



PRAXIS MEDICA

Medicinski fakultet Univerziteta u Prištini
Kosovska Mitrovica



KNJIGA SAŽETAKA

“Drugi kongres lekara Kosova i Metohije”
u susret Vidovdanu

Jun 2025. Kosovska Mitrovica



3/2025

**DRUGI KONGRES LEKARA KOSOVA I METOHIJE
“U SUSRET VIDOVDANU”**

JUN 2025. KOSOVSKA MITROVICA

KNJIGA SAŽETAKA

IZDAVAČ

**MEDICINSKI FAKULTETET UNIVERZITETA U PRIŠTINI
SA PRIVREMENIM SEDIŠTEM U KOSOVSKOJ MITROVICI**

ZA IZDAVAČA

Prof. dr Tatjana Novaković, dekan

UREDNIK

Prof. dr Bojana Kisić

ISBN IZADAVČKE CELINE 978-86-81824-46-7

ISBN IZDANJA 978-86-81824-44-3

ŠTAMPA

SVEN Niš

Tiraž

50 primeraka

Medicinski fakultet Univerziteta u Prištini
Kosovska Mitrovica

KNJIGA SAŽETAKA

“Drugi kongres lekara Kosova i Metohije”
u susret Vidovdanu

Jun 2025. Kosovska Mitrovica

3/2025

ORGANIZACIONI ODBOR

Predsednik

Prof. dr Tatjana Novaković, dekan

1. Prof. dr Zdravko Vitošević
2. Prof. dr Branko Mihailović
3. Prof. dr Bratislav Lazić
4. Prof. dr Ljiljana Popović
5. Prof. dr Nenad Milošević
6. Prof. dr Dragoslav Lazić
7. Prof. dr Momir Dunjić
8. Prof. dr Aleksandar Jovanović
9. Prof. dr Slaviša Stanišić
10. Prof. dr Milan Filipović
11. Prof. dr Jelena Todić
12. Prof. dr Momčilo Miroković
13. Prof. dr Mirjana Stojanović Tasić
14. Prof. dr Slađana Savić
15. Prof. dr Tatjana Filipović
16. Prof. dr Slađana Trpković
17. Prof. dr Lepša Žorić
18. Prof. dr Danijela Ilić
19. Prof. dr Dragan Marjanović
20. Prof. dr Brankica Martinović
21. Prof. dr Zoran Vlahović
22. Prof. dr Saša Tabaković
23. Prof. dr Božidar Odalović
24. Prof. dr Dejan Tabaković
25. Prof. dr Aleksandar Božović
26. Prof. dr Snežana Jovanović
27. Prof. dr Tanja Rajković
28. Prof. dr Amila Vujačić
29. Dr Boban Biševac

NAUČNI ODBOR

Predsednik

Prof. dr Aleksandar Pavlović

1. Prof. dr Tatjana Simić
2. Prof. dr Lazar Davidović
3. Akademik prof. dr Branko Beleslin
4. Prof. dr Ranko Škrbić
5. Prof. dr Dejan Bakonjić
6. Prof. dr Snežana Brkić
7. Prof. dr Vladimir Injić
8. Prof. dr Dobrila Stanković Đorđević
9. Prof. dr Aleksanda Mitić
10. Prof. dr Miodrag Radunović
11. Prof. dr Aleksa Marković
12. Prof. dr Sonja Marjanović
13. Prof. dr Tomisla Đokić
14. Prof. dr Vladimir Jakovljević
15. Prof. dr Elek Zlatan
16. Prof. dr Jasna Pavlović
17. Prof. dr Nevenka Kalezić
18. Prof. dr Zran Lazić
19. Prof. dr Vaska Vandevska, Radunović
20. Prof. dr Maja Ercegovac
21. Prof. dr Nedeljka Ivković
22. Prof. dr Julijana Radojčić
23. Prof. dr Ivica Lalić
24. Prof. dr Aleksanda Čorac
25. Prof. dr Milica Mijović
26. Prof. dr Aleksandra Ilić
27. Prof. dr Marija Milić
28. Prof. dr Snežana Janićijević Hudomal
29. Prof. dr Dijana Mirić
30. Prof. dr Bojana Kisić
31. Prof. dr Ljiljana Šulović
32. Prof. dr Nataša Katanić
33. Prof. dr Biljana Krdžić
34. Prof. dr Vladan Perić
35. Prof. dr Sonja Smiljić
36. Prof. dr Julijana Rašić
37. Prof. dr Snežana Hadžistević
38. Prof. dr Vladimir Matvijenko
39. Prof. dr Andrijana Cvetković

Uz podršku Ministarstva nauke, tehnološkog razvoja i inovacija



Република Србија

МИНИСТАРСТВО НАУКЕ,
ТЕХНОЛОШКОГ РАЗВОЈА И ИНОВАЦИЈА

Sponzor



UVODNA REČ

Poštovane kolegice i kolege, učesnici Drugog Kongresa lekara Kosova i Metohije

Pred vama je Zbornik radova Drugog kongresa lekara Kosova i Metohije, međunarodnog kongresa u organizaciji Medicinskog fakulteta Univerziteta u Prištini - Kosovska Mitrovica, koji je održan od 13 -15. juna 2025. godine u Kosovskoj Mitrovici. Drugi kongres lekara Kosova i Metohije je najveći međunarodni medicinski naučni skup u poslednjih trideset godina na prostorima Kosova i Metohije.

Kada smo 2019. godine održali Prvi kongres lekara Kosova i Metohije, obećali smo da će to postati tradicija našeg fakulteta. Međutim, poznata dešavanja na Kosovu i Metohiji su delom poremetila naše planove. Danas, šest godina kasnije, ponosno i dostojanstveno, ispunjavamo naše obećanje. Kongres je okupio preko 100 plenarnih predavača i preko 60 oralnih prezentera. Takođe u danima kongresa su održana i četiri pretkongresna stručna skupa - radionice koji su posebno akreditovani.

Na Drugom Kongresu lekara Kosova i Metohije je održan i okrugli sto pod nazivom "Neurologija na Kosovu i Metohiji - gde smo sada i kakva je budućnost" koji okuplja eminentne neurologe, rukovodioce neuroloških klinika, specijalnih bolnica i odeljenja u Republici Srbiji, čiji je cilj utvrđivanje glavnih problema u funkcionisanju neuroloških službi na Kosovu i Metohiji i pravljenje plana za otklanjanje istih. Na okruglom stolu je doneta deklaracija o sveobuhvatnoj podršci razvoju neurologije na ovim prostorima.

Naučni deo kongresa se sastojao od šest plenarnih sesija koje su obuhvatile gotovo sve grane medicine i stomatologije.

Prva, pretklinička sesija pod nazivom "Moć bazičnih nauka kao osnova medicinskih znanja" bila je posvećena bazičnim biomedicinskim istraživanjima i specifičnostima u okviru morfoloških i funkcijskih pretkliničkih grana, kao i njihovom uticaju na unapređenje dijagnostičkih i terapijskih procedura. Sesija je bila podeljena u dva dela, sa ukupno 16 predavača. Predavanja su bila sa aktuelnom tematikom i zanimljivim prezentacijama. Učesnici su iskazali svoju zainteresovanost kroz aktivno postavljanje pitanja i učešće u diskusiji koja je sledila. Na kraju sesije svi učesnici (predavači i pasivni učesnici) su iskazali svoje zadovoljstvo prikazanim sadržajem i mogućnošću da u aktivnoj interakciji razmene iskustva/dobiju odgovore u oblasti svog interesovanja.

U okviru Drugog kongresa lekara Kosova i Metohije održana je i sesija iz oblasti preventivne medicine, koja je okupila ukupno 28 izlagača - 19 plenarnih predavača i 9 autora oralnih prezentacija. Sesija se bavila zdravstvenim rizicima budućnosti. Ova sesija je omogućila razmenu novih, značajnih informacija u vezi sa organizacijom i vođenjem zdravstvene politike i sistema, zdravstvenim rizicima na radnom mestu, kretanjem zaraznih bolesti i novih trendova imunizacije, značajem nacionalne "vakcinalne nezavisnosti", antimikrobnom rezistencijom, zloupotrebom supstanci, trendovima kardiovaskularnih i malignih bolesti, kao i problemima ishrane. Teme izlaganja bile su fokusirane na aktuelne izazove u oblasti javnog zdravlja, sa posebnim osvrtom na: porast učestalosti hroničnih nezaraznih bolesti i identifikaciju glavnih faktora rizika koji doprinose njihovom nastanku; značaj ishrane u prevenciji i terapiji hroničnih oboljenja; sve češću pojavu i širenje infekcija HPV virusom među studentskom populacijom; problem porasta broja obolelih od tuberkuloze; očuvanje i unapređenje reproduktivnog zdravlja. Prikazani radovi i razmena znanja značajno doprinose razvoju javnozdravstvene prakse u regionu.

Posebna, klinička sesija je obuhvatila predavanja iz različitih oblasti kliničke medicine. Prvi deo sesije je bio posvećen internističkim granama medicine. U ovoj sesiji su prikazane aktuelnosti i dileme u dijagnostici i lečenju hroničnog koronarnog sindroma, kao i novi izazovi u prevenciji kardiovaskularnih bolesti. Takođe su prikazana i interesantna izlaganja na temu srčane slabosti i urođenih srčanih mana. Na ove teme su se nadovezala predavanja iz neurologije: neuropatski bol, etiologija i terapija neurorazvojnih poremećaja, kako i novosti u sekundarnoj profilaksi infarkta mozga antiagregacionom terapijom. Ovaj deo sesije je završen plenarnim predavanjima iz oblasti pulmologije i pneumofiziologije. Drugi deo sesije je bio posvećen istorijskim razvojem medicine u Srbiji: Istorijskim razvojem SLD-a od 1872. god do danas, razvoju porodiljske u Srbiji, kao i razvoju plastične hirurgije u Srbiji. U ovom delu sesije su obrađene različite aktuelne teme: metabolički sindrom; uticaj komercijalnih letova avionom na akutne i hronične bolesti putnika; razlike i sličnosti između konvencionalne i integrativne medicine. Treći deo kliničke sesije je bio posvećen interesantnim temama iz oblasti hirurgije i intenzivne terapije: od razvoja plastične hirurgije u Srbiji, preko hirurgije štitaste žlezde i feohromocitoma, do interesantnih tema iz ortopedije. Sesija je završena aktuelnim saznanjima o septičnom šoku i terapiji kisoenikom visokog protoka.

U stomatološkoj sesiji se potvrdio značaj prevencije, ali i da se već narušeno oralno zdravlje može efikasno lečiti uz savremene dijagnostičke i terapijske metode. U drugom delu sesije, predstavljena su najnovija znanja i dostignuća u rešavanju stomatoloških oboljenja, sa posebnim osvrtom na estetska očekivanja i zahteva pacijenata. U tom cilju značajan deo predavanja je posvećen primeni digitalne stomatologije u dijagnostici, planiranju, ali i nekim fazama stomatološke terapije.

Sesija "Novi modeli u edukaciji u medicini - razvoj i implementacija metakognitivnih problemski baziranih modula u medicinskim naukama" ima za cilj da prikažu rezultate istoimenog Erasmus plus projekta i drugih edukativnih rešenja koja se koriste za unapređenje obrazovanja lekara, uz korišćenje konceptualnih, proceduralnih i metakognitivnih znanja. Teme u ovoj sesiji obrađuju metode koje upotpunjuju tradicionalni način učenja sa primenom digitalnih alata, kao što su multimedijalni pristupi, simulacija, primena veštačke inteligencije i virtuelnih okruženja, a sve u cilju unapređenja obrazovnog procesa.

Organizacija i realizacija Drugog Kongresa lekara Kosova i Metohije je bio veliki i odgovorni zadatak ne samo u naučnom i stručnom smislu, nego i u pogledu bezbednosti i sigurnosti učesnika kongresa. Naš kongres je imao i duboko simbolični značaj za sve one koji veruju u snagu znanja, zajedništva i kontinuiteta struke, uprkos brojnim izazovima.

Zahvaljujemo se Ministarstvu nauke, tehnološkog razvoja i inovacija, kao i Kancelariji za Kosovo i Metohiju za svu pomoć oko organizacije i realizacije Drugog Kongresa lekara Kosova i Metohije

Posebno se zahvaljujemo učesnicima Kongresa koji žive van Kosova i Metohije, jer su svojim dolaskom pokazali da pored ljubavi prema medicini i nauci, poseduju i nešto mnogo uzvišenije, a to je ljubav prema srpskom narodu na ovim prostorima.

Svim učesnicima Kongresa želimo da sa Drugog kongresa lekara Kosova i Metohije ponesu uspomene ne samo na nova znanja i iskustva, već i na lepa poznanstva i prijateljstva.

