the PMPUQ in 2008 in order to evaluate the actual use and potential problematic use of mobile phones. According to the authors, the problematic mobile phone use is a heterogeneous and multidimensional construct that involves the potential negative effects of mobile phone use. The PMPUQ has 30 questions and it measures four different dimensions of problematic mobile phone use (prohibited use, dangerous use, addiction, financial problems). According to their model, each type of excessive mobile phone use (extraversion pathway, reassurance-seeking pathway, impulsive pathway) depends on specific psychosocial factors and individual differences. Kuss and associates (31) have made the updated version of the questionnaire (Mobile Phone Use Questionnaire – Revised, PMPU-Q-R) that has 15 questions. The revised version has three factors (dangerous use, prohibited use, and dependent use) and it is adapted to smartphone use. The fourth factor, which related to financial problems arising from mobile phone use, was removed due to the development of smartphones (smartphones are a lot cheaper in comparison to the time when

jski i Mađarski). Struktura PMPUQ-SV je potvrđena za skoro sve testirane jezike.

Većina skala su po tipu samoprocene, pa prema tome ne mogu objektivno i pouzdano meriti korišćenje pametnih telefona, što je jedno od ograničenja primene skala na kome bi trebalo raditi. U osnovi ovakvih skala je hipoteza da problematična upotreba pametnih telefona ne korelira toliko sa dužinom korišćenja telefona, već sa nekim osobinama ličnosti, kao što su nedostatak samopouzdanja i impulsivnost (30). S druge strane, u skorije vreme razvijene su aplikacije koje prate korišćenje telefona, i kojima korisnici mogu da ograniče svoje korišćenje (postavljanjem vremenskog limita za određene aplikacije) (33,34). Međutim, kako aplikacije mere dužinu i frekvenciju korišćenja telefona, a ne disfunkcionalnu, odnosno problematičnu upotrebu, one istraživačima mogu pomoći u merenju korišćenja telefona, kao dopuna već razvijenim skalama. Korišćenje različitih skala kako bi se utvrdilo prisustvo zavisnosti, otežava poređenje dobijenih rezultata.

Međutim, i pored toga što je većina ovih skala osmišljena sa namerom da se u budućnosti koriste za kliničke svrhe (npr. zadijagnozu problematične upotrebe pametnih telefona), problematična upotreba pametnih telefona kao vrsta zavisnosti ne nalazi se u DSM-5 i MKB-11, te se skale još uvek koriste samo u istraživačke svrhe. Sve to ukazuje na potrebu za dodatnim istraživanjem ozbiljnosti i težine problematične upotrebe pametnih telefona i njenih posledica, kako bi se razmotrilo da li treba da zauzme mesto u sledećem izdanju DSM ili MKB.

Zaključak

Prema mnogim autorima „zavisnost od pametnih telefona" može se smatrati bihevioralnom zavisnošću. Upotreba termina „problematična upotreba pametnih telefona" i „zavisnost od pametnih telefona", različiti metodološki pristupi koji se koriste u izučavanju, kao što je primena različitih skala i nedostatak standardizovanih dijagnostičkih kriterijuma, otežavaju definisanje „zavisnosti od pametnih telefona". Dokazi da prekomerna upotreba telefona može imati različite psihološke, fiziološke i socijalne efekte, idu u prilog činjenici da je „zavisnost od pametnih telefona" kompleksan fenomen koji zahteva dodatna istraživanja.

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they were first introduced). Lopez-Fernandez and associates (32) have examined the psychometric characteristics of 8 versions of PMPUQ-SV in different languages (German, French, English, Finish, Spanish, Italian, Polish and Hungarian). The structure of PMPUQ-SV has been confirmed for almost all the tested languages.

Most scales are self-assessment scales, and therefore, they cannot measure smartphone use in an objective and reliable way, which is one of the limitations of these scales that should be worked on. Such scales are based on the hypothesis that the problematic smartphone use does not correlate much with the duration of smartphone use, but with some personality traits such as the lack of self-confidence and impulsivity (30). On the other hand, applications, which follow the use of mobile phones, have been developed recently and users can limit their use (by setting the time limit for certain applications) (33,34). However, since these applications measure the length and frequency of mobile phone use, but not the dysfunctional, that is, problematic use, they may help researchers to measure mobile phone use, in addition to already developed scales. Using different scales to establish the existence of addiction hinders the comparison of obtained results.

However, despite the fact that most of these scales are designed to be used for clinical purposes in the future (e.g. for the diagnosis of problematic smartphone use), the problematic use of smartphones, as a type of addiction, is not in the DSM-5 and ICD-11, and therefore, these scales are used only for research purposes. All this points to the necessity of additional research of severity and gravity of problematic smartphone use and its consequences in order to consider whether it should be included in the next issue of DSM or ICD.

Conclusion

According to many authors, “smartphone addiction” can be considered a behavioral addiction. The use of the terms “problematic smartphone use” and “smartphone addiction”, different methodological approaches used in the study, such as the application of different scales and the lack of standardized diagnostic criteria, make it difficult to define “smartphone addiction”. The evidence that the excessive use of mobile phones can have different psychological, physiological and social effects speaks in favor of the fact that “smartphone addiction” is a complex phenomenon that requires additional research.

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ALCHAJMEROVA BOLEST: EPIDEMIOLOŠKE KARAKTERISTIKE I PREVENCIJA

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SAŽETAK

Alchajmerova bolest (AB) je progresivna neurodegenerativna bolest mozga koja predstavlja veliki javnozdravstveni izazov. U svetu, prema podacima za 2018. godinu, procenjen broj ljudi koji živi sa AB je bio najmanje 50 miliona. U Sjedinjenim Američkim Državama (SAD), prema podacima za 2021. godinu, čak 6,2 miliona ljudi uzrasta 65 i više godina živi sa AB. U poslednjih 20 godina, AB se 145,2% češće prijavljuje kao uzrok smrti, delom zbog toga što se uzrok smrti preciznije utvrđuje, a najviše zbog toga što je učestalost AB sve veća usled starenja populacije. Na osnovu broja izgubljenih godina „zdravog" života (engl. *Years of Life Lost* - YLL) AB je četvrti, a prema izgubljenim godinama života sa nesposobnošću određene težine i trajanja (engl. *Years of Life with Disability* - YLD) devetnaesti, a prema zbirnom indikatoru DALY-ju (godine života korigovane u odnosu na nesposobnost, engl. *Disability Adjusted Life Years* - DALY) šesti vodeći uzrok opterećenja američke populacije bolestima u 2016. godini. Nemodifikujući faktori rizika za nastanak AB su starosna dob, genetika, pozitivna porodična istorija, dok su modifikujući faktori rizika pušenje, dijabetes, gojaznost u srednjoj životnoj dobi, hipertenzija, prehipertenzija, povišene vrednosti holesterola, nedovoljna fizička aktivnost, nezdrava ishrana, kraće formalno obrazovanje, nizak nivo mentalne stimulacije na poslu, trauma mozga, loš san, zloupotreba alkohola i oštećenje sluha. Procenjuje se da se redukcijom modifikujućih faktora rizika može sprečiti ili odložiti 40% slučajeva Alchajmerove demencije (AD). Biomarkeri koji mogu da se koriste u cilju identifikovanja ove bolesti su beta-amiloidni protein koji formira beta-amiloidni plak, abnormalni tau protein koji se akumulira u neuronima, i postojanje inflamacije i atrofije mozga. Dok čekamo da istraživači pronađu lek za ovu bolest, važno je podizati svest o dostupnim skrining metodama za rano otkrivanje AB, kao i o mogućnostima prevencije.

Ključne reči: Alchajmerova bolest, epidemiologija, prevalencija, mortalitet, faktori rizika, biomarkeri

Uvod

Alchajmerova bolest (AB) je progresivna neurodegenerativna bolest mozga. Početak oboljenja može da se javi do 20 godina pre pojave simptoma. U početku, promene mozga su previše male da bi ih obolela osoba mogla primetiti simptome. Međutim, broj oštećenih i uništenih neurona se povećava tokom vremena, što dovodi do prvih simptoma kao što su gubitak pamćenja i poremećaj govora. Kasnije, osoba gubi sposobnost da obavlja osnovne telesne funkcije, postaje vezana za krevet uz neophodnost stalne nege, i na kraju umire.

U svetu, prema podacima za 2018. godinu, procenjen broj ljudi koji živi sa AB je bio najmanje 50 miliona (1). U Sjedinjenim Američkim Državama (SAD), prema podacima za 2021. godinu, čak 6,2 miliona ljudi uzrasta 65 i više godina živi sa AB (2). Takođe, predviđa se da će ovi brojevi dalje rasti sa povećanjem prosečne starosti stanovništva. Kada se uzmu u obzir veliki finansijski troškovi lečenja i nege pacijenata obolelih od AB, koji su procenjeni na jedan trilion američkih dolara 2018. godine (2), postaje očigledno da je AB veliki javnozdravstveni problem. Dok čekamo da istraživači naprave pomak prema pronalasku leka, važno je podizati svest o trenutno dostupnim metodama skrininga za rano otkrivanje AB i najčešćim faktorima rizika za ovo obolevanje, kao i o tome šta je moguće uraditi da bi se oni redukovali ili eliminisali.

Obolevanje

Prevalencija je proporcija, odnosno deo populacije sa oboljenjem (bez obzira kada je bolest nastala) u bilo kojoj tački vremena, dok je godišnja stopa incidencije broj novoobolelih tokom date

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ALZHEIMERS's DISEASE: EPIDEMIOLOGICAL CHARACTERISTICS AND ITS PREVENTION

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SUMMARY

Alzheimer's disease is a progressive neurodegenerative brain disease that is of immense public health interest. Worldwide, according to data from 2018, the approximated number of people living with Alzheimer's was at a minimum 50 million. In the United States, according to data from 2021, there were as many as 6.2 million people age 65 and over living with Alzheimer's. In the last 20 years, Alzheimer's disease is being recorded 145.2% more frequently as the cause of death, partially due to the cause of death being more accurately attributed, but mostly due to the growing frequency of Alzheimer's disease due to the aging of the population. Based on years of life lost(YLL), Alzheimer's disease was the fourth, according to years of life with disability (YLD) nineteenth and according to the sum indicator DALY (Disability Adjusted Life Years) sixth leading cause of burden amongst diseases in the USA in 2016. The nonmodifiable risk factors for developing Alzheimer's disease are age, genetics, and family history, while the modifiable risk factors are smoking, diabetes, midlife obesity, hypertension, prehypertension, high cholesterol, insufficient physical activity, unhealthy diet, shorter length of formal education, low level of mental stimulation at work, traumatic brain injury, poor sleep, alcohol abuse, and hearing impairment. It is estimated that by reducing the modifiable risk factors, 40% of cases of Alzheimer's dementia can be prevented or postponed. The biomarkers that can be used for early detection of this disease are beta-amyloid protein that forms beta-amyloid plaques, abnormal tau protein accumulated inside neurons, the existence of brain inflammation and atrophy. While we wait for researchers to find a cure for this illness, it is important to raise awareness of available screening methods for early detection of Alzheimer's disease and prevention opportunities.

Keywords: Alzheimers disease, epidemiology, prevalence, mortality, risk factors, biomarkers

Introduction

Alzheimer's disease is a progressive neurodegenerative brain disease. The disease's onset may occur up to 20 years before any symptoms appear. In the beginning, the brain changes are too small for the diseased individual to notice. However, the number of damaged and destroyed neurons grows over time, leading to the first symptoms like memory loss and speech impairment. Later, the person loses the ability to perform basic bodily functions, becomes bed-bound in need of permanent care, and finally passes away.

Worldwide, according to data from 2018, the approximated number of people living with Alzheimer's was at a minimum 50 million (1). In the United States, according to data from 2021, there were as many as 6.2 million people age 65 and over living with Alzheimer's (2). Furthermore, these numbers are projected to continue growing with the increase of the population's average age. When the high financial costs of treatment and caretaking of Alzheimer's patients, which were estimated to be 1 trillion USD worldwide in 2018 (2), are taken into account, it becomes apparent that Alzheimer's disease is of immense public health interest. While we wait for researchers to make progress towards finding a cure, it is important to raise awareness of currently available early detection screening methods for Alzheimer's disease and the most common risk factors for developing this illness, and what can be done to reduce or eliminate them.

godine u odnosu na broj stanovnika sredinom posmatrane godine. S obzirom da se vrlo retko dešava da ljudi mlađi od 65 godina obole od Alchajmerove demencije (AD), studije se uglavnom fokusiraju na starije uzraste.

U SAD, broj osoba sa svim demencijama, uključujući i Alchajmerovu, će nastaviti da raste zajedno sa brzim porastom broja stanovnika uzrasta 65 i više godina, a predviđa se da će ih u SAD biti 88 miliona do 2050. godine (2,3). Više od 11,3% Amerikanaca starijih od 65 godina imaju AD (4,5). Procenjuje se da je broj prevalentnih slučajeva ove bolesti 6,2 miliona na osnovu studije u kojoj su korišćeni klinički simptomi demencije. Dokazi koji su dobijeni u studijama koje su bile bazirane na biomarkerima, pokazuju da je kod mnogih ljudi postavljena neadekvatna dijagnoza AD (6,7). Ove studije su utvrdile da je na osnovu simptoma kod 15-30% osoba bila postavljena pogrešna dijagnoza AD, odnosno to su bila lica sa demencijom uzrokovanom nekim drugim oboljenjem ili poremećajem. Osim toga, naučnici su već duže vreme svesni činjenice da blago kognitivno oštećenje predstavlja početnu fazu kroz koju svi pacijenti oboleli od demencije moraju da prođu. Sa napredovanjem znanja o biomarkerima i dijagnostike, moguće je odrediti koji slučajevi blagog kognitivnog oštećenja su izazvani AB i dodati ove slučajeve broju osoba koje su obolele od AB.

Ako se pretpostavi da trenutno 30% osoba sa AD nema ovu bolest, to znači da u SAD ostaje 4 miliona osoba starih 65 i više godina koje su obolele od AD. U jednom sistematskom preglednom radu utvrđeno je da 16,6% osoba starih 65 i više godina ima blago kognitivno oštećenje (8). Studije o biomarkerima sa PET skenerom su pokazale da polovina ljudi sa blagim kognitivnim oštećenjem ima specifične promene na mozgu povezane sa AB (9,10). 16,6% osoba sa blagim kognitivnim oštećenjem u starosnoj grupi 65 i više godina, je otprilike 10 miliona, polovina od toga, dakle 5 miliona ima blago kognitivno oštećenje zbog Alchajmera, što znači da kada dodamo taj broj broju od 4 miliona slučajeva AD, dobijamo da oko 9 miliona ljudi ima AB u SAD. Neophodno je sprovesti populacione studije bazirane na upotrebi biomarkera radi verifikovanja ove procene.

Incidencija AB raste sa godinama i iznosi 0,4% u starosnoj grupi 56-74 godine, 3,2% u grupi 75-84 godina, i 7,6% kod osoba starijih od 85 godina (11). Zbog stalno rastućeg broja ljudi starih 65 i više godina u SAD, predviđa se da će se godišnji broj novoobolelih od AD i drugih demencija udvostručiti do 2050. godine (12).

Pokazano je da je životni rizik od AB u 45. godini dva puta viši kod žena nego kod muškaraca (1 od 5 za žene u poređenju sa 1 od 10 za muškarce), a ovaj rizik dalje raste posle 65 godine kod oba pola (13). Otprilike dve trećine osoba sa AD su žene, odnosno 3,8 miliona u odnosu na 6,2 miliona slučajeva (14). Međutim, 3,8 miliona žena i 2,4 miliona muškaraca čine 12%, odnosno 9% populacije koja je starija od 65 godina u odnosu na pol (15), što daje temelj teoriji da s obzirom da je starost glavni faktor rizika za AB, žene imaju veći životni rizik za AB jer duže žive. Druga moguća objašnjenja se baziraju na rodnim razlikama po pitanju obrazovanja, zanimanja i zdravstvenog ponašanja, i biološkim razlikama među polovima. Takvi primeri su gori uslovi obrazovanja za žene rođene u prvoj polovini 20. veka (16) i rodna razlika u profesionalnim postignućima. Nedavno je pokazano kako su žene koje su radile u ranijim fazama života imale bolje kognitivne ishode kasnije tokom života (17).

Kada su u pitanju biološke razlike među polovima, brojne studije ukazuju da APOE-e4 genotip utiče na to da žene više obolevaju od AD (18,19) i neurodegenerativnih oboljenja (20) nego muškarci. Slična je povezanost između APOE i AD kod oba pola, ali e4 genotip je opasniji za žene u određenim starosnim dobima (21). Tau i beta amiloidni proteini su opasniji za žene s obzirom da isti nivoi izazivaju neurodegeneraciju i kognitivni pad brže kod žena nego kod muškaraca.

Nedavno objavljeni rezultati studija pokazuju da rizik od demencije blago opada u SAD i drugim zemljama sa visokim dohotkom (22-24). Međutim, broj ljudi sa demencijom će nastaviti da raste zbog porasta prosečne starosti stanovništva. Takođe, očekuje se da će 68% globalne prevalencije demencije do 2050. godine biti u zemljama sa niskim ili srednjim prihodima za koje ne postoje dokazi za smanjenje rizika od demencije (25).

Umiranje

U SAD AB je vodeći uzrok umiranja kako među osobama uzrasta 65 i više godina (zauzima peto mesto), tako i u celokupnoj populaciji (zauzima šesto mesto) (26). Najteži oblici AB često izazivaju ozbiljne komplikacije kao što su nepokretnost ili pneumonija, a pneumonija predstavlja najčešći

Morbidity

Prevalence is the proportion, meaning the part of the population with the disease (regardless of when the disease occurred) at any point in time, while the annual incidence rate is the number of new cases during a given year in relation to the population in the middle of the observed year. As it is quite rare for individuals under the age of 65 to develop Alzheimer's dementia, the studies primarily focus on older demographics.

In the USA, the number of individuals with all types of dementia, including Alzheimer's, will continue rapidly increasing along with the rapid increase of the population age 65 and older, which is projected to be 88 million in the United States by 2050 (2,3). Over 11.3% of Americans age 65 and older have Alzheimer's dementia (4,5). It is estimated that the number of prevalent cases of this disease is 6.2 million, based on a study that used clinical symptoms of dementia. Evidence obtained in biomarker-based studies showed that many people were inadequately diagnosed with Alzheimer's dementia (6-7). These studies found that based on symptoms, 15-30% of individuals were incorrectly diagnosed with Alzheimer's dementia, that is, those were individuals with dementia caused by a different disease or disorder. Additionally, for a long time, scientists have been aware that mild cognitive impairment (MCI) is a precursor stage through which all dementia patients pass through. With the improvements in knowledge of biomarkers and diagnostics, it is possible to determine which MCI cases are caused by Alzheimer's and add those cases to the number of individuals diseased from Alzheimer's.

If it is supposed that 30% of the current individuals with Alzheimer's dementia do not have this disease, that means that in the United States, there are 4 million individuals age 65 or older left with Alzheimer's dementia. It was determined in a systematic review that 16.6% of individuals age 65 and older have mild cognitive impairment (8). Biomarker studies with PET scans showed that half of the people with mild cognitive impairment have brain changes linked to Alzheimer's disease (9,10). 16.6% of individuals with mild cognitive impairment in the age group 65 or older is roughly 10 million, so 5 million have mild cognitive impairment due to Alzheimer's, meaning that when we add that number to the 4 million Alzheimer's dementia cases, we get a rough estimate of 9 million individuals with Alzheimer's in the USA. It is necessary to conduct population-based biomarker studies to verify this estimate.

Alzheimer's incidence is greatly increased with age and amounts 0.4% in individuals 56-74, 3.2% in individuals 75-84, and 7.6% in individuals age 85 or older (11). Due to the ever-growing number of individuals age 65 and older in the USA, the yearly new cases of Alzheimer's and other dementias are expected to double by 2050. (12)

It was shown that the estimated lifetime risk of Alzheimer's dementia at age 45 was twice as high in women than in men (1 in 5 for women compared to 1 in 10 for men), and these risks further increase for both sexes at age 65 (13). Approximately two-thirds of individuals with Alzheimer's dementia are women, representing 3.8 million out of 6.2 million cases (14). However, the 3.8 million women and 2.4 million men represent 12% and 9% of their genders respective population age 65 or older (15) which lays the foundations for the theory that since age is the main risk factor for Alzheimer's, women have a higher lifetime risk for Alzheimer's because they live longer. Other possible explanations are based on gender differences in education, occupation and health behaviors, and biological differences between the sexes. Such examples are worse education conditions of women born in the first half of the 20th century (16) and a difference in occupational attainment between the genders. It was recently shown that females that participate in the workforce in the earlier stages of their lives had better outcomes in their cognition later in life (17).

In regards to biological sex differences, multiple studies suggest that APOE-e4 genotype impacts women towards developing Alzheimer's dementia (18,19) and neurodegeneration (20) stronger than men. The associations between APOE and Alzheimer's dementia are similar for both genders, but the e4 genotype is more dangerous for women in particular age ranges (21). Tau and beta-amyloid are more dangerous for women as the same levels cause neurodegeneration and cognitive decline faster in women than in men.

Some recent findings show that the risk of dementia has been decreasing slightly in the USA and other high-income countries (22-24). However, the number of people with dementia will continue growing due to the increase in the average age of

neposredni uzrok smrti kod osoba obolelih od AD (27). Kao i mnoga druga akutna stanja, pneumonija se često navodi kao primarni uzrok smrti kod osoba sa AB (28), što rezultira nemogućnošću da se odredi stvarni broj smrti izazvanih AB. Nedavno je objavljeno u jednoj studiji da je samo 5% od ukupno 14% smrtnih ishoda kod Amerikanaca starijih od 70 adekvatno pripisano demenciji na potvrdama o uzroku smrti za period 2000-2009. godine (29). Međutim, još je komplikovanije pravilno odrediti da je uzrok smrti AB zato što otprilike 15-30% osoba kod kojih je postavljena dijagnoza AD ima demenciju zbog nekog drugog uzroka (7,8).