Do sledećeg susreta,

U Kosovskoj Mitrovici, 15 juna 2025. god.

Prof. dr Aleksandar Pavlović
Predsednik naučnog odbora Kongresa

Prof. dr Tatjana Novaković, dekan
Predsednik organizacionog odbora Kongresa

PREVENTIVNA MEDICINA

SADRŽAJ

• PERCEPCIJA RIZIKA OD RAKA STUDENATA MEDICINE: FOKUS NA RAK GRLIČA MATERICE - NATAŠA RANČIĆ	10
• UTICAJ ISHRANE NA PREVALENCIJU HRONIČNIH NEZARAZNIH BOLESTI	
U CRNOJ GORI - SNEŽANA BARJAKTAROVIĆ LABOVIĆ	16
• ELIMINACIJA TUBERKULOZE - DOSTIGNUĆA I IZAZOVI - MAJA STOŠIĆ	21
• IZAZOVI JEDNOG ZDRAVLJA U ZDRAVSTVENIM POLITIKAMA - VESNA BJEGOVIĆ-MIKANOVIĆ	23
• ZNAČAJ NACIONALNE „VAKCINALNE NEZAVISNOSTI“ - DARIJA KISIĆ	24
• NEJEDNAKOSTI U ZDRAVLJU KROZ PRIZMU NEOSTVARENIH ZDRAVSTVENIH POTREBA STARIH	25
• RAZVOJ LIDERSTVA ZA TRENERE JAVNOG ZDRAVLJA U MEGHALAJI, INDIJA - ANALIZA	
POTREBA ZA OBUKOM - DIPIKA BUMB	26
• COVID-19 I KARDIOVASKULARNE BOLESTI - BILJANA MIJOVIĆ	27
• KAKO JE COVID-19 PROMENIO MAPU ANTIMIKROBNE REZISTENCIJE U CRNOJ GORI - GORDANA MIJOVIĆ	28
• AKTUELNI IZAZOVI U ODRŽAVANJU REPRODUKTIVNOG ZDRAVLJA ŽENA - JELENA DOTLIĆ	29
• HEMSEKS I ŽIVOT SA HIVOM - BRATISLAV PROKIĆ	30
• EPIDEMIOLOŠKE KARAKTERISTIKE HEMORAGIJSKE GROZNICE SA BUBREŽNIM	
SINDROMOM U CRNOJ GORI OD 2014-2023. - BOŽIDARKA RAKOČEVIĆ	31
• REGISTROVANE VEKTORSKE ZARAZNE BOLESTI U CRNOJ GORI 2014-2023. -ISKUSTVA	
PRISTUPU JEDNOM ZDRAVLJU - SANJA MEDENICA.....	32
• PREVALENCIA HEPATITIS B I C VIRUSA U POPULACIJI DOBROVOLJNIH	
DAVAOČA KRV I - ANDRIJANA KARANOVIĆ	33
• PROCENA ZDRAVLJA I ZDRAVSTVENIH POTREBA ODRAŠLE POPULACIJE NA KOSOVU I METOHIJI - JOVANA MILOŠEVIĆ	34
• PROCENA RIZIKA RADNIH MESTA U ZDRAVSTVENIM USTANOVAMA: TEORIJSKI OKVIR	
I METODOLOŠKI PRISTUPI - MILOVOJE GALJAK	35
• METABOLIČKI SINDROM I ISHRANA U STUDENTSKOJ POPULACIJI - DANIJELA ILIĆ.....	36
• DISTRIBUCIJA VEKTORA U SVETLU GLOBALNIH KLIMATSKIH PROMENA - JOVAN MALINIĆ	37
• REZULTATI SEROEPIDEMIOLOŠKOG ISTRAŽIVANJA KRPELJSKOG ENCEFALITISA U HUMANJOJ	
POPULACIJI AP VOJVODINE - TATJANA PUSTAHIIJA.....	38
• SLUČAJ OBOLJEVANJA OD MORBILA U OPŠTINI BAR 2024.GODINE - IGOR GALIĆ	39
• KAKO POVEĆATI PROCENAT PRAVOVREMENO VAKCINISANE DECE MMR VAKCINOM U NOVOM PAZARU?	
RAD NA POLJU PODIZANJA NIVOA ZDRAVSTVENE PROSVEĆENOSTI STANOVNIŠTVA - ŠEFADIL SPAHIĆ	40
• ZNANJE STUDENTKINJA NIŠKOG UNIVERZITETA U VEZI POSTOJANJA POLNOPRENOSIVIH INFEKCIJA	
KAO FAKTORA RIZIKA U NASTANKU RAKA GRLIČA MATERICE - MIRKO ILIĆ	41
• ZASTUPLJENOST MALIGNIH BOLESTI KOD STANOVNIKA U SRPSKIM SREDINAMA NA	
KOSOVU I METOHIJI - SLAĐANA ĐURIĆ.....	42
• UTICAJ PANDEMJE COVID-19 NA POTROŠNJU ANTIDIJABETIKA U SRBIJI: JOINPOINT	
ANALIZA TRENDI - JELENA FILIMONOVIĆ	43
• POTREBA I ZNAČAJ MOLITVE I LJUBAVI ZA PSIHOFIZIČKI BALANS DETEKTOVANO KVANTNOM	
DIJAGNOSTIKOM - MILICA BURAZOR	44
• JAVNOZDRAVSTVENI ZNAČAJ POVREDA KOD DECE PUTNIKA U VOZILU - MIRJANA ŠTRBAC	45
• PRIMENA KONCEPTA MKPB MODULA ZA SPROVOĐENJE TRANSDISCIPLINARNOG NAUČNOG PRISTUPA	
U POSLEDIPLOMSKOM MEDICINSKOM OBRAZOVANJU - ALEKSANDAR ČORAC.....	46
DEPRESIJA, ANKSIOZNOST I STRES U STUDENSKOJ POPULACIJI - ELMA SELIMI	47
• ZDRAVSTVENE KARAKTERISTIKE FLAŠIRANE VODE U MALOPRODAJNIM OBJEKTIMA	
U KOSOVSKOJ MITROVICI - IVANA MITROVIĆ	48
• UPOTREBA DRUŠTVENIH MREŽA I INTERNET PLATFORMI U CILJU UNAPREĐENJA	
UČENJA STUDENATA MEDICINE - JELENA CVETKOVIĆ.....	49
• UPOTREBA ALKOHOLA I DRUGIH PSIHOAKTIVNIH SUPSTANCI MEĐU UČENICIMA SREDNJIH ŠKOLA	50
• POVEZANOST KORIŠĆENJA MOBILNOG TELEFONA SA KVALITETOM SNA KOD STUDENATA - TIMA LIČINA	51
• GLJIVIČNE INFEKCIJE KOD IMUNODEFICIJENTNIH PACIJENATA	52

PERCEPCIJA RIZIKA OD RAKA STUDENATA MEDICINE: FOKUS NA RAK GRLIĆA MATERICE

PERCEPTION OF CANCER RISK AMONG MEDICAL STUDENTS: CERVICAL CANCER IN FOCUS

Rančić K. Nataša^{1,2}, Ilić V. Mirko²

1 Univerzitet u Nišu, Medicinski fakultet Niš, Srbija

2 Institut za javno zdravlje Niš, Srbija

SAŽETAK

Uvod. Rak grlića materice predstavlja značajan globalni javno zdravstveni problem i zauzima četvrto mesto po učestalosti među karcinomima kod žena. Cilj rada bio je da istraži percepciju studenata medicine o faktorima rizika za rak grlića materice, kao prema infekciji Humanim papilloma virusom (HPV) i informisanost o HPV vakcini. Materijal i metode. Sprovedena je studija preseka kojom su bili obuhvaćeni studenti četvrte, pete i šeste godine Integrisanih Akademskih Studija (IAS) medicine Medicinskog fakulteta Univerziteta u Nišu. Primnjen je anonimni upitnik koji je distribuiran preko Google platforme. Rezultati. U istraživanju je učestvovao ukupno 361 student (21% muškog i 79% ženskog pola). Prosečan broj poena na testu znanja o raku grlića materice iznosio je 17.25 ± 7.92 (min 0-max 30). Srednjoškolsko obrazovanje studenata imalo je značajan uticaj na znanje o faktorima rizika za rak grlića ($p < 0.001$), kao i mesto stalnog prebivališta. Značajno viši skor znanja imali su studenti iz gradske sredine ($p = 0.01$); studenti čije su majke imale srednje ($p = 0.002$) ili visoko obrazovanje imali su značajno bolje znanje ($p < 0.001$) od onih čije su majke imale osnovno obrazovanje, kao i studenti čiji su očevi imali visoko obrazovanje ($p < 0.05$) u odnosu na očeve srednjeg obrazovanja. Studenti koji su bili srednjeg i visokog imovinskog stanja imali su značajno viši skor znanja ($p = 0.008$) od studenata koji su bili niskog imovinskog stanja. Svi studenti koji su završili srednju školu medicinske struke imali su značajno bolje znanje o HPV infekciji od studenata koji su završili gimnaziju ($p < 0.001$) i škole nemedicinske struke ($p < 0.001$). Studenti koji su bili u partnerskoj vezi ($p = 0.005$) i oni koji su bili seksualno aktivni ($p = 0.001$) imali su značajno bolje znanje o HPV infekciji. Samo 25.5% studenata bilo je svesno značaja HPV vakcinacije u prevenciji raka grlića materice i 16.0% znalo je nešto o HPV vakcini. Visoko obrazovanje majke ($p = 0.028$), partnerska veza ($p = 0.041$) i seksualna aktivnost ($p = 0.001$) bili su značajno povezani sa višim nivoom znanja o HPV infekciji. Zaključak. Istraživanje je pokazalo zadovoljavajući da studenti imaju zadovoljavajući nivo znanja o raku grlića materice, ali je svest o riziku od HPV infekcije i raka grlića materice kao i o prevenciji bila je relativno niska.

Ključne reči: rak grlića materice, faktori rizika, studenti medicine, HPV infekcija, prevencija

ABSTRACT

Perception of cancer risk among medical students: cervical cancer in focus

Introduction. Cervical cancer remains a significant global public health concern, ranking as the fourth most common cancer among women. This paper explores students' perceptions of risk factors for cervical cancer, as well as their awareness of human papillomavirus (HPV) infection and the HPV vaccine. Materials and Methods. A cross-sectional, questionnaire-based study was conducted among medical students at the Faculty of Medicine, University of Niš, using the Google Forms platform. Results. A total of 361 students participated in the study and the average cervical cancer knowledge score was 17.25 ± 7.92 (range: 0-30). Pre-college education had a significant impact on the knowledge score ($p < 0.001$). A significant difference was also found between students from urban and rural areas ($p = 0.01$). Parental education level significantly influenced students' knowledge: both mother's ($p < 0.001$) and father's ($p = 0.006$) education were associated with higher knowledge scores. Students whose mothers had a medium ($p = 0.002$) or high ($p < 0.001$) level of education scored significantly higher than those whose mothers had a low level of education. Income status was another factor significantly associated with knowledge scores ($p = 0.008$), as was relationship status—students in a relationship demonstrated higher knowledge than those who were single ($p = 0.019$). Knowledge of HPV infection varied significantly depending on the type of pre-college education ($p < 0.001$); students in a relationship ($p = 0.005$) and those who were sexually active ($p = 0.001$) were more likely to be aware of HPV infection. Conclusions. The present study revealed sufficient knowledge about cervical cancer in examined population, but awareness about HPV infection was rather low.

Key words: cervical cancer, risk factors, medical students, HPV infection, prevention

1. INTRODUCTION

Cervical cancer is the fourth most common cancer in female population with 660,000 new cases and 350,000 deaths worldwide in 2022 [1]. Nearly half of all newly registered cases in 2022—approximately 117,944—were recorded in sub-Saharan Africa, including 10,532 in South Africa, 6,938 in Uganda, 10,868 in Tanzania, 13,676 in Nigeria, and 8,168 in Ethiopia [2]. This cancer is the leading cause of cancer death mainly in sub-Saharan Africa as well as South America and South-Eastern Asia. The majority of the burden of the disease occurs in low and middle-income countries (LMICs) [2,3]. Incidence and mortality rates vary at least 10-fold, with the highest regional incidence and mortality rates found in sub-Saharan Africa and Melanesia and the lowest rates found in Northern America, Australia/New Zealand, and Western Asia [4].

In Europe, cervical cancer causes 58 219 new cases and 26 950 deaths in 2022, which makes it the ninth most common cause of female cancer, and when it comes to cancer deaths, it is ranked 11th [5]. However, it is ranked second in both incidence and mortality among females between 15 and 44 years of age [6]. The trend of peak incidence occurring at younger ages, consistently observed over the past several decades [6,7], suggests that cervical cancer is an age-related disease, primarily affecting women of reproductive age. This cancer progresses slowly [8], and when detected in its early stages, it is highly treatable, with a 5-year relative survival rate of up to 92% [9].