U poslednjih 20 godina, AB je kao prijavljeni uzrok smrti porasla za 145,2%, što je rezultat toga da se uzrok smrti češće pravilno pripisuje ovoj bolesti i što je ona češće uzrok smrti zbog starenja populacije (26). U proseku, osobe sa dijagnozom AD preživljavaju 4 do 8 godina, i žive sa njom čak do 20 godina u retkim slučajevima (30). Stoga se procenjuje da dve trećine umrlih od demencije umre u domovima za stara lica (31).

Na osnovu broja izgubljenih godina "zdravog" života (engl. *Years of Life Lost* - YLL) AB je četvrti, a prema izgubljenim godinama života sa nesposobnošću određene težine i trajanja (engl. *Years of Life with Disability* - YLD) devetnaesti, a prema zbirnom indikatoru DALY-ju (godine života korigovanih u odnosu na nesposobnost, engl. *Disability Adjusted Life Years* - DALY) šesti vodeći uzrok opterećenja američke populacije bolestima u 2016. godini (32).

Faktori rizika

Kasna manifestacija AB, odnosno manifestacija bolesti kod osoba starih 65 i više godina, predstavlja najčešći oblik AB. Veruje se da je ova bolest rezultat multiplih faktora, a ne samo jednog faktora. Nemodifikujući faktori rizika za AB su uzrast, genetika, i porodična istorija. Ovi nemodifikujući faktori su takođe najvažniji faktori rizika za kasniju manifestaciju AB. Uzrast predstavlja najznačajniji faktor s obzirom da procenat ljudi koji obolevaju od AD u velikoj meri raste sa starenjem. U SAD, samo 5,3% osoba u uzrasnoj grupi 65-75 godina ima AD; postoji značajan porast od 13,8% u starosnoj grupi 75-84 godine, i 34,6% kod osoba starijih od 85 godina sa ovim tipom demencije (5). Važno je zapamtiti da AD nije normalan deo procesa starenja i da godine nisu dovoljan razlog za obolevanje od AD (33).

Pronađeno je više gena koji povećavaju rizik od obolevanja, a najviše se ističe APOE-e4 gen, s obzirom da ima najviše uticaja na kasniji početak AB. Ovaj gen kodira jedan od proteina nosača holesterola u krvotoku, i svi ljudi nasleđuju jedan od tri alela ovog gena od svakog roditelja. Aleli su e2, e3, i e4 tako da ima šest mogućih kombinacija alela. Oblik e4 povećava rizik u poređenju sa e3, dok e2 smanjuje rizik u poređenju sa oblikom e3. Na primer, osobe sa e4/e3 ili e4/e2 imaju tri puta veći rizik od obolevanja od AB od ljudi sa e3/e3 oblikom, dok osobe sa e4/e4 oblikom imaju 8-12 puta veći rizik od obolevanja od ljudi sa e3/e3 kombinacijom (34-36). Ovo se najverovatnije dešava zato što osobe sa e4 oblikom imaju veće šanse za beta-amiloidnu akumulaciju u ranijoj životnoj dobi od ljudi sa druga dva alela (37).

Porodična istorija AB nije neophodna da bi se obolelo od ove bolesti, ali ako neko ima rođaka iz najbliže porodice sa AB u velikoj meri povećava se rizik (34). Taj rizik se dodatno povećava ukoliko neko ima više od jednog člana najuže porodice obolelog od AB (38). Roditelj oboleo od AB povećava rizik bez obzira na nasleđivanje e4 alela, najverovatnije zbog negenetskih faktora poput istih uslova života i navika (39).

Modifikujući faktori rizika su faktori rizika koji se mogu menjati da bi se smanjio rizik od obolevanja od AD. Ukazano je da bi prilagođavanje ovih faktora moglo da spreči ili odloži 40% slučajeva demencije (40). Naravno smanjivanje rizika ne znači sigurno prevenciju demencije. Osobe koje upražnjavaju mere koje smanjuju rizik od demencije i dalje mogu da obole, ali je manje verovatno da će se to dogoditi i ukoliko se dogodi osobe će oboleti mnogo kasnije nego oni koji nisu ništa preduzeli. Takođe, razvijanje demencije ne mora da bude povezano sa lošim navikama koje direktno utiču na mozak. Mozak troši 20% kiseonika i energije. Zbog toga, faktori koji povećavaju rizik od kardiovaskularnih bolesti takođe povećavaju rizik od AD. Primeri takvih faktora rizika su: pušenje (41), dijabetes (42), gojaznost u srednjoj životnoj dobi (43,44), hipertenzija (45,46), prehipertenzija (47), i visok holesterol (48), za koje je dokazano da povećavaju rizik od AD. Ako se uzme u obzir kardiovaskularni aspekt prevencije demencije, dokazano je da fizička aktivnost (45,50) i pravilna ishrana (51,52) smanjuju rizik od AD u poređenju sa korišćenjem suplemenata, poput vitamina C, D i E,

the population. Additionally, it is expected that 68% of the global prevalence of dementia by 2050 will be in low and middle-income countries for which there is no evidence of decreasing risk of dementia (25).

Mortality

In the USA, Alzheimer's disease is a leading cause of death both amongst individuals age 65 and over (fifth place) and in the entire population (sixth place) (26). The most severe form of Alzheimer's disease frequently causes severe complications like immobility or pneumonia, and pneumonia is the most common immediate cause of death in people with Alzheimer's dementia (27). Like many other acute conditions, pneumonia is frequently listed as the primary cause of death for individuals with Alzheimer's (28), which results in difficulty determining the actual number of deaths from Alzheimer's. It was recently published in a study that only 5% of the total 14% of deaths in Americans aged 70 or older were properly attributed to dementia on the death certificate between 2000-2009 (29). However, it is even more complicated to properly attribute deaths to Alzheimer's as approximately 15% to 30% of individuals diagnosed with Alzheimer's dementia have dementia due to another cause (7,8).

In the last 20 years, Alzheimer's disease has increased by 145.2% as the recorded cause of death, representing both deaths being properly attributed to Alzheimer's disease more frequently and Alzheimer's more commonly being the cause of death due to the aging of the population (26). On average, individuals diagnosed with Alzheimer's dementia survive for four to eight years, living even up to 20 years in rare cases (30). Because of this, it is estimated that two-thirds of individuals deceased due to dementia die in nursing homes (31).

Based on years of life lost (YLL), Alzheimer's disease was the fourth, according to years of life with disability (YLD) nineteenth and according to the sum indicator DALY (Disability Adjusted Life Years - DALY) sixth leading cause of burden amongst diseases in the USA in 2016. (32)

Risk Factors

Late-onset Alzheimer's, which is the manifestation of Alzheimer's amongst individuals age 65 or older, is the most common form of Alzh-eimer's disease. It is believed to result from multiple rather than one factor. The nonmodifiable risk factors for Alzheimer's disease are age, genetics, and family history. These nonmodifiable factors are also the most important risk factors for late-onset Alzheimers. Age is the most significant factor as the percentages of people with Alzheimer's dementia greatly increase with age. In the USA, only 5.3 % of individuals in the age range 65-75 have Alzheimer's dementia; there is a significant increase to 13.8 % in the range of 75-84, and 34.6% of individuals over the age of 85 have this type of dementia(5). It is important to remember that Alzheimer's dementia is not a normal part of the aging process and that age alone is not a sufficient cause for developing Alzheimer's dementia (33).

Multiple genes that increase the risk of developing Alzheimer's have been found, the most notable being the APOE-e4 gene, as it has impacts late-onset Alzheimer's risk the most. This gene codes for one of the cholesterol transporting proteins in the bloodstream, and all people inherit one of three alleles of this gene from each parent. The alleles are e2, e3, and e4, so there are six possible allele combinations. Having the e4 form increases risk compared to the e3 form, and having the e2 form decreases risk compared with the e3 form. I.e., individuals with e4/e3 or e4/e2 have three times higher risk of developing Alzheimer's than people with the e3/e3 form, while individuals with e4/e4 form have an 8-12 times greater risk of developing Alzheimer's than people with e3/e3 form(34-36). This is most likely due to individuals with the e4 form having a higher chance of beta-amyloid accumulation earlier in their lives than people with the other two alleles(37).

A family history of Alzheimer's is not required to get the disease, but having a first-degree relative with Alzheimer's greatly increases the risk (34). That risk is further increased if an individual has more than one first-degree relative with Alzheimer's disease (38). A parent with Alzheimer's increases the risk regardless of e4 allele inheritance, most likely due to shared non-genetic factors like living conditions and life habits (39).

Modifiable risk factors are risk factors that can be changed to decrease the risk of developing Alzheimer's dementia. It has been suggested that adjusting these factors could prevent or delay 40% of dementia cases(40). Naturally, reducing

za koje je pokazano da nisu efikasni u smanjivanju obolevanja od ove bolesti (53).

Pokazano je da duže formalno obrazovanje smanjuje rizik od AB (54,55). Veruje se da je to zbog toga što mozak razvija sposobnost da na fleksibilan i efikasan način koristi neuralnu mrežu, koja omogućava da se kognitivni zadaci obavljaju uprkos promenama u mozgu (56,57). Takođe, rad u sredini koja je mentalno stimulativna, i bavljenje stimulativnim aktivnostima, ima sličan efekat (58). Razlog ovih odnosa je nepoznat, međutim, duže formalno obrazovanje je obično znak višeg socioekonomskog statusa, što je protektivni faktor (59). Još jedan primećen trend je da osobe kraćeg formalnog obrazovanja imaju više kardiovaskularnih rizika, koji su već dokazani kao rizici za AB.

Neke studije ukazuju da socijalne i mentalne aktivnosti imaju dobrobiti za zdravlje mozga i da smanjuju rizik za AB (60,61), međutim moguće je da je ova veza primećena zato što ljudi sa oštećenjem mozga i AB gube želju za socijalnim i mentalnim aktivnostima. Sve ovo ukazuje na neophodnost sprovođenja daljih istraživanja.

Traumatska povreda mozga (TPM) narušava normalnu funkciju mozga kao posledica povrede glave i pokazano je da povećava rizik od demencije (62). Najčešće je trauma izazvana saobraćajnim nesrećama i nakon udarca u neki predmet (63). Svaka TPM dalje povećava rizik od demencije (64); dokazano je da čak i blage TPM povećavaju rizik od demencije (64), dok osobe koje su imale TPM dobijaju AB ranije od osoba bez istorije takve povrede.

Hroničnu traumatsku encefalopatiju (HTE) izazivaju ponovljeni udarci u glavu, povrede koje se obično dobijaju u kontaktnim sportovima. Na primer, igrači američkog fudbala imaju 30% veći rizik da dobiju HTE po godini igranja (65). Jedan pregledni članak navodi ponovnu traumu mozga kao najveći faktor rizika za razvijanje promena na mozgu povezanih sa HTE (66). Zajednička stvar za HTE i AB su abnormalni čvorovi tau proteina u mozgu, dok su beta-amiloidni plakovi retki u THE (62,63).