Besides, it is the first cancer to have an identified agent essential for its development, human papillomavirus (HPV) infection. In the 1970s, zur Hausen suggested a possible association between HPV infection and cervical cancer [10], which was confirmed in the following decades. HPV is a necessary, but not sufficient, cause of cervical cancer [11]. In the most recent evaluation by the IARC Monographs, seventeen HPV genotypes have been identified as causally linked to invasive cervical cancer, although their carcinogenic potency varies significantly [12]. HPV types 16 and 18 are responsible for approximately three-quarters of cervical cancer cases globally [13]. Additional types, such as HPV 31, 33, 45, 52, and 58, account for 15-20% of cases. The remaining 10 causal genotypes contribute to only about 5% of cases worldwide, with notable regional differences—such as a higher prevalence (~4%) of HPV 35 in Africa compared to other regions [12] and were classified as group 1 carcinogens by the IARC Monographs [13]. Several types have been recognized as high risk according to their oncogenic potential, with types 16 and 18 being the most prevalent ones [14]. Findings from the first study of HPV infection prevalence in Serbian women [15,16] showed that in Serbia, an 1060 new cases in female population were diagnosed with cervical cancer in 2022 and 404 women died from it [17]. Among them, several types have been recognized as high risk according to their oncogenic potential, with types 16 and 18 being the most prevalent ones [8]. Findings from the first study of HPV infection prevalence in Serbian women [15] showed that nearly one third of HPV-positive women in Serbia had types HPV16/18, marked as the most aggressive high-risk genotypes of human papillomavirus HR-HPVs. According to the findings of Kovacevic [16], the most prevalent HPV types in females of the Autonomous

Province of Vojvodina, in Serbia, are: HPV 16; HPV 31, HPV 51; HPV 33; HPV 18; HPV 52; HPV 56; HPV 39; HPV 45; HPV 58; HPV 59 and HPV 35 and the most frequent HPV types are type 16 and type 31. The most prevalent HPV types of this region showed concordance with European isolates, but non-European variants were also found [15,16]. Infection with high-risk oncogenic human papillomavirus (HPV) has been established as the cause of cervical cancer [16]. While HPV infection resolves in most individuals, in others it progresses to cancer. This has led to a search for co-factors that promote persistent high-risk HPV infection, which is cardinal in the carcinogenesis of cervical cancer [17]. High parity, long-term use of oral contraceptives, cigarette smoking, overweight, obesity, physical inactivity, and immune suppression have been associated with increased progression to cervical cancer [18,19,20]. As the cause and associated risk factors of HPV have been established, various methods of prevention have also been proposed. HPV vaccination has been suggested for young adolescents who are yet to be sexually active, along with screening for precancerous lesions in women within the target age group. However, HPV vaccines, which are vaccines for sexually transmitted infections (STIs), may face acceptance and marketing challenges in certain settings [21].

2. MATERIAL AND METHOD

2.1. Study Design

The cross-sectional study was conducted from 15 October 2024 to 15 November 2024 via the Google Platform. The participants were male and female medical students in their fourth-year, fifth-year and sixth year of the study.

2.2. Instrument of investigation

Data were collected using a semi-structured questionnaire specially created for this investigation. It was a self-administered questionnaire with three distinct three sections.

The first section explored respondents' socio-demographic characteristics, including age, type of faculty, mother's and father's education level, place of residence, type of secondary school completed and financial and relationship status. In addition, participants were asked if they ever had sexual intercourse and, if yes, how many sexual partners they had had.

The second section consisted of 22 items divided into three subsections (knowledge about risk factors for cervical cancer, HPV awareness, HPV vaccination awareness). Cervical cancer knowledge was evaluated by a composite score estimated using a total of 18 items regarding risk and protective factors, preventive measures and the outcome of cervical cancer. Participants had three possible response options regarding proposed factors (protective factor, risk factor and do not know) and correct answers were coded with either one or two points, deepening factor significance. As for the rest of the questions, the given options were "true", "false" and "do not know" and correct answers were given two points. The total number of points represented the participant's cervical cancer knowledge score (CC-KS), with higher scores meaning better knowledge. The maximum number of points was 30. All questions were based on data from the relevant literature and information provided by the American Cancer Society [18]. Awareness about HPV was determined based on whether or not participants had heard about HPV infection. The remaining three items were related to HPV vaccination. Participants were asked to indicate if they have heard about the HPV vaccine. If the answer was positive, they then answered when the best time to get the HPV vaccine is and if the HPV vaccine is available in Serbia.

The last part of the questionnaire inquired about the source of respondents' knowledge about the subject. Thirteen multiple choice answers, from three categories of source (personal contact, organized health education (OHE) and media) were offered. The opportunity to declare not having any knowledge was also given.

Ethical approval for the study was obtained from the Ethics Committee of the Faculty of Medicine in Nis (Decision No. 12-8310-1/2-4, dated 10 July 2024).

2.3. Statistical Analysis

Data were presented as the mean and standard deviation (SD) or as frequencies and proportions. Comparison of the mean values between two groups was done using t-tests or Mann-Whitney tests depending on data distribution, while mean values between the three groups were compared using either ANOVA or Kruskal-Wallis tests. The chi-squared test was used for the comparison of categorical variables. The Chi-squared test was used for comparison of categorical variables. The p-value was set at $p < 0.05$ (two-tailed). All statistical analyses were performed using R software, version 3.0.3 [23].

3. RESULTS

3.1. A total of 361 participants completed the entire questionnaire. The average age of the study population was 22.7 ± 1.3 years. The majority of respondents were female students (79%) compared to male students (21%). Most participants came from urban areas (75.7%). A total of 95% had mothers with either a medium or high level of education, while 62.9% had fathers with the same level of education. Regarding socioeconomic status, 70.2% reported having a medium or high income. In terms of relationship status, 44.9% were in a relationship, while 55.1% were single.

3.2. Perception risk of cervical cancer

The knowledge about cervical cancer was evaluated using composite score. It was established that average score in our students was 17.25 ± 7.92 (Min 0, Max 30). Statistical analysis showed that medical students have knowledge score ($p < 0.001$). The pre-college education also significantly influenced participants' score ($p < 0.001$), with the highest score noted in students that previously attended medical high school followed by those that attended grammar schools (Table 1). Furthermore, significant difference in the score was established between participants from urban and rural areas ($p = 0.01$) with the former being better informed about cervical cancer. Mother's and father's level of education also influenced cervical cancer knowledge of our subjects ($p < 0.001$ and $p = 0.006$, respectively). The knowledge was significantly higher in students whose mothers had middle ($p = 0.002$) and high ($p < 0.001$) education compared to those with low education. Likewise, having a father with high education meant having higher score (Table 1). Income status of participants was significantly associated with knowledge score ($p = 0.008$). Thus, participants with high and middle income demonstrated higher scores (Table 1). Students in a relationship showed better knowledge than single students ($p = 0.019$). On the other hand, no significant difference was proven between women that had sexual experience and those who did not (Table 1).

Table 1. Association of participants socio-demographic characteristic with cervical cancer knowledge score

Variable	Cervical cancer knowledge score	p
Type of high school finished		<0.001
General High school	16.79±7.73	
Other, non-medical high school	14.69±7.98 ^{a,b}	
Medical high school	20.82±6.38 ^b	
Place of residence		0.010
Urban area	16.62±7.82	
Rural area	15.48±8.16	
Mother's level of education		<0.001
Low	13.33±8.27 ^{c,d}	
Middle	16.22±8.04	
High	17.02±7.53	
Father's level of education		0.006
Low	15.68±7.82	
Middle	15.78±8.09	
High	17.22±7.57 ^e	
Financial status/income		0.008
Low	14.25±8.53	
Middle	16.62±7.85 ^f	
High	16.51±7.79 ^f	
Marital/relationship status		0.019
Single	15.89±8.06	
In relationship	16.96±7.69	
Ever had sexual intercourse		0.065
Yes	16.67±7.90	
No	16.01±7.93	
Number of sexual partners *		0.537
1	16.65±7.80	
2-4	16.96±8.08	
5+	17.00±8.45	

a vs. medical high school, $p<0.05$; b vs. general high school, $p<0.05$; c vs. middle educated mother, $p<0.05$; d vs. high educated mother, $p<0.05$; e vs. middle educated father, $p<0.05$, f vs. low income, $p<0.05$; g of those that had sexual intercourse

3.3. HPV and HPV vaccine awareness

Total number of participants that have heard of HPV infection was 174 (48.0%) with medical students of fourth-, five- and six-year of study being aware of this infection. Furthermore, knowledge of this infection differed significantly depending on the type of secondary education ($p<0.001$). Thus, students that have finished medical high school had significantly higher knowledge compared to those from general high school ($p<0.001$) and non-medical high schools ($p<0.001$). Finally, students that were in relationship ($p=0.005$) and that were sexually active ($p=0.001$) knew about HPV infection significantly more often.

When it comes to HPV vaccine, the overall awareness was quite low (25.5%), whereas even lower percentage of students have heard for both HPV and its vaccine (16.1%). The statically significant difference was noted relative to mother's education, relationship and sexual status. Students raised by highly educated mothers have heard of the HPV vaccine more often (compared to students whose mothers had low education, $p=0.028$), just as the students that were in relationships (vs. single, $p=0.041$) and that had had sexual intercourse (compared to those who have not had sexual intercourse, ($p=0.001$)).

The other two questions about HPV vaccination were correctly answered by only a small number of subjects. Of those who declared that they were aware of HPV and the vaccine only 37 knew when the best time to get the HPV vaccine is and 48 knew that it is available in Serbia. No difference between distinct demographic groups was established (Table 1).

3.4. Source of information

The media was listed as the dominant source of information about the investigated topics by all of examined students. Two hundred fifty-five subjects declared having no knowledge about investigated topics.

The knowledge score was significantly higher in subjects that received information from either of three source categories compared to subjects who denied receiving information from that particular category (Table 2). A similar relationship is noted between information sources and HPV awareness. Among the students who knew about HPV, significantly more reported acquiring information through each of the source categories (vs. not acquiring information through that source). Finally, OHE was the only information source category associated with significantly higher number of subjects that have heard about HPV vaccine ($p<0.001$), that knew when it should be administered ($p=0.039$) and that it is available in Serbia ($p=0.029$).

The complete statistical analysis regarding sources of information among our participants and their relationship with cervical cancer knowledge score, HPV and HPV vaccine awareness is shown in Table 2.

Table 2. Source of information and its association with cervical cancer knowledge score, HPV and HPV vaccine awareness

Source of information	Knowledge score about cervical cancer	Heard about HPV (%)	Heard about HPV vaccine ^a (%)	Know the best time to get the HPV vaccine ^b (%)	Know that HPV vaccine is available in Serbia ^b (%)
Media					
Yes	17.38±7.52	67.5	69.0	78.4	70.8
No	14.62±8.28	32.5	31.0	21.6	29.2
p	<0.001*	<0.001***	0.628***	0.249***	0.893***
OHE ^c					
Yes	18.49±7.15	65.0	74.2	89.2	87.5
No	13.87±8.05	35.0	25.8	10.8	12.5
p	<0.001*	<0.001***	<0.001***	0.039***	0.029***
Personal contact					
Yes	18.42±6.98	37.8	41.0	45.9	41.7
No	15.31±8.16	62.2	59.0	54.1	58.3
p	<0.001**	<0.001***	0.264***	0.632***	0.922***

*Mann-Whitney test; **independent t test; *** Chi-squared test; a Only those who have also heard about HPV were taken into account; b Only those who have heard about HPV and HPV vaccine were taken into account; c OHE - organized health education

4. DISCUSSION

Based on the presented data, we analyzed medical students' perception, knowledge, and awareness regarding the risk factors and prevention of cervical cancer. Our participants showed decent knowledge about cervical cancer with mean score being more than half of the total possible score. Similar data were obtained in a study conducted on a sample of 1,616 first-year female students at the University of Niš, which compared the knowledge of medical and non-medical students. First-year female medical students demonstrated better knowledge about HPV infection as a risk factor for cervical cancer compared to their non-medical peers. However, overall knowledge about HPV infection and the HPV vaccine was low among all student groups [24]. However, in a study done in Serbia's capital, Belgrade, a considerable portion of women had insufficient knowledge about cervical cancer, especially those who did not participate in mass screening [25]. This discrepancy can be explained by differences in study population, since our research included only college students, the future intellectual elite of the state. Furthermore, a good share of our participants had affiliation with medical profession which greatly contributed to higher cervical cancer knowledge level. In that manner, we proved that subjects involved in medical studies or those that attended medical high school had the highest knowledge about cervical cancer. In accordance with the previous interpretation, the results of another Serbian study showed that both students of secondary medical school and midwives who had finished that same school had significantly better knowledge than patients [26].