Među ostalim faktorima rizika koji pokazuju potencijalno značajnu vezu sa AB su nedovoljan ili loš san (67), zloupotreba alkohola (68), depresija (69) i oštećenje sluha (70). Daunov sindrom, takođe, predstavlja značajan faktor rizika za AB s obzirom da su osobe sa ovim sindromom rođene sa tri kopije 21. hromozoma, koji kodira proizvodnju amiloidnog prekursorskog proteina i može da poveća beta-amiloidnu proizvodnju u mozgu. Stoga je to najverovatnije razlog zašto 30% osoba sa Daunovim sindromom uzrasta od 50 do 60 godina i 50% starijih od 60 godina imaju AB (71).

Biomarkeri

Biomarkeri su merljive biološke promene koje mogu da se koriste da se utvrdi da li neka osoba ima neku bolest ili je u riziku da oboli. U slučaju AB, ovi biomarkeri su nagomilavanje fragmenata beta-amiloidnog proteina što formira beta-amiloidni plak van neurona i nagomilavanje abnormalnog tau proteina unutar neurona. Beta-amiloidni plak i njegovi oligomeri utiču na komunikaciju između neurona u sinapsama, dok sa druge strane nagomilani abnormalni tau protein sprečava transport nutrijenata i drugih molekula koji su ključni za neurone i njihovu funkciju. Iako nema dovoljno podataka o sveobuhvatnim mehanizmima AB, povećano nagomilavanje beta-amiloida se povezuje sa daljim povećanjem količine tau proteina (72,73). Toksični efekti ova dva proteina aktiviraju imunske ćelije mozga, mikroglije, koje pokušavaju da očiste toksične proteine i mrtve ćelije. Ako je stopa odumiranja ćelija prebrza da bi ih mikroglije očistile, to može dovesti do hroničnog zapaljenja. Atrofija ili smanjena zapremina mozga se javlja zbog gubitka ćelija. Još jedan uobičajen simptom AB koji dalje negativno utiče na moždanu funkciju je smanjena sposobnost mozga da metabolише njegov primarni izvor energije, glukozu. Veza između ovih biomarkera sa AB je potvrđena kroz studije na ljudima koji su dominantno imali naslednu AB. Ovi ljudi imaju retka genetska stanja koja izazivaju AB, i utvrđeno je da su kod njih nivoi beta-amiloidnih proteina u mozgu bili značajno povišeni 22 godine pre nego što se očekivalo da će se simptomi pojaviti (74). Takođe, metabolizam glukoze je kod njih počeo da opada 18 godina pre nego što su simptomi bili očekivani, dok je atrofija mozga počela da se javlja 13 godina pre očekivanog vremena za simptome (74). Druga studija na ovom tipu pacijenata je otkrila da količina abnormalnog tau proteina počinje da raste kada beta-amiloidni plakovi počnu da se formiraju, što može da bude dve decenije pre formiranja tau čvorova (75).

Veruje se da će upotreba pozitronske emisione tomografije mozga, kao i analiza proteinskog sastava likvora i krvi postati nezamenjivi alati za otkrivanje AB dovoljno rano za adekvatan farma-

risk factors does not mean assured dementia prevention. Individuals practicing measures that reduce the risk of dementia can still develop it, but it is significantly less likely to happen, and if it does happen, the individuals will develop it much later in their lives compared to those who had done nothing about it. Furthermore, developing dementia does not have to be linked to bad practices that directly impact the brain. The brain consumes 20% of oxygen and energy supply. Because of that, factors that increase the risk of developing cardiovascular disease also increase the risks of developing Alzheimer's dementia. Examples of such factors are smoking (41), diabetes (42), midlife obesity (43,44), hypertension (45,46), prehypertension(47), and high cholesterol (48), which have all been proven to increase the risk of Alzheimer's dementia. In relation to the cardiovascular aspect of dementia prevention, physical activity (45-50) and a healthy diet (51,52) both reduce risks of Alzheimer's dementia compared to supplements like vitamins C, D, and E, which have been shown as ineffective at reducing the chance of this illness (53).

It has been shown that a longer formal education lowers the risk for Alzheimer's (54,55). It is believed this is due to the brain developing the ability to make flexible, efficient use of the neural network, making performing cognitive tasks easier despite changes in the brain (56,57). In addition, being employed in a mentally stimulating environment and engaging in other mentally stimulating activities achieves a similar effect (58). The reason for these relations is unknown, however, longer formal education is usually a sign of a higher socioeconomic status, which is a protecting factor (59). Another observed trend is that individuals with shorter formal education have more cardiovascular risks, which have already been proven as Alzheimer's risks.

Some studies suggest that social and mental activity are beneficial for brain health and reduce Alzheimer's risk (60,61), but it could also be possible that this correlation is seen because people with brain damage and Alzheimer's lose the desire for social and mental activity. All these facts point towards the necessity of conducting further research.

Traumatic Brain Injury (TBI) disrupts normal brain function due to head injury and has been shown to increase the risk of dementia (62). Most frequently, the trauma is caused in car accidents and upon being impacted by an object (63). Each TBI further increases the risk of dementia (64); it has been proven that even mild TBI's double the risk of dementia (64), and individuals that had TBI get Alzheimer's at an earlier age than individuals with no history of that injury.

Chronic traumatic encephalopathy (CTE) is caused by repeated blows to the head, often sustained in contact sports. For example, football players have a 30% increased risk of developing CTE per year played (65). A review article identifies repetitive brain trauma as the biggest risk factor for developing CTE-related brain changes (66). The common thing about CTE and Alzheimer's is abnormal protein tau tangles in the brain, however, beta-amyloid plaques are rare in CTE (62,63).

Among the other risk factors studied that show a potential significant relation to Alzheimer's disease are insufficient or poor sleep (67), alcohol abuse(68), depression (69), and hearing impairment (70). Down syndrome is also a significant risk factor for Alzheimer's disease as individuals with it are born with three copies of the chromosome 21, which codes for APP production and may increase beta-amyloid production in the brain. That is the most likely reason why 30% of individuals with Down syndrome age 50-60 and 50% age 60 and older have Alzheimer's (71).

Biomarkers

Biomarkers are measurable biological changes that can be used to determine whether an individual has a disease or a risk of developing it. In Alzheimer's disease, these biomarkers are accumulation of the beta-amyloid protein fragment forming beta-amyloid plaques outside of neurons and accumulation of abnormal tau protein inside neurons. Beta-amyloid plaques and their oligomers interfere with the communication between neurons at synapses, while on the other hand, accumulated abnormal tau protein prevents the transport of nutrients and other molecules that are vital for the neurons and their function. Although there is much to be learned about the overarching mechanisms of Alzheimer's disease, increasing beta-amyloid accumulation is associated with subsequent increases in the amount of tau protein (72-73). These two proteins' toxic effects

kološki tretman koji potencijalno može zaustaviti ili usporiti progresiju bolesti kada odgovarajući lekovi postanu dostupni u budućnosti. Biomarkerski testovi će takođe biti ključni za praćenje efikasnosti lečenja i odabir pacijenata koji pate od specifičnih tipova Alchajmerove patologije za koju će lekovi biti dizajnirani (76). Najbolji test ili kombinacije testova će zavisiti od specifičnog stanja pacijenta (77).

Zaključak

AB je veliki javnozdravstveni problem zbog sve većeg broja obolelih naročito u populaciji starih 65 i više godina, koja je je u stalnoj ekspanziji. U bliskoj budućnosti najveći teret ove bolesti podneće zemlje u razvoju. Iz ovih razloga, posebnu pažnju treba posvetiti istraživanjima usmerenim na pronalaženje adekvatnog farmakološkog tretmana, kao i metoda za rano otkrivanje ovog oboljenja na osnovu biomarkera. Dok čekamo ovaj napredak u nauci, ne treba tapkati u mestu, već treba raditi na podizanju svesti o faktorima rizika za nastanak ovog oboljenja u cilju procene ličnog rizika i preduzimanja adekvatnih preventivnih mera.

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activate the brain immune cells, microglia, which attempt to clean the toxic proteins and dead cells. If the rate of decaying cells is too fast for the microglia to clean, it might lead to chronic inflammation. Atrophy or decreased brain volume occurs due to cell loss. Another common symptom of Alzheimer's disease that further negatively impacts brain function is the decreased ability of the brain to metabolize its primary energy source, glucose. The relationship of these biomarkers to Alzheimer's was confirmed through studies on people with dominantly inherited Alzheimer's disease. These people have rare genetic conditions that cause Alzheimer's, and it was determined that they had significantly increased beta-amyloid levels in the brain 22 years before symptoms were expected to develop (74). Additionally, glucose metabolism started deteriorating 18 years before the symptoms were expected, while brain atrophy started occurring 13 years before the expected time for symptoms (74). A different study on this patient type revealed that the amount of abnormal tau protein starts increasing when beta-amyloid plaques start forming, which can be up to two decades prior to the formation of tau tangles (75).

It is believed that the use of positron emission tomography to study the brain as well as analysis of cerebrospinal fluid and blood protein composition will become irreplaceable tools for identifying Alzheimer's disease early enough to receive proper pharmacological care with the potential to stop or slow the progression of Alzheimer's disease when these treatments become available in the future. The biomarker tests will also be critical for observing the efficiency of the treatment and selecting patients who suffer from specific types of Alzheimer's pathology the drugs will be designed to affect (76). The best tests or test combinations will warry depending on the patients' specific conditions (77).

Conclusion

Alzheimer's disease is a major public health issue due to the ever-growing number of diseased individuals, especially in the continuously expanding population of people age 65 and over. In the near future, developing countries will bear the largest burden of this disease. For these reasons, special attention must be given to research focused on finding appropriate pharmacological treatments and on early biomarker-based detection methods. While we wait for these scientific advancements, we must not stand idle but need to raise awareness about known risk factors for this illness to assess personal risk and take adequate preventive measures.