Apart from education, we also identified good financial status, living in urban areas and having parents with higher education as factor that contribute to better knowledge about cervical cancer. This means that higher socio-economic status is associated with better health standard and can explain the fact that the highest prevalence of cervical cancer is seen in underdeveloped countries [1]. However, data from relevant studies are inconsistent regarding this matter, occasionally showing low knowledge about cervical cancer even in people from developed countries. For example, in other Balkan countries the situation regarding cervical cancer and HPV knowledge is generally quite poor. In Romania, even though the majority of interviewed women have heard of HPV, the level of knowledge was low, especially about risk factors for infection [28]. Likewise, Greek adolescents were also insufficiently informed about risk factors and protection methods against cervical cancer [29]. Similar situation is also recorded in Hungary and Slovenia [30,31]. The inconsistency of the results from different studies was also noted regarding the association between relationship status and knowledge about cervical cancer. Whereas in our study students in relationship had higher CC-KS, there are other studies in which being single was associated with knowledge about cervical cancer screening [33].

Despite relatively good knowledge about cervical cancer in the investigated population HPV awareness was quite low. We established that a bit less than 50% of investigated students have heard of HPV infection. The research performed in Slovenia [31] that included women of wide range of ages and the one that included adolescents from Greece [29] also noted low awareness of HPV. On the other hand, the study in neighboring Romania [28] showed that between two thirds and three quarters of questioned women have heard about HPV. Such result was also recorded in our study among

subjects that finished medical high school and those attending medical faculty. In addition, in our study females in relationship and the ones that had sexual experience were more likely to have heard about HPV. This is encouraging since it implies that the subjects who enter into relationship at least have basic awareness about HPV. According to a study conducted at the University of Glasgow, Scotland, involving two groups of first-year medical students with a mean age range of 17-20 years, the results highlight a significant lack of understanding regarding the level of protection against cervical cancer provided by the HPV vaccine [32]. In a study conducted in Germany in 2010, a survey was administered to students aged 18 to 25 from six vocational schools in Berlin. A total of 259 women and 245 men completed a questionnaire that assessed socio-demographic data, sexual behaviors, HPV awareness, vaccination status, reasons for vaccine reluctance, and HPV-related knowledge. While 95% of women and 80% of men were aware of a 'vaccine for cervical cancer,' only half of the women and 25% of the men had heard of HPV. Overall knowledge was limited, with average scores of 2.8 (SD = 2.10) for women and 1.5 (SD = 1.49) for men (on a scale from 0 to 11). Additionally, 51% of women and 42% of men mistakenly believed that only women could contract HPV, and most were unaware that HPV is sexually transmitted [33]. Significant part of our study was also investigation of HPV vaccination awareness. This topic was especially important among medical students and young women [22-24,26].

5. CONCLUSION

The present study revealed sufficient knowledge about cervical cancer in examined population, but awareness about HPV infection was rather low. The pre-college education, significant difference in the score was established between participants from urban and rural areas with the former being better informed about cervical cancer, parents level of education also influenced cervical cancer knowledge. Since the highest score of knowledge about cervical cancer was determined in the group of students who denoted organized health education as a source, this established scenario should serve as a guide for development of the high-quality education programs directed particularly towards raising awareness about cervical cancer prevention and the importance of HPV vaccination. Furthermore, in accordance with the result that the media was the most common source of information, these campaigns should be conducted using exactly this information source. However, steps must be taken in order to increase its reliability, thus making the media a powerful instrument through which correct information would be spread to general public. In addition to such well-targeted health promotion campaigns, official national strategy is also necessary with the goal to introduce the HPV vaccine in NIP, with monitoring and real support from authorities. Only by achieving these goals can the cervical cancer burden be reduced.

REFERENCES

1. WHO. Cervical cancer. ESMO Handb Cancer Prev. Published online 2022;121-126. doi:10.7748/cnp.15.10.11.s10
2. World Cancer Research Fund International. Cervical cancer statistics | World Cancer Research Fund International. Cerv cancer Stat | World Cancer Res Fund Int. Published online 2022.
3. Ferlay J, Ervik M, Lam F, Laversanne M, Colombet M, Mery L, et al. Global Cancer Observatory: Cancer Today. 2024. Lyon, France: International Agency for Research on Cancer. Available from: <https://gco.iarc.who.int/today>, accessed [20 May 2025].
4. Bray F, Laversanne M, Weiderpass E, Soerjomataram I. The ever-increasing importance of cancer as a leading cause of premature death worldwide. *Cancer*. 2021; 127(16): 3029-3030. doi:10.1002/cnrc.33587
5. Jie Wu, Qianyun Jin, Yunmeng Zhang, Yuting Ji, Jingjing Li, Xiaomin Liu et al. Global burden of cervical cancer: current estimates, temporal trend and future projections based on the GLOBOCAN 2022. *Journal of the National Cancer Center*, [m5GeSdc; May 5, 2025;11:20], doi.org/10.1016/j.jncc.2024.11.006
6. Seppä K, Pitkaniemi J, Malila N, Hakama M. Age-related incidence of cervical cancer supports two aetiological components: A population-based register study. *BJOG* 2016, 123, 772-778.
7. Burd, E.M. Human papillomavirus and cervical cancer. *Clin. Microbiol. Rev.* 2003, 16, 1-17.
8. Walboomers JM, Jacobs MV, Manos MM, Bosch XF, Kummer AJ, Shah VK et al. Human papillomavirus is a necessary cause of invasive cervical cancer worldwide. *J. Pathol.* 1999, 189: 12-19.
9. Mangone L, Marinelli F, Bisceglia I, Braghiroli MB, Damato A, Pinto C. Five-year relative survival by stage of breast and colon cancers in northern Italy. *Front Oncol.* 2022 Oct 31;12:982461. doi: 10.3389/fonc.2022.982461.
10. zur Hausen H. Human papillomaviruses and their possible role in squamous cell carcinomas. *Curr. Top. Microbiol. Immunol.* 1977, 78, 1-30.
11. Kombe Kombe AJ, Li B, Zahid A, Mengist HM, Bounda GA, Zhou Y et al. Epidemiology and Burden of Human papillomavirus and Related diseases, Molecular Pathogenesis, and vaccine Evaluation. *Front. Public Health.* 2021, 8, 552028.
12. Muñoz N, Bosch X, de Sanjosé S, Herrero R, Castellsagué X, Shah VK et al. Epidemiologic classification of human papillomavirus types associated with cervical cancer. *N. Engl. J. Med.* 2003, 348, 518-527.
13. ICO/IARC. HPV INFORMATION CENTRE. 2023;2021(2):2005-2006.
14. Wei F, Georges D, Man I, Baussano I, Clifford GM (2024). Causal attribution of human papillomavirus genotypes to invasive cervical cancer worldwide: a systematic analysis of the global literature. *Lancet*. Published online 1 August 2024; doi.org/10.1016/S0140-6736(24)01097-3
15. Kovacevic G. Typing of Human Papilloma Virus (HPV) and Molecular Variants of Identified Types. Ph.D. Thesis, Faculty of Sciences, Department of Biology and Ecology, University of Novi Sad, Novi Sad, Serbia, 2016.
16. Kovacevic G, Milosevic V, Knezevic P, Knezevic A, Knezevic I, Radovanov J et al. Prevalence of oncogenic human papillomavirus and genetic diversity in the L1 gene of HPV16 HPV18 HPV31 and HPV33 found in women from Vojvodina Province Serbia. *Biologicals* 2019, 58, 57-63.
17. Institute of Public Health of Serbia "Dr Milan Jovanović Batut". Malignant Tumors in the Republic of Serbia, 2022. Serbian Cancer Registry. 2024, Belgrade
18. American Cancer Society. Risk Factors for Cervical Cancer. Available online: <https://www.cancer.org/cancer/cervical-cancer/causes-risks-prevention/risk-factors.html> (accessed on 15 December 2019).
19. Park I.S, Kim S.I, Han Y. Risk of female-specific cancers according to obesity and menopausal status in 2*7 million Korean women: similar trends between Korean and Western women. *Lancet Reg. Health West Pac* 2021; 11, 100146
20. Clarke, M.A. · Fetterman, B. · Cheung, L.C. Epidemiologic evidence that excess body weight increases risk of cervical cancer by decreased detection of precancer. *J. Clin. Oncol.* 2018; 36:1184-1191
21. Patel H, Jevc YB, Sherman M, Moss LE. Knowledge of human papillomavirus and the human papillomavirus vaccine in European adolescents: a systematic review. *Sex Transm Infect.* 2016; 92(6):474-9. doi.org/10.1136/sextrans-2015-052341.
22. Chernyshov PV, Humenna I. Human papillomavirus: vaccination, related cancer awareness, and risk of transmission among female medical students. *Acta Dermatovenerol Alp Pannonica Adriat.* 2019; 28(2):75-79.
23. R-Core Team R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna <http://www.R-project.org/>. (2013, Accessed on February 15 2020)
24. Natasa K. Rancic, Milan B. Golubovic, Mirko V. Ilic, Aleksandra S. Ignjatovic, Radomir M. Zivadinovic, Sasa N. Denic et al. Knowledge about Cervical Cancer and Awareness of Human Papillomavirus (HPV) and HPV Vaccine among Female Students from Serbia. *Medicina* 2020, 56, 406; doi:10.3390/medicina56080406
25. Jovanovic V, Mitrovic Jovanovic A, Kocic S, Vasiljevic M, Krasic V. Knowledge about cervical cancer, Pap test, and barriers to women's participation in screening in Belgrade, Serbia. *Eur J Gynaecol Oncol.* 2017; 38(1):69-75.
26. Monteiro DLM, Brollo LCS, Souza TP, dos Santos PRJ, Santos RG, Correa T, Costa TJ. et al. Knowledge on the HPV vaccine among university students. *Rev Inst Med Trop Sao Paulo.* 2018;60:e46. doi.org/10.1590/s1678-9946201860046.
27. Rancic NK, Miljkovic PM, Deljanin ZM, Marinkov-Zivkovic EM, Stamenkovic BN, Bojanovic MR et al. Knowledge about HPV Infection and the HPV Vaccine among Parents in Southeastern Serbia. *Medicina* 2022, 58, 1697. doi.org/10.3390/medicina58121697
28. Grigore M, Telesanu SI, Pristavu A, Matei M. Awareness and Knowledge About HPV and HPV Vaccine Among Romanian Women. *J Cancer Educ.* 2018; 33(1):154-159.
29. Vaidakis D, Moustaki I, Zervas I, Barbouni A, Merakou K, Chrysi SM et al. Knowledge of Greek adolescents on human papilloma virus (HPV) and vaccination: A national epidemiologic study. *Medicine (Baltimore)* 2017; 96(1): e5287. doi.org/10.1097/MD.0000000000005287
30. Balla B.C. Terebessy A; Tóth E; Balázs, P; Young Hungarian Students' Knowledge about HPV and Their Attitude Toward HPV Vaccination. *Vaccines (Basel).* 2016; 5(1):1. doi.org/10.3390/vaccines5010001.
31. Vrscaj MU, Vakselj A, Strzinar V, Bebar S, Baskovic M et al. Knowledge about and attitudes to Pap smears, cervical cancer and human papillomavirus among women in Slovenia. *Eur J Gynaecol Oncol.* 2008; 29(2):148-153.
32. Sherman M, Nailer E, Minshall C, Coombes R, Cooper J, Redman EWC. Awareness and knowledge of HPV and cervical cancer in female students: A survey (with a cautionary note). *J Obstet Gynaecol.* 2016; 36(1):76-80.
33. Blödt S, Holmberg C, Müller-Nordhorn J, Rieckmann N. Human Papillomavirus awareness, knowledge and vaccine acceptance: a survey among 18-25 year old male and female vocational school students in Berlin, Germany. *Eur J Public Health.* 2012 Dec;22(6):808-13. doi: 10.1093/eurpub/ckr188. Epub 2011 Dec 23.

UTICAJ ISHRANE NA PREVALENCIJU HRONIČNIH NEZARAZNIH BOLESTI U CRNOJ GORI

DIETARY INFLUENCE ON THE PREVALENCE OF NONCOMMUNICABLE DISEASES IN MONTENEGRO

Snežana Labović Barjaktarović ^{1,2}, Mirjana Nedović Vuković ^{1,2}, Ivana Joksimović ^{1,2}, Marina Jakšić ^{2,3}

1 Institut za javno zdravlje Crne Gore, Podgorica, Crna Gora

2 Medicinski fakultet, Univerzitet Crne Gore, Podgorica, Crna Gora

3 Klinički centar Crne Gore, Podgorica, Crna Gora

SAŽETAK

Uvod: Hronične nezarazne bolesti (HNZB) predstavljaju vodeći uzrok obolijevanja i smrtnosti u Crnoj Gori i u svijetu. Ishrana je jedan od ključnih faktora rizika u njihovom nastanku i progresiji.