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PROFESIJA SESTRINSTVA U SAVREMENOM SISTEMU ZDRAVSTVENE ZAŠTITE I JAVNOM ZDRAVLJU: NOVE ULOGE I IZAZOVI

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SAŽETAK

Imajući u vidu opšti značaj brige o zdravlju stanovništva, jasno je da sistem zdravstvene zaštite predstavlja jedan od najsloženijih sistema jedne države u organizacionom smislu, sa elementima koji efikasnim funkcionisanjem treba da obezbede fizički, geografski i ekonomski dostupnu, integrisanu i kvalitetnu zdravstvenu zaštitu. Istorijski posmatrano, sestrinstvo je kao profesija prolazilo kroz niz razvojnih faza, uvek nastojeći da odgovori postavljenim izazovima struke i prati savremene trendove i potrebe društva. Definisanjem sestrinstva kao integralne i samostalne profesije u okviru sistema zdravstvene zaštite, pred savremenu medicinsku sestru je postavljen čitav niz profesionalnih, obrazovnih i društvenih izazova, naročito u onim zemljama u kojima sestrinska profesija još uvek ima neadekvatan društveni imidž, kako u javnosti, tako i u profesionalnim krugovima. Promena uloge medicinskih sestara u reformisanim evropskim i severnoameričkim zdravstvenim sistemima je naročito vidljiva u primarnoj zdravstvenoj zaštiti i javnom zdravlju, gde su sestre preuzele jednu od vodećih uloga u organizaciji sistema rada. Sa jedinstvenim profesionalnim fokusom koji istovremeno može biti usmeren na pojedinca i porodicu, ili sistem i zajednicu, savremeno sestrinstvo je, kao zdravstvena profesija, izuzetno povoljno pozicionirano da odgovori na potrebu savremenog društva za integracijom zdravstvenih usluga, i ujedno ostvari aktivan doprinos pozitivnim promenama u organizaciji savremenog sistema zdravstvene zaštite.

Ključne reči: sestrinstvo, sistem zdravstvene zaštite, javno zdravlje

Uvod

Briga o bolesnima i nemoćnima je stara koliko i ljudski rod, i istovremeno predstavlja jedan od najstarijih oblika organizovane profesionalne delatnosti usmerene ka potrebama čoveka, njegovom zdravlju i blagostanju. Upravo na tim temeljima, britanska bolničarka i humanista Florens Najtingejl u 19. veku osniva savremeno sestrinstvo, danas najčešću zdravstvenu profesiju u sistemima zdravstvene zaštite širom sveta (1). Kroz istoriju, sestrinstvo je kao profesija prolazilo niz razvojnih faza, uvek nastojeći da odgovori postavljenim izazovima struke, prati savremene trendove i potrebe društva, ali i razvoj komplementarnih nauka koje se nalaze u osnovi zdravstvene nege, bazične naučne discipline u sestrinskoj profesiji. Od pomagačke profesije, koja je u početku bila okrenuta isključivo ka bolesti i bolesniku, savremeno sestrinstvo je danas oblast profesionalne delatnosti diplomiranih medicinskih sestara, zdravstvenih stručnjaka koji samostalno, ili u okviru multidisciplinarnog zdravstvenog tima, primenjuju veliki broj intervencija u cilju unapređenja zdravlja, prevencije bolesti, kao i nege, lečenja i rehabilitacije obolelih osoba. Može se reći da je za današnji nivo profesionalne razvijenosti i integriteta sestrinske profesije najzaslužnija medicinska sestra, istraživač i univerzitetski profesor Virdžinija Henderson (1897-1996). Definisanjem sestrinstva kao „holistički nastrojene zdravstvene profesije u čijem je fokusu čovek pri različitim nivoima zdravlja, od začetka života do smrti“, kao i procesa zdravstvene nege, kao naučnog metoda rada medicinskih ses-

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NURSING PROFESSION IN THE CONTEMPORARY HEALTHCARE SYSTEM AND PUBLIC HEALTH: NEW ROLES AND CHALLENGES

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SUMMARY

Given the general importance of caring for the health of the population, it is understood that the healthcare system is organizationally one of the most complex systems in a country, with elements that should provide physically, geographically, and economically accessible, integrated and quality healthcare. Historically, nursing as a profession has gone through several developmental stages, always trying to respond to professional challenges and follow modern trends and needs of society. By defining nursing as an integral and independent profession within the healthcare system, the modern nurse is faced with a number of professional, educational, and social challenges, especially in those countries where the nursing profession still has an inadequate social image, both in public and professional environment. The change of nurseś professional role in reformed European and North American healthcare systems is particularly visible in primary health care and public health, where nurses have taken on one of the leading roles in the organization of the work process. With a unique professional focus that can be directed on the individual and family, or system and community, modern nursing as a healthcare profession is extremely well-positioned to respond to the need of modern society for the integration of health services and to make an active contribution to positive changes in the modern healthcare system, at the same time.

Key words: nursing, healthcare system, public health

Introduction

Caring for the sick and helpless is as old as human civilization, and at the same time, it represents one of the oldest forms of organized professional activity that is focused on people's needs, their health and well-being. Precisely on these foundations, in the 19th century Florence Nightingale, a British nurse and humanist founded modern nursing, which is the most common healthcare profession today in healthcare systems around the world (1). Historically, nursing as a profession has gone through several developmental stages, always trying to respond to professional challenges, follow modern trends and needs of society, as well as the development of complementary sciences that are at the base of healthcare, a basic scientific discipline in the nursing profession. From a helping profession, which was focused solely on the patient and disease at the beginning, today modern nursing is a field of professional activity of graduate nurses, health professionals who independently or within a multidisciplinary health team, apply a great number of interventions aimed at promoting health, prevention of diseases, as well as care, treatment and rehabilitation of patients. It could be said that Virginia Henderson (1897-1996), a nurse, researcher and university professor, is the most responsible for the current level of professional development and integrity of nursing profession. By defining nursing as a "holistic

tara, koji je zasnovan na „pružanju pomoći pojedincu, grupi ili zajednici kada im nedostaje snaga, volja ili znanje, na bilo kom od tri bazična aspekta zdravlja“, Hendersonova daje naučni temelj savremenom sestrinstvu i stvara uslove za aktivnu participaciju pripadnika ove profesije u zdravstvenom sistemu, na sva tri nivoa zdravstvene zaštite – primarnom, sekundarnom i tercijarnom (2,3). Determinacijom sestrinstva kao integralne i samostalne profesije u okviru sistema zdravstvene zaštite, pred savremenu medicinsku sestru je postavljen čitav niz profesionalnih, obrazovnih i društvenih izazova, naročito u onim zemljama u kojima sestrinska profesija još uvek ima neadekvatan društveni imidž, kako u javnosti, tako i u profesionalnim krugovima (4). Cilj ovog rada je da ukaže na nužnost promene dosadašnjeg položaja sestrinske profesije u zdravstvenom sistemu Srbije, kao i potrebu za racionalnijim pristupom u korišćenju njenih stručnih i kadrovskih potencijala, u povećanju efikasnosti i ukupnog kvaliteta ostvarenih usluga u integrisanom sistemu zdravstvene zaštite.

Profesija sestrinstva u savremenom sistemu zdravstvene zaštite

Svetska zdravstvena organizacija (engl. *World Health Organization*, WHO) definiše sistem zdravstvene zaštite kao zdravstvenu infrastrukturu koja obezbeđuje ostvarivanje spektra programa i usluga u cilju pružanja zdravstvene zaštite pojedincima, porodicama i zajednici (5). Imajući u vidu opšti značaj brige o zdravlju stanovništva, jasno je da sistem zdravstvene zaštite predstavlja jedan od najsloženijih sistema jedne države u organizacionom smislu, čiji elementi svojim funkcionisanjem treba da dovedu do dostizanja željenog cilja: obezbeđivanja fizički, geografski i ekonomski dostupne, integrisane i kvalitetne zdravstvene zaštite. Kvalitet ostvarenih zdravstvenih usluga se danas prepoznaje kao jedna od najvažnijih karakteristika savremenog sistema zdravstvene zaštite (6). U Srbiji, zdravstvena zaštita se ostvaruje na primarnom, sekundarnom (intermedijarnom) i tercijarnom (centralnom) nivou, koji su povezani u jedinstveni sistem u kome se podrazumeva da viši nivo zdravstvene zaštite uvek pruža podršku nižem (7,8). Multidisciplinarani zdravstveni sistem predstavlja imperativ razvoja savremene integrisane zdravstvene zaštite koja obuhvata sve aspekte zdravlja, bilo da je reč o pojedincu ili zdravlju zajednice u celini, i podrazumeva interprofesionalni i kolaborativni pristup zdravstvenih i drugih profesionalaca u prevenciji nastanka i rešavanju postojećih problema zdravlja (9,10).

Poslednjih desetak godina, u zdravstvenim sistemima širom sveta su započeti ili završeni različiti procesi reorganizacije i transformacije načina ostvarivanja zdravstvene zaštite stanovništva, kao i načina funkcionisanja organizacione strukture samih sistema zdravstvene zaštite. Bez obzira na formu sprovedenih aktivnosti, zajednički cilj ovih reformi je isti u većini slučajeva – stvaranje integrisanog zdravstvenog sistema koji će u potpunosti i sveobuhvatno biti orijentisan ka aktuelnim i potencijalnim zdravstvenim potrebama korisnika zdravstvene zaštite. Integracija zdravstvene zaštite omogućava ekonomski izuzetno važnu racionalizaciju zdravstvenih troškova, ali i efikasnije planiranje i organizaciju zdravstvene politike koja će dovesti do povećanja kvaliteta ostvarenih zdravstvenih usluga, uz istovremeno povećanje kvaliteta života zdravstvenih osiguranika (11). Nov način funkcionisanja zdravstvenih sistema koji objedinjuje aktivnosti primarnog, sekundarnog i tercijarnog zdravstvenog sektora, istovremeno donosi i niz novih uloga i profesionalnih izazova za zdravstvene i druge stručnjake koji su uključeni u kompleksan proces ostvarivanja zdravstvene zaštite. Imajući u vidu činjenicu da je sestrinstvo najmnogoljudnija profesija u zdravstvenim sistemima na globalnom nivou, jasno je da će medicinske sestre imati, ili već imaju, značajnu ulogu u novoj organizaciji sistema zdravstvene zaštite. Zahvaljujući boljem pozicioniranju sestrinske profesije u savremenom zdravstvenom sistemu, medicinska sestra, kao autonomni zdravstveni profesionalac i ravnopravan član multidisciplinarnog tima, dobija i mnogo više mogućnosti da aktivno doprinese ukupnom povećanju kvaliteta zdravstvene zaštite, i to putem sprovođenja neposrednih aktivnosti zdravstvene nege, brige za unapređenje i očuvanje zdravlja i obavljanja niza koordinatorskih i menadžerskih funkcija. Međutim, treba naglasiti da prihvatanje novih uloga u reformisanom sistemu zdravstvene zaštite svakako podrazumeva i prihvatanje složenijih oblika profesionalne odgovornosti od strane pripadnika sestrinske profesije, i ukazuje na nužnost uvođenja promena i unutar same profesije, prvenstveno u pogledu formalnog obrazovanja i edukacije medicinskih sestara za obavljanje funkcija rukovođenja (12,13).

healthcare profession focused on people at different health levels, from the beginning of life till death", as well as the process of healthcare, as a scientific method of nurses' work, which is based on "assisting the individual, group or community when they lack strength, will or knowledge in any of the three basic aspects of health", Henderson provides scientific foundations to modern nursing and creates conditions for the active participation of members of this profession in the healthcare system, at the three levels of healthcare – primary, secondary and tertiary (2,3). By determining nursing as an integral and independent profession within the healthcare system, the modern nurse is faced with a number of professional, educational and social challenges, especially in those countries where the nursing profession still has an inadequate social image, both in public and professional environment (4). The aim of this study is to point to the need to change the current position of the nursing profession in the healthcare system of Serbia, as well as to the necessity for the more rational approach to using the professional and personnel potentials in increasing the efficiency and overall quality of delivered services in the integrated healthcare system.