Cilj: Cilj ovog rada je da analizira navike u ishrani stanovništva Crne Gore i prevalenciju HNZB, identifikuje ključne prehrambene faktore rizika i ponudi preporuke za unapređenje javnog zdravlja kroz promjene u ishrani.

Metodologija: U radu su korišćeni dostupni podaci iz nacionalnih zdravstvenih anketa, statističkih izvještaja i međunarodnih baza podataka. Analizirani su prevalenca gojaznosti, dijabetesa, kardiovaskularnih i malignih bolesti, kao i trendovi u ishrani i nutritivni status populacije.

Rezultati: Analiza ukazuje na porast učestalosti HNZB i visok nivo izloženosti faktorima rizika, uključujući neadekvatan unos voća i povrća, visok unos soli, šećera i zasićenih masti, te nisku fizičku aktivnost. Poseban izazov predstavljaju prehrambene navike djece i adolescenata.

Zaključak: Potrebna je multisektorska strategija sa akcentom na prevenciju, reformu prehrambenog okruženja, promociju zdravih izbora i kontinuirano praćenje prehrambenih navika kroz sistematska istraživanja.

Ključne riječi: hronične nezarazne bolesti, ishrana, faktori rizika, javno zdravlje, Crna Gora

ABSTRACT

Introduction: Noncommunicable diseases (NCDs) are the leading cause of morbidity and mortality in Montenegro and globally. Diet is one of the key risk factors contributing to their development and progression.

Objective: This paper aims to analyze the dietary habits of the Montenegrin population and the prevalence of NCDs, identify key nutritional risk factors, and offer recommendations to improve public health through dietary interventions.

Methods: The paper is based on data from national health surveys, statistical reports, and international databases. It analyzes the prevalence of obesity, diabetes, cardiovascular and malignant diseases, as well as dietary trends and the nutritional status of the population.

Results: The analysis shows an increasing trend in the prevalence of NCDs and a high exposure to risk factors, including low intake of fruits and vegetables, high intake of salt,

sugar, and saturated fats, and low physical activity. Dietary habits among children and adolescents pose a particular challenge.

Conclusion: A multisectoral strategy focused on prevention, food environment reform, promotion of healthy choices, and continuous monitoring of dietary patterns through systematic surveys is needed.

Keywords: noncommunicable diseases, nutrition, risk factors, public health, Montenegro

UVOD

Hronične nezarazne bolesti (HNZB) predstavljaju vodeći uzrok obolijevanja i smrtnosti u savremenim društvima [1], a Crna Gora nije izuzetak [2-4]. Prema procjenama Globalnog opterećenja bolešću iz 2019. godine, čak 94% svih smrtnih slučajeva i 86% ukupnog opterećenja bolešću u Crnoj Gori uzrokovano je upravo HNZB [5].

Najznačajnije grupe HNZB uključuju kardiovaskularna oboljenja, maligne bolesti, hronične respiratorne bolesti i šećernu bolest. Ove četiri grupe zajedno čine oko 80% svih prijevremenih smrti uzrokovanih HNZB na globalnom nivou. Kardiovaskularne bolesti su najčešći uzrok smrti (43,4%), a slijede ih karcinomi (22,9%), hronične respiratorne bolesti (9,1%) i dijabetes (4,6%) [1].

Faktori rizika za nastanak i progresiju HNZB su brojni, ali dominantni su tzv. faktori u vezi sa ponašanjem i metabolički faktori rizika. Među faktorima rizika povezanim sa ponašanjem posebno se izdvajaju upotreba duvana, nepravilna ishrana (bogata zasićenim mastima, trans-mastima, šećerom i solju), fizička neaktivnost i štetna upotreba alkohola [1,4,5]. Metabolički faktori rizika uključuju povišen krvni pritisak, povećane vrijednosti glikemije i lipida u krvi, kao i prekomjernu tjelesnu masu i gojaznost, a među njima je najvažniji povišen krvni pritisak, odgovoran za čak 25% smrtnih slučajeva povezanih sa HNZB [1,5].

Efikasno upravljanje HNZB zahtijeva sistemski pristup koji uključuje prevenciju, pravovremenu dijagnostiku i kontrolu faktora rizika [1,5].

Značaj pravilne ishrane u prevenciji u kontroli HNZB je neupitan. Ona je ključni promjenljivi faktor rizika, uz fizičku neaktivnost, pušenje i konzumaciju alkohola [7,8]. Nepravilna ishrana, podrazumijeva visok unos zasićenih i trans-masti, rafiniranih šećera i soli, te nedostatak voća, povrća, integralnih žitarica i vlakana, direktno je povezana sa povećanjem tjelesne mase, povišenim krvnim pritiskom, hiperglikemijom i dislipidemijom - što sve povećava rizik od razvoja hroničnih bolesti [7,8].

Suprotno tome, pravilna ishrana - bogata povrćem, voćem, integralnim žitaricama, nezasićenim mastima i ograničenim unosom soli i šećera - djeluje kao zaštitni faktor. Takav režim ishrane pomaže u održavanju zdravlja i značajno doprinosi smanjenju rizika od hroničnih bolesti, posebno kardiovaskularnih [8-11]. Ovaj rad daje prikaz dostupnih podataka o ishrani, nutritivnom statusu stanovništva Crne Gore i prevalenciji hroničnih nezaraznih bolesti, identifikuje ključne nutritivne faktore rizika i predlaže mjere za unapređenje javnog zdravlja kroz promjene u načinu ishrane. Poseban akcenat stavljen je na identifikaciju javnozdravstvenih izazova i mogućnosti za preventivne intervencije.

Glavni deo rada

U Crnoj Gori, kao i u većem dijelu svijeta, epidemiološka tranzicija dovela je do toga da nezarazne bolesti (HNZB) - naročito kardiovaskularna oboljenja, dijabetes i maligne bolesti - postanu vodeći uzroci obolijevanja, invaliditeta i prijevremenog umiranja stanovništva. Prema dostupnim podacima, oko 75% svih smrtnih slučajeva uzrokovano je HNZB. Od ukupnog broja umrlih za skoro polovinu uzrok su bile bolesti srca i krvnih sudova i za skoro četvrtinu maligne neoplazme [12], dok su bolesti sistema krvotoka i maligne neoplazme najčešći pojedinačni uzroci smrtnosti i hospitalizacija [12,13].

Situacija u Crnoj Gori, po pitanju opterećenja nezaraznim bolestima, je slična onoj koja se vidi i u ostatku Evrope i većini zemalja svijeta [14].

Podaci o obolijevanju od nezaraznih bolesti, prema procjenama iz informacionog sistema primarne zdravstvene zaštite, tokom perioda 2012-2022. godine pokazuju da bolesti sistema krvotoka bile su zastupljene kod oko 30% odraslog stanovništva u Crnoj Gori i da u posmatranom periodu bilježe blagi trend rasta (oko 8% u toku ovog perioda) [13].

Ove bolesti, iako nezarazne, imaju predvidive faktore rizika i često su rezultat stila života, što dodatno naglašava značaj javnozdravstvenih intervencija.

U Crnoj Gori su do sada sprovedena dva istraživanja o zdravlju stanovništva i zdravstvenoj zaštiti (2008., 2012.) na reprezentativnom uzorku crnogorske populacije i dobijeni su korisni relevantni podaci koji se odnose na faktore rizika: pušenje, konzumiranje alkohola, fizičku aktivnost, ishranu. U 2008. godini 32,7% odrasle populacije (20+ godina) je imalo hipertenziju ili potencijalnu hipertenziju, a prema indeksu tjelesne mase 55,1% odraslih je imalo prekomjernu tjelesnu masu. Samo 11,5% odraslih upražnjavalo je fizičku aktivnost više od tri puta nedjeljno. Alkohol je konzumiralo 25,1% odraslog stanovništva svakodnevno ili povremeno u 2008. godini, odnosno značajno više (32%) u 2012. godini [15-18].

Najnoviji epidemiološki podaci i nalazi nacionalnih istraživanja u Crnoj Gori ukazuju na značajnu prevalenciju faktora u vezi sa ponašanjem i metaboličkih faktora rizika. Među faktorima u vezi sa ponašanjem posebno se izdvajaju pušenje, nepravilna ishrana, fizička neaktivnost i konzumacija alkohola. Prema najnovijem Istraživanju o kvalitetu života, životnim stilovima i zdravstvenim rizicima stanovnika Crne Gore u 2017. godini [19], više od trećine odraslih (35,4%) u Crnoj Gori aktivno puši, 17,1% je pušilo u nekom trenutku života, dok je skoro polovina stanovništva Crne Gore (47,6%) apstiniralo tokom čitavog života. Među odraslima 63,5% je prijavilo upotrebu alkohola u životu, polovina upotrebu alkohola u prethodnih godinu dana, a 42,1% upotrebu alkohola u prethodnih mjesec dana, dok fizičku aktivnost tri ili više puta sedmično praktikuje svega 11,5% odraslih. Ovo, u kombinaciji s lošim navikama u ishrani, kao što su visok unos soli, trans-masti i šećera, stvara uslove za razvoj metaboličkih poremećaja i gojaznosti.

Posebno zabrinjavaju podaci su koji se odnose na žene, što potvrđuje i istraživanje sprovedeno na nacionalnom uzorku žena starosti 15-49 godina [20]. Prema tim rezultatima, visceralna (abdominalna) gojaznost, koja je najopasniji oblik gojaznosti zbog povezanosti sa hroničnom upalom i metaboličkim poremećajima [21], prisutna je kod skoro 50% žena.

Njena prevalencija raste sa godinama, što pokazuje efekat kumulacije nezdravih životnih navika tokom vremena. Alarmanтно je da više od 60% žena u dobi od 40-49 godina ima ovaj oblik gojaznosti.

Prevalencija metaboličkog sindroma od preko 10% među ženama u Crnoj Gori [20] koje nijesu trudne jeste vjerovatno najvažniji nalaz, jer on podrazumijeva prisustvo najmanje tri od pet ključnih rizičnih stanja: visceralna gojaznost, povišeni trigliceridi, nizak HDL, hipertenzija i povišeni šećer. Najzastupljenija kombinacija kod žena u Crnoj Gori uključuje visceralnu gojaznost, nizak HDL i povišene trigliceride. To je veoma nepovoljna kombinacija jer ukazuje na hronično upalno stanje i značajno povećan rizik za razvoj kardiovaskularnih bolesti i dijabetesa.

Indikatori kardiometaboličkog zdravlja pokazuju da problemi kardiovaskularnog zdravlja i gojaznost pogađaju značajan procenat žena [20]. Činjenica da je 66% žena koje nijesu trudne u nekom trenutku izmjerilo kolesterol i/ili trigliceride govori o određenom stepenu svijesti i pristupu zdravstvenoj zaštiti. Ipak, čak 17% tih žena navelo je da su im vrijednosti bile povišene - što već ukazuje na značajan rizik za razvoj kardiovaskularnih bolesti. Kada se govori o masnoćama u krvi, skoro 14% žena ima povišene trigliceride, dok nizak HDL kolesterol ima oko 30% žena. Važno je istaći da ove vrijednosti nisu ravnomjerno raspoređene: najviše ih je kod starijih žena (40-49 godina), u sjevernom regionu i među siromašnijima. Povećan odnos trigliceridi/HDL, koji je posebno relevantan za predviđanje kardiovaskularnih bolesti, prisutan je kod čak 40% žena, a kod onih starosti 40-49 godina - više od polovine. Ova grupa žena time ulazi u najrizičniju kategoriju. Prisustvo povišenog odnosa trigliceridi/HDL predstavlja dobar prediktor kardiometaboličkog rizika [21].

Analiza stanja ishrane dodatno komplikuje zdravstvenu sliku. Više od 75% žena ima minimalno raznovrsnu ishranu, a unosi voća i povrća su zabrinjavajuće niski. Nedostaci mikronutrijenata, kao što su gvožđe, folat i vitamin D, široko su rasprostranjeni. Posebno je istaknuto da skoro 60% žena ima deficit gvožđa, a 25% je anemično, što može imati ozbiljne posljedice po reproduktivno i opšte zdravlje žena. Folatni deficit posebno pogađa adolescentkinje, a kombinovani deficit i insuficijencija vitamina D pogađa preko 40% žena.

Pitanje vitamina D, iako često zanemareno, otvara važnu diskusiju o suplementaciji i preventivnoj medicini. Naime, deficit vitamina D je uočljivo povezan sa dislipidemijom, gojaznošću i povećanim kardiometaboličkim rizikom. Iako pravac uzročno-posljedične veze nije u potpunosti jasan, jasno je da suplementacija kod rizičnih grupa, poput žena s niskim HDL i visokim trigliceridima, može biti efikasna javnozdravstvena mjera.

Iako je glikemiju kontrolisalo približno dvije trećine žena, svega 6% njih navodi da imaju povišen nivo glukoze. Ovo može izgledati ohrabrujuće, ali zabrinjava to što vrlo mali broj žena koristi terapiju za regulaciju glukoze. To može ukazivati na nedostatak dijagnostikovanja ili nedovoljnu ozbiljnost u pristupu terapiji, čime se propušta prilika za ranu intervenciju u slučaju predijabetesa ili dijabetesa. Dijabetes melitus i predijabetes su prisutni kod relativno malog broja žena (manje od 1% ima dijabetes, a 3,5% predijabetes), ali važna činjenica je da je više od 5% žena starosti 40-49 godina imalo povišeni HbA1c - marker koji ukazuje na hroničnu hiperglikemiju. Taj procenat dodatno raste kod žena s nižim obrazovanjem, u sjevernom regionu i među najsitimašnijim domaćinstvima. To jasno pokazuje snažan uticaj socijalnih determinanti zdravlja - obrazovanje, prihod i geografski položaj [20].

Dijabetes postaje sve veći javnozdravstveni problem u Crnoj Gori. Incidencija dijabetesa tip 1 kod djece raste [23], a 12,9% odraslih ima dijabetes prema izvještaju iz Registra iz 2015. godine. Međunarodna federacija za dijabetes procijenila je da je 43,4% osoba s dijabetesom u Crnoj Gori nedijagnostikovano, što je oko 5,6% odraslih [24].

Pored toga, prema istraživanju o ishrani hipertenzija je prisutna kod 15% žena [20], s najočiglednijim porastom u starijim dobnim grupama. Skoro četvrtina žena starosti 40-49 godina ima hipertenziju, ali mali broj njih koristi terapiju trenutno. To ponovo ukazuje na nedovoljno liječenje, možda zbog lošeg pristupa zdravstvenim uslugama, zanemarivanja simptoma, ili loše informisanosti.

Da je hipertenzija zabrinjavajući javnozdravstveni problem ukazuju i podaci o umiranju u Crnoj Gori prema kojima se hipertenzija našla među pet vodećih pojedinačnih uzroka smrti kod oba pola [12].

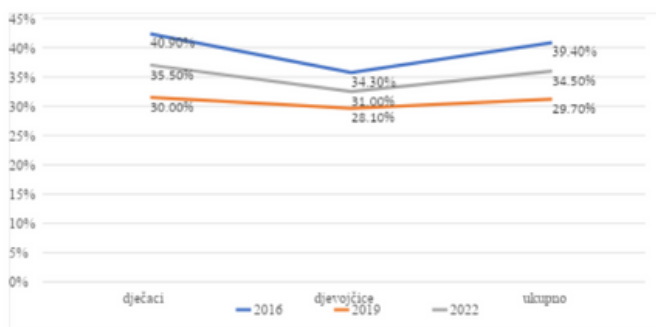
Visok unos soli i nizak unos kalijuma doprinose hipertenziji i povećanom riziku od srčanih i moždanih udara [25].

Program za smanjenje unosa soli u periodu 2017-2025. godine predlaže mjere za smanjenje konzumacije soli kroz edukaciju, reformulaciju proizvoda i praćenje unosa soli i kalijuma u populaciji. Prva studija iz 2017. pokazala je da je prosječan dnevni unos soli kod odraslih u Crnoj Gori iznosi 11,6 grama, dok samo 7% ispitanika zadovoljava preporuke SZO o unosu soli od 5 grama ili manje. Muškarci konzumiraju više soli i kalijuma u odnosu na žene u Crnoj Gori, a podaci o unosu soli kod djece još nisu dostupni [26,27]. Smanjenje unosa soli na ispod 5 grama dnevno moglo bi spriječiti do 1,7 miliona smrtnih slučajeva godišnje u svijetu [28].

U Crnoj Gori raste zabrinutost zbog porasta gojaznosti kod i kod djece i kod odraslih. Prema istraživanju stilova života iz 2017. godine 40% odraslih ima prekomjernu tjelesnu masu, od čega je 15% gojazno, dok je fizička aktivnost niska. Samo 13% vježba više od tri puta nedjeljno, a 8,6% vježba svakodnevno. 63,5% koristi alkohol u životu, a prosječna godišnja potrošnja alkohola po osobi iznosi 10,3 litra. Ove navike značajno doprinose zdravstvenim problemima [3]. Globalno, prevalencija gojaznosti kod odraslih kontinuirano raste, što potvrđuje i regionalna situacija u Crnoj Gori. U posljednjih tridesetak godina zabilježen je značajan porast u gotovo svim zemljama svijeta, uključujući Crnu Goru. Između 1990. i 2022. godine, u 94% zemalja svijeta zabilježen je rast prevalencije gojaznosti kod žena, a u većini i kod muškaraca [29].

Kod djece, situacija nije ni malo bolja. Prema rezultatima COSI istraživanja iz 2022. Godine (grafik br.1) Crna Gora se nalazi na četvrtom mjestu u Evropi po prevalenciji gojaznosti kod djece, odmah iza Španije, Grčke i Italije. Gojaznost u djetinjstvu predstavlja ozbiljan prediktor budućih hroničnih bolesti, a zabrinjavajuće je da roditelji često imaju iskrivljenu percepciju o uhranjenosti svoje djece - samo 1% roditelja u Crnoj Gori prepoznaje da mu je dijete gojazno, iako je 30% djece gojazno ili ima prekomjernu tjelesnu masu. Ovo ukazuje na važnost edukacije roditelja i nastavnog osoblja o pravilnoj ishrani i tjelesnoj aktivnosti. Primjetno je da se broj gojaznih dječaka (19,3%) u odnosu na prethodnu rundu (16,1%) povećao, a da je pogrešna percepcija roditelja o uhranjenosti djece ostala i dalje na približno istom nivou [30],

Grafik br.1: Prevalenca predgojaznosti i gojaznosti u 3 runde COSI (WHO, IJZCG)



Gojaznost je dokaz nepravilne ishrane. Gojaznost kod djece odnosno prekomjerna telesna masa, dobra su osnova za hronične nezarazne bolesti u odrasлом periodu. Najčešći uzroci gojaznosti kod djece neadekvatna ishrana, u smislu nepravilnog ritma obroka, i nedovoljna fizička aktivnost [30]. Istraživanja za Crnu Goru pokazuju i da je jedna trećina adolescenata gojazna [31,32]. Da je gojaznost kao odraz nepravilne ishrane ozbiljan problem u Crnoj Gori pokazuju i procijenjeni godišnji broj smrtnih slučajeva koji se pripisuju gojaznosti iznosi 90 na 100000 ljudi [33].

Za rješavanje pitanja gojaznosti Ministarstvo zdravlja Crne Gore je izradilo program mjera za poboljšanje stanja uhranjenosti i ishrane stanovništva. Program je koncipiran kao nastavak Programa za prevenciju i kontrolu hroničnih nezaraznih bolesti i uključuje akcioni plan za period od 2021. do 2022. godine [18].

Optimalna ishrana treba da obezbijedi dovoljan unos proteina, masti, ugljenih hidrata, vitamina i minerala. Međutim, često se konzumiraju velike količine prerađene hrane bogate zasićenim mastima, trans mastima, šećerima i soli, kao što su brza hrana, grickalice, gazirani napici i procesuirano meso [34]. Povrće i voće u Crnoj Gori ne konzumira se dovoljno posebno kada je u pitanju konzumiranje više puta na dan, Većinu dana u toku nedelje skoro svako 10 djece konzumira „brzu hranu“ [30].

Hronične nezarazne bolesti (HNZB) predstavljaju glavni izazov za zdravstvene sisteme savremenih društava, a Crna Gora nije izuzetak. Zdravstveni sistem u Crnoj Gori suočava se sa sve većim izazovima vezanim za kontrolu i tretman HNZB. Podaci iz bolničkih registara i sistema primarne zdravstvene zaštite potvrđuju da su bolesti sistema krvotoka vodeći uzrok hospitalizacija i smrti. U periodu 2012-2022. godine, kardiovaskularne bolesti su bile prisutne kod oko 30% odraslih, uz blagi trend rasta. Takođe, zabrinjava podatak da je više od 40% osoba s dijabetesom u Crnoj Gori nedijagnostikovano, što govori o propustima u ranoj detekciji i nedovoljnom praćenju visokorizičnih grupa.

Pohvalno je što Ministarstvo zdravlja prepoznaje ozbiljnost problema i reagovalo je usvajanjem različitih strateških dokumenata. U cilju smanjenja obolijevanja i umiranja u Crnoj Gori od nezaraznih bolesti, usvojena su strateška, programska i planska dokumenta koja se odnose na prevenciju i kontrolu nezaraznih bolesti. Ministarstvo zdravlja je 2008.

godine izradilo Strategiju za prevenciju i kontrolu hroničnih nezaraznih bolesti [2], koja daje osnovne smjernice za sveobuhvatni i koordinisani odgovor na opterećenje nezarazanim bolestima, ali koja je zbog nedovoljnih finansijskih sredstava bila ograničena sa rezultatima. Neophodno da se pristupi izradi novog programa za kraći period koji bi rezultirao pozitivnim ishodima u ovoj oblasti [17].

Program za prevenciju i kontrolu HNZB, kao i Akcioni plan za ishranu i borbu protiv gojaznosti (2021-2022), ukazuju na institucionalnu spremnost za djelovanje. Međutim, izazovi ostaju, naročito u pogledu implementacije mjera, multisektorske koordinacije i osiguravanja održivog finansiranja.

Primjeri uspješnih intervencija uključuju Program za smanjenje unosa soli [26], koji ima za cilj redukciju prosječnog dnevnog unosa soli na ispod 5 grama. Početna studija iz 2017. godine pokazala je da odrasli u Crnoj Gori unose prosječno 11,6 grama soli dnevno, što je više nego dvostruko od preporuka SZO [28]. S obzirom na jaku povezanost između unosa soli, hipertenzije i kardiovaskularnih oboljenja, jasno je da bi uspjeh ovog programa mogao imati značajne efekte na smanjenje mortaliteta i morbiditeta [26].

Ne može se ignorisati ni uticaj socijalnih determinanti zdravlja. Istraživanja dosljedno pokazuju da žene s nižim obrazovanjem, iz siromašnijih domaćinstava i sjevernog regiona imaju značajno veći rizik od metaboličkih poremećaja. Ovo jasno govori da zdravstvene politike moraju biti društveno osjetljive i da prevencija ne može biti ograničena na savjete o ishrani i vježbanju, već mora uključiti i šire mjere socijalne zaštite, obrazovanja i regionalnog razvoja.

Na kraju, jedno od najvažnijih pitanja jeste potreba za redovnim, sveobuhvatnim i nacionalno reprezentativnim istraživanjima o zdravlju i ishrani. Posljednja velika istraživanja datiraju iz 2008. i 2012. godine, što onemogućava tačno i ažurno praćenje trendova i evaluaciju postojećih intervencija. U nedostatku pouzdanih podataka, planiranje zdravstvenih politika ostaje ograničeno.

ZAKLJUČAK

Crna Gora je još 2008. godine usvojila Strategiju za prevenciju i kontrolu NCD, ali nedovoljna implementacija usljed finansijskih i organizacionih ograničenja ostavila je prostor za dalje pogoršanje pokazatelja. Program za kontrolu i prevenciju NCD 2019-2021 identifikuje gojaznost i loše navike u ishrani kao ključne faktore rizika, ali sistemski odgovor još nije dao značajnije rezultate.

Prevencija nije sistemski integrisana u primarnu zdravstvenu zaštitu, a ovi rezultati ukazuju da je promocija zdravih stilova života i dalje nedovoljno prisutna na terenu.

Rješavanje problema nezaraznih bolesti u Crnoj Gori zahtijeva fokus ne samo na liječenje, već i na strukturne promjene koje podržavaju zdrav način života i omogućavaju ranu intervenciju. Kombinacija visoke prevalencije metaboličkih poremećaja među ženama, rastuće stope gojaznosti i ograničenog odgovora zdravstvenog sistema na faktore rizika, ukazuje na potrebu hitnog i integrisanog pristupa sa ozbiljnijim pristupom sljedećim segmentima: Uvođenje Sistematskih programa skrininga i ranog otkrivanja gojaznosti i metaboličkog sindroma; Multisektorske intervencije usmjerene na poboljšanje ishrane (povećanje dostupnosti zdrave hrane); Edukacija o ishrani i životnim navikama, kroz škole, medije i primarnu zdravstvenu zaštitu; Promocija i povećanje fizičke aktivnosti kroz infrastrukturu i programe zajednice -edukacije i uključivanje zajednica u planiranje promjena ponašanja; Jačanje kapaciteta za praćenje i evaluaciju HNZB pokazatelja u stvarnom vremenu.