Nursing profession in the contemporary healthcare system

The World Health Organization defines the healthcare system as the healthcare infrastructure which provides a range of programs and services aimed at delivering healthcare to individuals, families and to the community (5). Given the general importance of caring for the health of the population, it is clear that the system of healthcare represents one of the most complex systems of one country in an organizational sense, and its elements should lead to the desired goal: provide physically, geographically and economically accessible, integrated and quality healthcare. The quality of delivered healthcare services is recognized today as one of the most important characteristics of the contemporary healthcare system (6). In Serbia, healthcare is realized at the primary, secondary (intermediary), and tertiary (central) levels that are connected and make the unique system, which means that the higher level of healthcare always supports the lower level (7,8). The multidisciplinary healthcare system presents the imperative of development of the contemporary integrated healthcare that encompasses all aspects of health, both individuals' health and the health of the community as a whole, and it involves interprofessional and collaborative approach of health professionals and other professionals regarding the prevention and solving the existing health problems (9,10).

In the last ten years, in the healthcare systems around the world, different processes of reorganization and transformation of healthcare of the population, as well as the organizational structures of healthcare have been started or completed. Although realized activities may be different, the mutual aim of these reforms is the same in most cases – creation of integrated healthcare systems which would be completely and comprehensively oriented towards current and potential health needs of healthcare users. The integration of healthcare enables economically important rationalization of health costs, as well as more efficient planning and organization of health policies that would lead to the increase in the quality of healthcare services, with the simultaneous increase in the quality of life of the insured people (11). This new mode of functioning of healthcare systems, which unites the activities of primary, secondary and tertiary health sector, brings a range of new roles and professional challenges for health professionals and other professionals that are involved in the complex process of healthcare. Having in mind the fact that the nursing profession is the most numerous in the healthcare systems globally, it is clear that nurses will have, or they already have a significant role in the new organization of the healthcare system. Thanks to the better position of nursing profession in the contemporary healthcare system, a nurse, as an autonomous health professional and equal member of the multidisciplinary team, is given a lot more possibility to actively contribute to the overall improvement of the quality of healthcare, by realizing immediate activities of health care, by caring for the improvement and maintenance of health and by performing coordinating and managing functions. However, it should be emphasized that accepting new roles in the reformed healthcare system means accepting more complex forms of professional responsibility by the members of nursing profession, and it points

Profesija sestrinstva, kao integralni deo multidisciplinarne organizacije rada u savremenom zdravstvenom sistemu, obuhvata niz oblasti profesionalnog delovanja na različitim nivoima zdravstvene zaštite: aktivnosti unapređenja i promocije zdravlja, prevenciju bolesti, zdravstvenu negu fizički i mentalno bolesnih ili onesposobljenih osoba svih uzrasnih kategorija, palijativnu negu, ali i niz aktivnosti koje se na prvi pogled ne mogu dovesti u direktnu vezu sa sestrinskom profesijom, poput poslova iz oblasti menadžmenta u sistemu zdravstvene zaštite, zastupanja interesa korisnika zdravstvene zaštite (zaštita prava pacijenata), promocije i sprovođenja aktivnosti zaštite i unapređenja životne sredine, naučnoistraživačkog rada, ili pak aktivne participacije u kreiranju zdravstvene politike zemlje (14). U integrisanim zdravstvenim sistemima, medicinske sestre, u saradnji sa ostalim zdravstvenim profesionalcima i stručnjacima iz drugih oblasti socijalne zaštite, obavljaju niz različitih aktivnosti planiranja, implementacije i evaluacije različitih aktivnosti zdravstvene nege, a sve u cilju obezbeđivanja efikasnog funkcionisanja zdravstvenog sistema sa aspekta promocije zdravlja, prevencije bolesti i zbrinjavanja bolesnih, odnosno onesposobljenih osoba (15).

Promena uloge medicinskih sestara u reformisanim evropskim i severnoameričkim zdravstvenim sistemima je naročito vidljiva u primarnom sektoru i zaštiti zdravlja zajednice, odnosno javnom zdravlju, u kojima su sestre preuzele jednu od vodećih uloga u organizaciji sistema rada. Na taj način, sestrinstvo sve češće predstavlja direktnu sponu između korisnika zdravstvene zaštite sa jedne, i sistema zdravstvene i socijalne zaštite sa druge strane, što od pripadnika ove profesije iziskuje doslednu primenu veština stečenih kontinuiranim izučavanjem načina funkcionisanja zdravstvenog sistema, uključujući i koordinaciju između definisanih nivoa zdravstvene zaštite, optimizaciju usluga putem racionalne upotrebe dostupnih podataka o bolesniku u zdravstvenoj zaštiti zasnovanoj na dokazima, interprofesionalnu saradnju i komunikaciju i, konačno, aktivnu participaciju u aktivnostima za poboljšanje efikasnosti zdravstvenog sistema (13). U dokumentu Inicijativa za budućnost sestrinstva (engl. *The Initiative on the Future of Nursing*) koji je 2010. godine izdat od strane Američkog instituta za medicinu (engl. *US Institute of Medicine, Washington DC*), navodi se da profesija sestrinstva daje kritičan doprinos reformi zdravstvenog sistema i aktuelnim zahtevima obezbeđivanja sigurnog, bezbednog i pristupačnog sistema zdravstvene zaštite, usmerenog ka objektivnim potrebama korisnika (16). Autori koji su istraživali nove uloge ove profesije u reformisanom zdravstvenom sistemu SAD sugerišu da svi pripadnici sestrinske profesije treba da, pre svega, razumeju i prihvate činjenicu da sestrinska praksa mora pretrpeti dramatične promene u cilju dostizanja očekivanog kvaliteta zdravstvene nege, ali i da proaktivno učestvuju u aktivnostima promena koje će zahtevati sticanje novih ili poboljšanje postojećih veština unapređenja i brige o zdravlju zajednice (12,13). U integrisanom sistemu zdravstvene zaštite, profesija sestrinstva ima i nove ciljeve: medicinske sestre nisu usredsređene na bolest, već na unapređenje zdravlja i primordijalnu prevenciju, u fokusu njihovih profesionalnih aktivnosti nisu potrebe sistema, nego pojedinaca i zajednice - korisnika zdravstvene zaštite, koordinacija koju sestre ostvaruju između različitih sektora zdravstvene zaštite je prepoznata kao ključ višeg kvaliteta, bolje usluge i niskih finansijskih troškova zdravstvenog sistema, a sve navedene aktivnosti su zasnovane na racionalnom korišćenju podataka koji su dostupni u zdravstvenom informacionom sistemu (12). Da bi se ovi ciljevi ostvarili, u reformisanim zdravstvenim sistemima je uz menadžerske funkcije identifikovano i devet suštinski značajnih aspekata sestrinske profesije koje treba kontinuirano i svakodnevno primenjivati u radu sa korisnicima, a u cilju postizanja veće efikasnosti zdravstvene zaštite:

1. pružanje podrške i obučavanje korisnika za primenu mera samopomoći,
2. edukacija i aktivno angažovanje pacijenta i porodice u ostvarivanju zdravstvene zaštite,
3. aktivnosti poboljšanja intersektorske komunikacije,
4. savetovanje korisnika zdravstvene zaštite i praktična demonstracija potrebnih veština,
5. utvrđivanje potreba, planiranje i evaluacija putem primene procesa zdravstvene nege,
6. timski rad i interprofesionalna saradnja,
7. planiranje nege na osnovu objektivnih potreba korisnika,
8. briga o unapređenju i očuvanju zdravlja celokupne populacije,

to the necessity of introducing changes within the profession, primarily in the sense of formal education and education of nurses for carrying out the management functions (12,13).

Nursing profession, as an integral part of the multidisciplinary organization of work in the contemporary healthcare system, involves a range of professional activities at different levels of healthcare: activities of the improvement and promotion of health, prevention of diseases, health care of physically and mentally ill or disabled people of all ages, palliative care, and a range of activities which at first cannot be associated with the nursing profession, including jobs from the field of management in the healthcare system, representing the interests of users of healthcare (protection of patients' rights), promoting and conducting the activities of the environment protection, scientific work, or active participation in creating the health policies of one country (14). In the integrated healthcare systems, nurses, in cooperation with other health professionals and experts from the field of social protection, perform different activities of planning, implementation and evaluation of different activities of healthcare, aimed at providing the efficient functioning of healthcare system from the perspective of health promotion, disease prevention and caring for the sick, that is, disabled persons (15).

The change of nurses' professional role in reformed European and North American healthcare systems is particularly visible in primary health care and health protection of community, that is, public health, where nurses have taken on one of the leading roles in the organization of the work process. Thus, nursing profession more often presents a direct link between users and healthcare on the one hand, and the system of health and social protection on the other hand, which means that the members of this profession need to apply all the skills that they acquired during the continuous studies of the ways in which the health system works, including the coordination between the defined levels of healthcare, optimization of services through the rational usage of available data about the patient in the healthcare based on evidence, interpersonal cooperation and communication, and finally, the active participation in activities for the improvement of the efficiency of health system (13). In The Initiative on the Future of Nursing, which was published by the US Institute of Medicine in Washington DC in 2010, it is claimed that the nursing profession gives a critical contribution to the reform of the health system and actual demands for providing secure, safe and accessible healthcare system, aimed at objective users' needs (16). The authors, who investigated the new roles of this profession in the reformed health system of the USA, suggest that all members of the nursing profession should, first of all, understand and accept the fact that nursing practice has to undergo dramatic changes aimed at achieving the expected quality of healthcare, and they should proactively participate in the changes that would demand acquiring new or improving the existing skills of care for the health of community (12,13). In an integrative system of health care, nursing profession has new aims: nurses are not focused on disease, but on the improvement of health and primordial prevention; the needs of the system are not in the focus of their professional activities, but the needs of individuals and community – users of health care; coordination that nurses achieve between different sectors of health care is recognized as a key of better quality, better services and low financial costs of the health system, while all the above mentioned activities are based on the rational usage of data which are available in the health information system (12). In order to achieve these aims in the reformed health system, in addition to management functions, there are nine essential aspects of nursing profession that should be continuously applied in everyday work with users, aimed at achieving greater efficiency of health care:

1. giving support and educating users to apply the self-help measures,
2. education and active engagement of patients and family in achieving their right to health care,
3. activities aimed at improving the communication between sectors,
4. giving advice to users of health care and practical demonstration of necessary skills,
5. determining needs, planning and evaluation through the application of health care process,
6. team work and interprofessional cooperation,
7. planning the care on the basis of users' needs,

9. zastupanje potreba korisnika zdravstvene zaštite (17).

Konačno, kada je reč o društvenom i profesionalnom položaju sestrinstva u našoj zemlji, treba istaći da je situacija već decenijama veoma složena i nimalo nalik onoj u svetu. Nažalost, profesija sestrinstva je do pre gotovo dve decenije bila jedina u državi kojoj je bilo onemogućeno obrazovanje na univerzitetskom nivou, a uloga sestrinstva u zdravstvenom sistemu Republike Srbije ne samo da je još uvek najvećim delom pasivna, već je i zastupljenost medicinskih sestara u institucijama republičkih zdravstvenih organa poražavajuće minimalna (18). Iako je od osnivanja prve katedre u zemlji za zdravstvenu negu na Medicinskom fakultetu Univerziteta u Novom Sadu do danas veliki broj srpskih medicinskih sestara stekao visoko obrazovanje, mogućnosti aktivnog doprinosa ove profesije u smislu poboljšanja efikasnosti sistema zdravstvene zaštite i povećanja kvaliteta zdravstvenih usluga još uvek nisu prepoznate u našoj zemlji, a radna mesta sestara sa visokim obrazovanjem nisu čak ni planirana aktuelnom sistematizacijom radnih mesta u zdravstvu. Uzimajući u obzir navedene promene i nove uloge koje su sestrinskoj profesiji donele reforme sistema zdravstvene zaštite u svetu, može se zaključiti da je sestrinstvo u savremenim zdravstvenim sistemima prepoznato kao autonomna profesija koja može značajno da doprinese efikasnosti sistema zdravstvene zaštite jedne zemlje poboljšanjem kvaliteta bazičnih profesionalnih aktivnosti, ali i preuzimanjem određenog dela menadžerskih funkcija i koordinacijom intersektorskih aktivnosti u procesu ostvarivanja zdravstvene zaštite. Rukovođenje zdravstvenim sistemima je veoma složen proces koji iziskuje adekvatan nivo formalnog obrazovanja i kontinuiranu edukaciju, naročito ako se ima u vidu činjenica da preduzetnički orijentisan menadžment u sistemu zdravstvene zaštite iziskuje aktivan angažman u pogledu iniciranja i sprovođenja različitih menadžerskih aktivnosti. Institut za medicinu SAD preporučuje da se svim medicinskim sestrama koje nisu unuverzitetski obrazovane omogući dodatno školovanje, upravo zbog složenosti menadžerskih uloga koje su u integrisanim sistemima zdravstvene zaštite dodeljene pripadnicima ove profesije, sa očekivanjem da će u neposrednoj budućnosti i do 80% medicinskih sestara u svetu imati fakultetsko obrazovanje (16). Edukacija iz oblasti zdravstvenog menadžmenta se postavlja kao neophodan preduslov za razumevanje i učestvovanje u promenama, ali i očuvanje integriteta sestrinske profesije, jer uspešan menadžer mora jasno da definiše ciljeve promena u profesiji i sistemu, nadzire proces njihove implementacije i da poseduje veštinu formulisanja plana i neposredne primene specifičnih aktivnosti koje će se primeniti u slučaju da promena ide u neželjenom pravcu (19). Uzimajući navedeno u obzir, čak i nakon proste analize aktuelne prakse u sestrinskoj profesiji naše zemlje, neizbežno se nameće pitanje da li medicinske sestre u Srbiji mogu da odgovore zahtevima savremene zdravstvene službe, jer primeri iz prakse često jasno ukazuju na to da sestre imaju nizak stepen autonomije u radu, čak i u neposrednoj organizaciji službe zdravstvene nege (20). Na osnovu primera iz sveta, jasno je da sestrinstvo mora da postane autonomna i ravnopravna profesija u sistemu zdravstvene zaštite Srbije da bi aktivno doprinosila pozitivnim promenama, ali i pored brojnih inicijativa Komore medicinskih sestara Srbije i visokoškolskih ustanova koje obrazuju ovaj profil zdravstvenih stručnjaka, vidljivih pomaka u tom smislu i dalje nema.

Profesija sestrinstva u javnom zdravlju

Profesija sestrinstva je dugi niz godina aktivno profesionalno uključena u rad u oblasti javnog zdravlja širom sveta. Povezanost sestrinstva i javnog zdravlja je suštinska, praktična i neraskidiva, zasnovana pre svega na zajedničkoj usmerenosti ka unapređenju i očuvanju zdravlja pojedinaca, grupe i zajednice, prevenciji bolesti i težnji ka povećanju kvaliteta života, ali i činjenici da zdravstveno vaspitanje istovremeno predstavlja i integralni deo zdravstvene nege, kao primenjene medicinske discipline, i jedan od osnovnih metoda rada u javnom zdravlju (21,22). Osim toga, u većini zemalja u svetu, pa i u našoj zemlji, medicinske sestre imaju mogućnost specijalizacije iz oblasti javnog zdravlja nakon završenih osnovnih studija. Američka asocijacija za javno zdravlje (engl. *The American Public Health Association*) definiše sestrinstvo u javnom zdravlju kao „praksu promocije i zaštite zdravlja stanovništva putem integrisane primene znanja iz oblasti zdravstvene nege, društvenih i javnozdravstvenih nauka" (23).

Profesionalna delatnost medicinskih sestara u oblasti javnog zdravlja je fokusirana na zdravl-

8. care for the improvement and maintenance of health of general population,
9. representing the needs of health care users (17).

Finally, as far as social and professional position of nurses in our country is concerned, it should be emphasized that for decades the situation has been very complex and not at all similar to the situation in the world. Unfortunately, nursing profession was the only profession in our country, whose members could not be educated at the university level two decades ago, while nurses' role is still for the most part passive in the health system of the Republic of Serbia, and the presence of nurses in the republic health institutions is critically low (18). Although a lot of nurses have got faculty degrees since the first department for health care at the Faculty of Medicine in Novi Sad was founded, the possibilities of active contribution of this profession in the sense of improvement of efficiency of the health care system and quality of health services have not been recognized in our country yet, and job positions of nurses with faculty degrees have not been planned in the actual systematization of job positions in health sector. Considering all the above mentioned changes and new roles that reforms of the healthcare system around the world brought to the nursing profession, one may conclude that the nursing profession in the contemporary health care systems has been recognized as an autonomous profession that may significantly contribute to the efficiency of health care of one country by improving the quality of basic professional activities, as well as by taking on certain amount of managerial functions and coordinating the intersectoral activities in the process of delivering health care. The management of health care systems is a very complex process which requires an adequate level of formal education and continuous education, especially if one considers the fact that the entrepreneurship-centered management in the health care system demands active engagement regarding initiating and conducting different managerial activities. The US Institute of Medicine recommends that all nurses, who do not have university degrees, should get the possibility of additional education, precisely because of complexity of managerial roles that have been given to the members of this profession, with expectations that in the near future 80% of nurses will have faculty degrees in the world (16). Education from the field of health management is required as a necessary prerequisite for understanding and participating in those changes, as well as the preservation of integrity of nursing profession, because a successful manager has to define clearly the aims of changes in the profession and system, to supervise the process of their implementation and to possess the skill of plan formulation and immediate application of specific activities that would be applied if the change went in an unwanted direction (19). Given the above mentioned, even after a simple analysis of current practice in the nursing profession in our country, a question arises whether nurses in Serbia could respond to the demands of the contemporary health care service, because examples from practice often point to the fact that nurses have a low level of autonomy in the work process, even regarding the immediate organization of health care service (20). According to the examples from the world, it is clear that the nursing profession has to become an autonomous and equal profession in the health care system of the Republic of Serbia in order to actively contribute to positive changes, however, despite initiatives of the Chamber of nurses of Serbia and institutions of higher education that educate this profile of health professionals, there are no visible advances in that direction.

Nursing profession in public health

For many years, the nursing profession has been actively and professionally involved in the field of public health around the world. The connectedness between nursing and public health is essential, practical and unbreakable, and based, first of all, on the mutual orientation towards the improvement and maintenance of health of individuals, groups and community, disease prevention and striving to improve the quality of life, as well as on the fact that at the same time health education is an integral part of health care, as the applied medical discipline, and one of the basic methods of work in public health (21,22). In addition, in most countries of the world, and in our country, as well, nurses have the possibility of specialization in public health after they get bachelor's degree. The American Public Health

je zajednice, sa ciljem promocije zdravlja i prevencije bolesti i onesposobljenosti. Znanje koje poseduju iz oblasti preventivnih i kliničkih nauka, kao i specifična vrsta profesionalnog odnosa sa korisnicima zdravstvene zaštite, omogućavaju medicinskim sestrama specijalistima javnog zdravlja da daju značajan doprinos rešavanju aktuelnih javnozdravstvenih problema i aktivno participiraju u kreiranju i implementaciji programa promocije zdravlja i zdravstvene politike u skladu sa potrebama vulnerabilnih populacionih grupa. U eri rastućih javnozdravstvenih izazova, sestrinstvo kao profesija ima značajan potencijal za stvaranje promena na ovom polju, zasnovan pre svega na čestim kontaktima medicinskih sestara sa korisnicima zdravstvene zaštite, što ih možda čini i najbolje pozicioniranim zdravstvenim stručnjacima u smislu mogućnosti pružanja podrške za usvajanje zdravih stilova života u zajednici. Imajući u vidu doktrinarni multidimenzionalni pogled na zdravlje, profesionalno delovanje u javnozdravstvenom sestrinstvu se temelji na primeni teorijskih znanja, zdravstvenoj nezi zasnovanoj na dokazima i predanosti postizanju jednakosti svih članova zajednice u mogućnostima za očuvanje i unapređenje zdravlja. Sa druge strane, upravo poznavanje kliničke zdravstvene nege u kombinaciji sa znanjima iz oblasti javnog zdravlja i društveno-humanističkih nauka, omogućava medicinskim sestrama da budu na pozicijama uspešnih lidera u oblasti javnog zdravlja (23,24). Osnovne profesionalne kompetencije medicinskih sestara u oblasti javnog zdravlja uključuju:

- procenu stanja u cilju identifikacije i rešavanja problema zdravlja u zajednici,
- uočavanje problema i postavljanje sestrinske dijagnoze u slučaju pojave poremećaja zdravlja i zdravstvenih katastrofa u zajednici,
- primenu zdravstveno vaspitnih intervencija, informisanje i osposobljavanje zajednice za različite načine očuvanja i unapređenja zdravlja,
- uspostavljanje partnerskog odnosa i motivaciju zajednice za aktivnu participaciju u identifikaciji i rešavanju aktuelnih i potencijalnih problema zdravlja,
- razvijanje profesionalne politike i planova koji podržavaju napore pojedinaca i zajednice u unapređenju i očuvanju zdravlja,
- primenu zakona i drugih pravnih regulativa koje štite zdravlje i osiguravaju bezbednost,
- omogućavanje dostupnosti zdravstvene zaštite i pružanje zdravstvenih usluga u slučaju da je ista nedostupna,
- obezbeđivanje potrebnog broja kompetentnih sestara specijalista javnog zdravlja,
- evaluaciju efikasnosti, dostupnosti i kvaliteta primenjenih zdravstvenih usluga kod pojedinaca i u zajednici i
- istraživanje u cilju spoznaje novih saznanja i inovativnih metoda za rešavanje problema zdravlja (25).