Potrebno je sprovesti novija istraživanja o opterećenju bolestima u Crnoj Gori. Kardiometaboličko zdravlje žena u Crnoj Gori ozbiljno je ugroženo kombinacijom fizioloških, socijalnih i faktora u vezi sa ponašanjem. Problem nije samo u pojedinačnim indikatorima poput visoke glikemije ili triglicerida, već u njihovom udruživanju, što vodi ka sistemskim poremećajima koji značajno povećavaju rizik od hroničnih bolesti. Ključni koraci

uključuju rano prepoznavanje gojaznosti, bolju dostupnost dijagnostike, jačanje primarne zdravstvene zaštite i multisektorske intervencije u zajednici.

Promena načina ishrane je jedan od najefikasnijih i najjeftinijih načina za smanjenje opterećenja hroničnim bolestima. Vlade, zdravstveni sistemi i obrazovne institucije treba da promovišu zdravu ishranu kao deo šire strategije javnog zdravlja. Edukacija stanovništva, pravilno označavanje hrane, dostupnost zdravih namirnica i regulacija prehrambene industrije su ključni koraci ka unapređenju ishrane i prevenciji bolesti.

Uzimajući u obzir sve navedeno, ishrana se nameće kao jedan od najvažnijih promenljivih faktora rizika za prevenciju i kontrolu HNZB. Ulaganja u edukaciju stanovništva, unapređenje prehrambenih politika i promociju zdravih stilova života su neophodni kako bi se usporio ili zaustavio trend porasta HNZB u Crnoj Gori.

Nepravilna ishrana predstavlja jedan od ključnih faktora koji doprinose visokoj prevalenciji hroničnih nezaraznih bolesti u Crnoj Gori. Podaci ukazuju na alarmantne stope gojaznosti i nezadovoljavajući nutritivni status, naročito među djecom i ženama u reproduktivnom dobu.

Bez snažne i koordinisane intervencije, zdravstveni sistem će biti dodatno opterećen rastućim brojem hroničnih pacijenata.

REFERENCE

1. World Health Organization. Noncommunicable diseases. Geneva: WHO; [cited 2025 Jun 5]. Available from: <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>
2. Vlada Crne Gore, Ministarstvo zdravlja, rada i socijalnog staranja. Strategija za prevenciju i kontrolu hroničnih nezaraznih bolesti. 2008. Dostupno na: <https://www.gov.me/dokumenta/8f83c1e0-1171-444f-8a77-9dd3d6c5632b> (pristupljeno 05.06.2025).
3. Ministarstvo zdravlja. Program za kontrolu i prevenciju nezaraznih bolesti u Crnoj Gori 2019-2021. Sa Akcionim planom za period 2019-2020. godine. Vlada Crne Gore; 2019. Dostupno na: <https://www.gov.me/dokumenta/a787a40b-b534-47d8-a7c5-c6e355d77f3c>
4. World Health Organization. Noncommunicable diseases country profiles 2025. Geneva: WHO; 2025. Dostupno na: <https://www.who.int/newsroom/noncommunicable-diseases/surveillance/data/profiles-ncd>
5. Institute for Health Metrics and Evaluation (IHME). Global Burden of Disease Study 2019 results. Seattle, WA: IHME; 2020. Dostupno na: <https://ghdx.healthdata.org/gbd-2019>
6. Centers for Disease Control and Prevention (CDC). Poor Nutrition. Atlanta: CDC; [cited 2025 Jun 5]. Available from: <https://www.cdc.gov/chronicdisease/resources/publications/factsheets/nutrition.htm>
7. World Health Organization. SDG Target 3.4: Reduce by one third premature mortality from NCDs. Geneva: WHO; [cited 2025 Jun 5].
8. FAO, WHO. Diet, nutrition and the prevention of chronic diseases. Report of a joint FAO/WHO expert consultation. WHO Technical Report Series No. 916. Geneva: WHO; 2003.
9. World Health Organization. Healthy diet. Geneva: WHO; [cited 2025 Jun 5]. Available from: <https://www.who.int/news-room/fact-sheets/detail/healthy-diet>
10. World Heart Federation. Diet and cardiovascular disease. Geneva: WHF; [cited 2025 Jun 5]. Available from: <https://world-heart-federation.org>
11. Centers for Disease Control and Prevention (CDC). Nutrition. Atlanta: CDC; [cited 2025 Jun 5]. Available from: <https://www.cdc.gov/chronicdisease/resources/publications/factsheets/nutrition.htm>
12. Institut za javno zdravlje Crne Gore. Podaci o mortalitetu. Dostupno na: <https://www.ijzcg.me/me/izvjestaji/umrlji-prema-uzroku-smrti-pogrupama-obiljenja-polu-i-starosti-u-crnoj-gori-2010-2019>
13. Institut za javno zdravlje Crne Gore. Statistički godišnjaci o zdravlju stanovništva i zdravstvenoj zaštiti u Crnoj Gori 2012-2022. Dostupno na: <https://www.ijzcg.me/me/publikacije/statisticki-godisnjaci-o-zdravlju-stanovnistva-i-zdravstvenoj-zastiti-u-crnoj-gori>
14. Nacionalna zdravstvena anketa stanovništva Crne Gore 2008. Podgorica: Ipsos Strategic Marketing; 2008.
15. Nacionalna zdravstvena anketa stanovništva Crne Gore 2012. Podgorica: Ipsos Strategic Marketing; 2012.
16. Ministry of Health of Montenegro. Program za kontrolu i prevenciju nezaraznih bolesti u Crnoj Gori 2019-2021. Sa Akcionim planom za period 2019-2020. godine. Vlada Crne Gore; 2019. Dostupno na: <https://www.gov.me/dokumenta/a787a40b-b534-47d8-a7c5-c6e355d77f3c>
17. Ministry of Health of Montenegro. Program mjera za unaprijeđenje stanja uhranjenosti i ishrane u Crnoj Gori s Akcionim planom 2021-2022. Podgorica; 2021. Dostupno na: <https://wapi.gov.me/download-preview/58ce227f-3536-4d33-af5c-32e435ab7465?version=1.0>
18. Đurišić T, Golubović Lj, Mugoša B. Istraživanje o kvalitetu života, životnim stilovima i zdravstvenim rizicima stanovnika Crne Gore: Nacionalni izvještaj. Institut za javno zdravlje Crne Gore i MONSTAT; 2017. Dostupno na: <https://s3.eu-central-1.amazonaws.com/web.repository/ijzcg-media/files/1568801609-istrazivanje-o-kvalitetu-zivota-zivotnim-stilovima-i-zdravstvenim-rizicima-stanovnika-crne-gore-u-2017.pdf>
19. Institut za javno zdravlje Crne Gore, UNICEF, GroundWork. Istraživanje o ishrani u Crnoj Gori 2022. Podgorica; 2022. Dostupno na: https://www.sdgmontenegro.me/assets/documents/cnr/2404/6_Finalni_izvjestaj_istrazivanje_o_ishrani_Crna_Gora.pdf
20. Powell-Wiley TM, Poirier P, Burke LE, Després JP, Gordon-Larsen P, Lavie CJ, et al. Obesity and cardiovascular disease: a scientific statement from the American Heart Association. *Circulation*. 2021;143(21):e984-e1010.
21. Mederos-Torres CV, Diaz-Burke Y, Muñoz-Almaguer ML, García-Zapién AG, Uvalle-Navarro RL, González-Sandoval CE. Triglyceride/high-density cholesterol ratio as a predictor of cardiometabolic risk in young population. *J Med Life*. 2024;17(7):722-727.
22. Samardžić M, Popović N, Terzić N, Popović-Samardžić M, Nedović-Vuković M. Rising incidence of childhood type 1 diabetes in Montenegro. *Srp Arh Celok Lek*. 2016;144(7-8):408-412.
23. Likić D. Report on the incidence of diabetes in 2015. Institute for Public Health of Montenegro; 2022. Dostupno na: <https://www.ijzcg.me/me/izvjestaji/godisnji-izvjestaji-o-obiljevalju-od-secerne-bolesti-u-crnoj-gori>
24. Strazzullo P, D'Elia L, Kandala NB, Cappuccio FP. Salt intake, stroke, and cardiovascular disease: meta-analysis of prospective studies. *BMJ*. 2009;339:b4567.
25. Vlada Crne Gore. Program za smanjenje unosa soli hranom u Crnoj Gori 2017-2025. Podgorica; 2017.
26. Institut za javno zdravlje Crne Gore. Preporuke za smanjenje unosa hrane bogate zasićenim mastima, trans mastima, šećerima i solju. Podgorica; 2020. Dostupno na: <https://s3.eu-central-1.amazonaws.com/web.repository/ijzcg-media/files/1638792630-preporuke-za-smanjenje-unosa-hrane-bogate-zasicenim-mastima-trans-mastima-secerima-i-solju.pdf>
27. World Health Organization. Global sodium intake reduction recommendations. Geneva: WHO; 2012.
28. Worldwide trends in underweight and obesity from 1990 to 2022: a pooled analysis of 3663 population-representative studies with 222 million children, adolescents, and adults. *Lancet*. 2023.
29. Institut za javno zdravlje Crne Gore. Inicijativa za nadzor gojaznosti kod djece - COSI 2022. Podgorica; 2024. Dostupno na: <https://s3.eu-central-1.amazonaws.com/web.repository/ijzcg-media/files/1729699635-covid-cosi-izvjestaj-mne-2022-finalno.pdf>
30. Vasiljevic I, Petkovic J. The prevalence of overweight and obesity: a measurement-based analysis of 6-9-year-old school children from Montenegro. *Front Public Health*. 2023;11:1194600.
31. Martinovic M, Belojevic G, Evans GW, Lausevic D, Asanin B, Samardzic M, et al. Prevalence of and contributing factors for overweight and obesity among Montenegrin schoolchildren. *Eur J Public Health*. 2015;25(5):833-839.
32. Our World in Data. Death rate from obesity - Montenegro. Dostupno na: <https://ourworldindata.org/grapher/death-rate-from-obesity?tab=chart&country=MNE>
33. World Health Organization. Healthy diet. Geneva: WHO; [cited 2025 Jun 5]. Available from: <https://www.who.int/news-room/fact-sheets/detail/healthy-diet>
34. Vlada Crne Gore, Ministarstvo zdravlja, rada i socijalnog staranja. Strategija za prevenciju i kontrolu hroničnih nezaraznih bolesti. 2008. Dostupno na: <https://www.gov.me/dokumenta/8f83c1e0-1171-444f-8a77-9dd3d6c5632b> (pristupljeno 30.04.2024).

ELIMINACIJA TUBERKULOZE - DOSTIGNUĆA I IZAZOVI

TUBERCULOSIS ELIMINATION - ACHIEVEMENTS AND CHALLENGES

Maja Stošić¹

1 Institut za javno zdravlje Srbije „Dr Milan Jovanović Batut“, Beograd, Srbija

SAŽETAK

U 2023. godini, 7,8 miliona ljudi širom sveta novodijagnostikovano je sa tuberkulozom (TB), čime je TB ponovo postala vodeći uzrok smrti među zaraznim bolestima - nadmašivši COVID-19. Uprkos napretku u dijagnostici i lečenju, globalno opterećenje TB i dalje opada sporo, 1,5-2% godišnje. Na to utiču brojni faktori: velika baza osoba latentno inficiranih bacilom tuberkuloze bez manifestne aktivne bolesti, sve češći faktori rizika za endogenu reaktivaciju bolesti, globalno starenje populacije, sporo i nedovoljno otkrivanje slučajeva, niske stope izlečenja, rastuća otpornost na lekove i ko-infekcija sa HIV-om. Da bi se ostvario dalji napredak i eliminisala TB, neophodno je ubrzano ulaganje u inovacije. Prioriteti uključuju razvoj brzih dijagnostičkih testova koji se mogu koristiti na licu mesta, širu primenu digitalnih alata i veštačke inteligencije, stvaranje bezbednijih i efikasnijih lekova i kraćih režima lečenja, primenu vakcina za pre- i post-ekspoziciju, kao i povećanje dostupnosti novih alata i tehnologija u regionima sa najvećim opterećenjem.