U savremenom sistemu zdravstvene zaštite, javnozdravstveno sestrinstvo teži da poboljša zdravstvene ishode svih populacionih grupa u zajednici, prepoznajući složenost javnozdravstvenih problema i kontekstualnu prirodu zdravlja, zasnovanu na istorijskim, kulturološkim, fizičkim, mentalnim, društvenim i faktorima životne sredine. Doktrina zdravstvene nege u javnom zdravlju nalaže logičko razmišljanje na nivou sistema (engl. *"system-level thinking"*), usmereno ka objektivnoj opservaciji i proceni stanja, utvrđivanju potreba za zdravstvenom negom, kao i proceni mogućnosti i (ne)jednakosti pojedinaca, porodice ili zajednice, a sve u cilju preduzimanja aktivnosti koje će prikupljene informacije o zdravlju pretvoriti u javno dobro (26). Ključni aspekti profesionalne delatnosti medicinskih sestara u javnom zdravlju uključuju: fokusiranost na zdravstvene potrebe celokupne populacije, uključujući i procenu potencijalne diskriminacije i specifičnih potreba marginalizovanih populacionih grupa, procenu zdravstvenog stanja stanovništva putem sveobuhvatnog, holistički usmerenog, sistematičnog pristupa zdravlju, sprovođenje preventivnih aktivnosti u populaciji sa akcentom na primordijalnu prevenciju, i primenu intervencija zdravstvene nege na svim nivoima – kod pojedinaca, porodica, celokupne zajednice, uključujući i sve faktore koji mogu uticati, ili već utiču, na njihovo zdravlje, potrebe, mogućnosti ili nejednakosti u zdravlju (25). Osim toga, od profesije sestrinstva se u savremenom javnom zdravlju očekuje uspostavljanje i održavanje odnosa aktivne saradnje sa zajednicom, kontinuirana participacija u vaspitanju za zdravlje njenih članova i razvoju lokalne zdravstvene politike koja će biti prilagođena potrebama konkretne zajednice. To ujedno predstavlja odgovor na izdvojene prioritete koji proističu iz kontinuirane, sve-

Association defines nursing in public health as "the practice of promoting and protecting the health of populations using the integrated knowledge from nursing, social and public health sciences" (23).

Professional activities of nurses in public health are focused on health of the community, aimed at the promotion of health and prevention of diseases and disabilities. Knowledge that nurses possess from the field of preventive and clinical sciences, as well as the specific kind of professional relations with the health care users enable nurses, public health specialists, to give significant contribution to solving the actual public health problems and to actively participate in creating and implementing the program of health promotion and health policies in accordance with the needs of vulnerable population groups. In the era of growing public health challenges, nursing as a profession has a significant potential for the creation of changes in this field, primarily based on frequent contacts of nurses with the users of health care, which makes them the best positioned health professionals regarding the possibility of providing support for adopting healthy lifestyles in the community. Given the doctrinal multidimensional view of health, professional work in public health nursing is based on the application of theoretical knowledge, health care based on evidence and devotion to achieving the equality of all members of the community regarding the possibility of maintenance and improvement of health. On the other hand, knowledge of the clinical health care in combination with knowledge in the field of public health and social-humanist sciences, enable nurses to be on the positions of successful leaders in public health domain (23, 24). Basic professional competences of nurses in the field of public health include:

- assessment of state aimed at identification and solving of health problems in the community,
- noticing problems and establishing the nursing diagnosis in case of the appearance of health disorders and health catastrophes in the community,
- application of health-educational interventions, informing and enabling the community to preserve and improve health,
- establishing the partner relationships and motivation of community for the active participation in identifying and solving the actual and potential health problems,
- developing professional policies and plans which support the efforts of individuals and community in health maintenance and improvement,
- application of laws and other legal regulations that protect health and ensure safety,
- providing the availability of health care and delivering health services if they are not accessible,
- securing the necessary number of competent nurses, specialists in public health,
- evaluation of efficiency, availability and quality of applied health care services in individuals and community and
- research aimed at reaching new knowledge and innovative methods for solving health problems (25).

In the contemporary system of health care, public health nursing strives to improve health outcomes of all population groups in the community, by recognizing the complexity of public health problems and contextual nature of health, based on historical, cultural, physical, mental, social and environmental factors. The doctrine of health care in public health demands logical system-level thinking, aimed at the objective observation and evaluation of state, determination of needs for health care, as well as the assessment of possibilities and (in)equalities of individuals, families or community, with the aim of taking on the activities which would transform the collected information about health into public well-being (26). Key aspects of professional activities of nurses in public health include: focus on health needs of the whole population, including the assessment of potential discrimination and specific needs of marginalized population groups, the assessment of the health condition of the population with the help of the comprehensive, holistic-centered, systematic approach to health, preventive activities in the population with the accent placed on primordial prevention, and the application of interventions of health care at all levels – in individuals, families, whole community, including all the factors that may influence, or which have already had influence on their health,

obuhvatne procene zdravlja usmerene na sva tri aspekta zdravlja celokupne populacije. U SAD je, 2010. godine, usvojen jedan od najznačajnih dokumenata pod nazivom Zakon o zaštiti pacijenata i pristupačnoj nezi (engl. *Patient Protection and Affordable Care Act*), koji uređuje sistem ostvarivanja zdravstvene zaštite u toj zemlji, i u velikoj meri upućuje na nove uloge i odgovornosti koje profesija sestrinstva treba da preuzme u oblasti javnog zdravlja: aktivan doprinos eliminaciji socijalnih razlika u pogledu pristupačnosti zdravstvenih usluga, smanjenje troškova zdravstvene zaštite i, konačno, primenu efikasnih aktivnosti u globalnom unapređenju zdravlja zajednice. Veština brze procene zdravlja i zdravstvenih rizika, kao i usmerenost ka primordijalnoj prevenciji, u ovom dokumentu su prepoznate kao važno oruđe medicinskih sestara za postizanje pomenutih ciljeva (23).

Medicinske sestre specijalisti javnog zdravlja su danas u svetu članovi ili uspešni lideri interprofesionalnih timova u različitim vrstama državnih zdravstvenih agencija i organizacija, na svim nivoima vlasti, nevladinim i humanitarnim društvenim organizacijama, fondacijama, akademskim institucijama i brojnim istraživačkim centrima (23,27). Sa jedinstvenim profesionalnim fokusom, koji istovremeno može biti usmeren na pojedinca i porodicu, ili sistem i zajednicu, sestrinstvo kao profesija koja značajno participira u oblasti javnog zdravlja u svetu, izuzetno je povoljno pozicionirana za aktivan doprinos pozitivnim promenama u organizaciji integrisanog sistema zdravstvene zaštite, odgovarajući na taj način socijalnim zahtevima i potrebi za integracijom zdravstvene zaštite u savremenom društvu.

Zaključak

Od prethodne pasivne, inicijalno pomagačke, do današnjeg statusa autonomne profesije koja aktivno doprinosi efikasnosti i razvoju svih sektora integrisanog zdravstvenog sistema, sestrinstvo se tokom svog istorijskog razvoja neprestano suočavalo sa brojnim profesionalnim i socijalnim izazovima. Uvek iznova težilo se da odgovori aktuelnim potrebama društva, ali i da aktuelne izazove i uloge usmeri ka razvoju i unapređenju sopstvene profesije i njenog društvenog ugleda. Sagledavši način života savremenog čoveka, globalne zdravstvene rizike, socijalnu nejednakost u pogledu pristupačnosti zdravstvene zaštite i opšte stanje zdravlja u svetu, WHO je u više navrata ukazivala na nužnost promena u postojećoj organizaciji zdravstvenih sistema i sveobuhvatnom usmeravanju savremene zdravstvene zaštite ka potrebama pojedinaca i zajednice u celini. Imajući u vidu upravo holističku nastrojenost zdravstvene nege kao naučne discipline i činjenicu da je najbrojnija zdravstvena profesija, sestrinstvo je u mnogim državama sveta dobilo jednu od ključnih uloga u reformi i integraciji sistema zdravstvene zaštite, naročito u oblasti javnog zdravlja. Upravo u pomenutim okvirima profesionalno delovanje medicinskih sestara pokazalo je značajan potencijal i mogućnost za ostvarivanje liderske uloge u osnaživanju zdravstvenih resursa zajednice, zaštiti životne sredine i postizanju socijalne pravde. Medicinska sestra tome doprinosi pre svega objektivnim i neposrednim uticajem na sve dimenzije zdravlja populacije, istraživanjem i primenom savremenih koncepata promocije zdravlja u zajednici, ali i aktivnom participacijom u kreiranju zvanične javnozdravstvene politike.

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needs, possibilities or inequalities in health (25). In addition, in public health the nursing profession is expected to establish and maintain the relation of active cooperation with the community, and to continuously participate in the education for the health of its members and development of local health policies that would be adjusted to the needs of certain community. It is also a response to the selected priorities which originate from the continuous, comprehensive assessment of health directed to all three aspects of health of the whole population. In the USA, one of the most significant documents under the title Patient Protection and Affordable Care Act was adopted in 2010, and it regulates the system of health care in that country, and to the great extent, it points to the new roles and responsibilities that the nursing profession has to take on in the domain of public health: active contribution to the elimination of social differences regarding the availability of health care services, reduction of health care costs, and finally, the application of efficient activities in the global improvement of health of the community. The skill of the quick assessment of health and health risks, as well as the orientation towards primordial prevention have been recognized in this document as an important tool for the achievement of the above mentioned aims (23).

Today nurses who have specialized in public health are members or successful leaders of interprofessional teams in different state health agencies and organizations of the world, at all levels of authority, in nongovernmental social organizations and charities, foundations, academic institutions and numerous research centers (23,27). With a unique professional focus that can be directed at the individual and family, or the system and community, nursing as a profession, which significantly participates in the public health domain in the world, is extremely well-positioned to actively contribute to positive changes in the organization of the integrative health care system, thus responding to the social demands and to the need for the integration of health care in the contemporary society.

Conclusion

During its historical development, from the previously passive and helping profession until the current status of autonomous profession that actively contributes to the efficiency and development of all sectors of integrated health system, nursing has incessantly faced with the numerous professional and social challenges. Nursing has always been striving to respond to the actual needs of society, and to direct the actual challenges and roles at the development and promotion of profession and its social reputation. Considering the lifestyle of modern people, global health risks, social inequality in terms of availability of health care and the general state of health worldwide, the WHO has pointed to the necessity of changes in the existing organization of health care systems and the comprehensive orientation of contemporary health care towards the needs of individuals and community as a whole. Given the holistic disposition of health care as a scientific discipline and the fact that this profession is the most numerous, nursing has been given one of the key roles in the reform and integration of health care systems in many countries, especially in the field of public health. Precisely within this framework, nurses' professional activities have showed a significant potential and the possibility of fulfilling leadership roles in strengthening the health resources of the community, the protection of environment and reaching the social justice. Thus, a nurse makes a contribution, first of all, by influencing all aspects of population health, by investigating and applying the modern concepts of the promotion of health in the community, as well as by participating actively in creating the official public health policy.

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