Ključne reči: tuberkuloza; opterećenje bolesti; dijagnostika; inovacije u lečenju; strategije eliminacije

ABSTRACT

The reported global number of people newly diagnosed with TB was 7.8 million in 2023. Despite the progress in diagnosis and treatment, TB has returned to being the world's leading cause of death from a single infectious agent (replacing COVID-19).

During the past years, the TB burden has been slowly decreasing at a rate of 1.5-2% per year, due to many reasons: large TB infection pool, increasing risk factors for active disease, global ageing, slow and insufficient case detection, low cure rates, drug resistance and TB/HIV co-infection. To move towards further achievements and TB elimination, we need to accelerate development of new diagnostics, including new point-of-care tests for infection and disease, explore global digital health approaches, enhance artificial intelligence use, develop new drugs that are safer and easier to use, shorter treatment regimens, and effective pre- and post-exposure vaccines as well as transfer tools and technologies widely to the most affected.

Keywords: tuberculosis; achievements; challenges; elimination

INTRODUCTION

Even in the 21st century of dizzying growth and technology development, tuberculosis (TB) as an old disease still represent a major global health challenge, despite all the possibilities for prevention and management. Based on the latest data, it is the 13th leading cause of death worldwide. TB was the second leading infectious killer after coronavirus disease 2019 (COVID-19). However, despite this progress, TB has returned to being the world's leading cause of death from a single infectious agent (replacing COVID-19) [1,2].

The reported global number of people newly diagnosed with TB was 7.8 million in 2023. This is the highest number since WHO began global TB monitoring, above the pre-COVID baseline (and previous historical peak) of 7.6 million in 2022. The numbers in 2022 and 2023 probably includes a sizeable backlog of people who developed TB in previous years, but whose diagnosis and treatment was delayed by COVID-related disruptions that affected access to and provision of health services. India, Indonesia and the Philippines, which collectively accounted ≥60% of the global reductions in the number of people newly diagnosed with TB in 2020 and 2021, all recovered to above 2019 levels in 2022. Globally in 2023, TB caused an estimated 1.25 deaths, which is decline from the previous year when 1.3 million people died of TB.

Around 450 000 new cases worldwide are reported as multidrug-resistant TB (MDR-TB)/rifampicin-resistant TB. The highest MDR-TB rates are detected in Belarus, Russia and Moldova, with 38%, 35% and 33% of new TB cases, respectively, followed by Kyrgyzstan and Tajikistan with 29% and Kazakhstan and Ukraine with 27%, meaning that one out of three new TB cases are MDR-TB [2]. Although still a major concern, MDR-TB has remained stable in the past years, representing <5% of TB cases. Finally, 8% of TB cases globally are HIV-associated; three-quarters of these are found in Africa, with a high incidence also in Russia and Ukraine [2].

TB is caused by the bacillus *Mycobacterium tuberculosis*, which spread when people affected with TB expel bacteria into the air (by coughing, sneezing, singing or speaking loudly). As TB incidence declined globally over the years, the recent estimates showed that the quarter instead a third of the global population have been infected with TB [3]. Following infection, the risk of developing TB disease is highest in the first 2 years (approximately 5%), after which it is much lower [4]. Some people will clear the infection. The risk is higher among adults and adolescents living with HIV, household contacts (regardless of HIV status), people who are initiating anti-TNF treatment, receiving dialysis, preparing for an organ or haematological transplant, people who have silicosis, people with diabetes, engaged in the harmful use of alcohol, tobacco smokers and underweight people unless they also belong to other risk groups, prisoners, health workers, immigrants from countries with a high TB burden, homeless people and people who use drugs [3, 5, 6]. Of the total number of people who develop TB disease each year, about 90% are adults, with more cases among men than women. The disease typically affects the lungs (pulmonary TB) but can affect other sites as well [2].

Without treatment, the death rate from TB disease is high (about 50%) [7]. With treatments currently recommended by WHO (a 4-6 months course of anti-TB drugs), about 85% of people with TB can be cured. [8]. Regimens of 1-6 months are available to treat TB infection [3] but they are not widely used.

During the past years, the TB burden has been slowly decreasing at a rate of 1.5-2% per year [2], due to many reasons: large TB infection pool, increasing risk factors for active disease, global ageing, slow and insufficient case detection, low cure rates, drug resistance and TB/HIV co-infection. In addition, TB is closely linked to the social-economic determinants. The main vulnerable people are those living in poor, crowded and poorly ventilated conditions; those living with HIV, diabetes, malnutrition, alcohol abuse, and drug and tobacco use; and migrants, refugees, prisoners, ethnic minorities and marginalised populations. The higher the gross domestic product (GDP) the lower the TB incidence, whilst the higher the level of undernutrition, the higher the incidence [1,2]. Furthermore, major disruptive events like the pandemic and political conflicts greatly slow down the decline of TB burden [9].

The determinants affecting TB burden can be classified into three layers of challenges (figure 1) that can be addressed within national TB programmes, the general health sector and beyond health; the latter are faced through good performance of sectors addressing undernutrition, poor living conditions, discrimination and marginalisation [10].

Figure 1. Factors influencing vulnerabilities to illness



Source: Adapted from Bates I et al. Vulnerability to malaria, tuberculosis, and HIV/ AIDS infection and disease. Part I: Determinants operating at individual and household level. *Lancet Infectious Diseases*, 2004, 4:267-277

To end TB, a multi-sectoral approach involving all stakeholders, all government departments, the private sector, community engagement and survivor groups is necessary.

To decrease TB burden, global targets have been set within the End TB Strategy of the WHO, in line with the United Nations (UN) Sustainable Development Goals. Approved by the WHO's World Health Assembly in 2014, the Strategy aims to "end TB" by 2030/2035 [11], ensuring equitable access to high-quality diagnosis, treatment, care and prevention for everyone affected by TB, without the risk of incurring catastrophic expenditure or social repercussions. The Strategy is based on three pillars: 1) integrated, patient-centred care and prevention; 2) bold policies and supportive systems; and 3) intensified research and innovation. These pillars are built upon four fundamental principles to be respected by all countries adopting the Strategy: 1) government stewardship and accountability, with monitoring and evaluation; 2) building a strong coalition with civil society and communities; 3) protecting and promoting human rights, ethics and equity; and 4) adaptation of the strategy and targets at country level, with global collaboration.

Certain milestones are set to evaluate the progress towards the targets [11]. However they are far from being achieved [2]. Due to the disruptions caused by COVID-19, the situation has worsened, mortality increased in 2020-2022 compared to 2019. All targets to end TB are off track, except for that regarding people living with TB/HIV receiving TB preventive treatment [2].

CONCLUSION

To get back and move towards further achievements and elimination, we need to accelerate development of new diagnostics, including new point-of-care tests for infection and disease, explore global digital health approaches, enhance artificial intelligence use, develop new drugs that are safer and easier to use, shorter treatment regimens, and effective pre- and post-exposure vaccines as well as transfer tools and technologies widely to the most affected.

REFERENCES

1. Villar-Hernández R, Ghodousi A, Konstantynovska O, Duarte R, Lange C, Raviglione M. Tuberculosis: current challenges and beyond. *Breathe (Sheff)*. 2023 Mar;19(1):220166.
2. Global tuberculosis report 2024. Geneva: World Health Organization; 2024.
3. WHO consolidated guidelines on tuberculosis. Module 1: prevention - tuberculosis preventive treatment. Geneva: World Health Organization; 2020. Licence: CC BY-NC-SA 3.0 IGO.
4. Houben RMGJ, Dodd PJ. The Global Burden of Latent Tuberculosis Infection: A Re-estimation Using Mathematical Modelling. *PLOS Medicine*. 2016 Oct 25;13(10):e1002152.
5. Comstock GW, Livesay VT, Woolpert SF. The prognosis of a positive tuberculin reaction in childhood and adolescence. *Am J Epidemiol*. 1974 Feb;99(2):131-8.
6. Vynnycky E. Lifetime Risks, Incubation Period, and Serial Interval of Tuberculosis. *Am J Epidemiol*. 2000 Aug 1;152(3):247-63.
7. Report of a subgroup meeting of the WHO Task Force on TB Impact Measurement: methods used by WHO to estimate TB disease burden. Geneva: World Health Organization; 2022 (<https://apps.who.int/iris/handle/10665/363428>).
8. WHO consolidated guidelines on tuberculosis. Module 4: treatment - drug-susceptible tuberculosis treatment. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO.
9. Lodenkemper R, Murray JF. Tuberculosis and war: lessons learned from World War II. *Prog Respir Res* 2018; 43: 214-228. doi:10.1159/000481490
10. World Health Organization (WHO). Addressing Poverty in TB control - Options for National TB Control Programmes. WHO Regional Office for Europe, 2005. <https://www.who.int/teams/global-tuberculosis-programme/populations-comorbidities/social-determinants>
11. World Health Organization (WHO). The End TB strategy. WHO Regional Office for Europe, 2015.

IZAZOVI JEDNOG ZDRAVLJA U ZDRAVSTVENIM POLITIKAMA

ONE HEALTH CHALLENGES IN HEALTH POLICIES

Vesna Bjegović-Mikanović¹

1 Medicinski fakultet Beograd

SAŽETAK

Međusobna povezanost ljudi, životinja i životne sredine – dodatno pogoršana urbanizacijom, migracijama, klimatskim promenama, sukobima i prirodnim katastrofama – povećala je učestalost i složenost bioloških pretnji po zdravlje (1). Ovaj narativni pregled sagledava izazove i mogućnosti primene pristupa jednog zdravlja u nacionalnim i međunarodnim zdravstvenim politikama, naglašavajući njegovu sve veću važnost u prevenciji, detekciji i odgovoru na javnozdravstvene pretnje.

Tradicionalno usmeren na zoonoze i antimikrobnu rezistenciju, pristup jednog zdravlja danas obuhvata i nezarazne bolesti, ekološke rizike, bezbednost hrane i vode. Njegovi ključni principi – interdisciplinarna saradnja, holistički dijagnostički pristup, održive prakse, prevencija bolesti i globalna perspektiva – redefinišu način na koji zdravstveni sistemi treba da sarađuju sa različitim sektorima. Uprkos političkim deklaracijama, operacionalizacija jednog zdravlja u okviru zdravstvene politike i dalje je otežana (2). Fragmentacija upravljanja, nedostatak integrisanih sistema nadzora, nedovoljna stručna obuka i ograničena međusektorska saradnja ostaju veliki izazovi (3). Nedovoljna uključenost ovog pristupa u medicinsko obrazovanje i kliničku praksu dodatno otežava ranu detekciju i koordinisani odgovor na novonastale pretnje. Pandemija COVID-19 dodatno je ukazala na potrebu za usklađenim delovanjem između aktera iz oblasti ljudskog, veterinarskog i ekološkog zdravlja. Pregled obuhvata primere međunarodnih inicijativa usmerenih na suzbijanje antimikrobne rezistencije, zoonoza, zanemarenih tropskih bolesti, bolesti koje prenose vektori i uticaja klimatskih promena na zdravlje. Zajednički akcioni plan SZO, FAO, UNEP i WOA (2022-2026) (4) definiše šest strateških pravaca delovanja, uključujući prevenciju zoonoza, bezbednost hrane i integraciju životne sredine. Globalni dokumenti kao što su Međunarodni zdravstveni pravilnik i dokumenti posvećeni ciljevima održivog razvoja (posebno SDG 3 i SDG 6) pružaju politički okvir za implementaciju pristupa jednog zdravlja (5,6). Takođe, mnoge zemlje, kao što je Srbija, obezbeđuju ovaj okvir u nacionalnim dokumentima (7). Izazovi kao što su iracionalna upotreba antibiotika kod ljudi i životinja, porast bolesti koje prenose vektori usled ekoloških promena, kao i neadekvatna infrastruktura za vodu i sanitarije, ukazuju na potrebu za jedinstvenim sistemima nadzora i odgovora. To je naročito važno u regionima sa slabijim zdravstvenim sistemima i ranjivim populacijama, gde zoonotski prelazi predstavljaju nesrazmeran rizik (8).

Zaključak: Unapređenje pristupa jednog zdravlja u politikama zahteva ulaganje u interdisciplinarno obrazovanje, povezivanje kliničke medicine sa javnim i ekološkim zdravljem, jačanje dijagnostičkih kapaciteta i razmenu podataka, kao i fleksibilne regulatorne okvire. Institucionalizacija Jednog zdravlja u okviru javnozdravstvenih strategija je ključna za jačanje spremnosti na pandemije, bezbednost hrane i vode, zaštitu životne sredine i pravičan pristup zdravstvenim uslugama.

Ključne reči: jedno zdravlje, zdravstvena politika, međusektorska saradnja, zoonoze, antimikrobna rezistencija, sistemi javnog zdravlja.

ABSTRACT

The interconnectedness of humans, animals, and the environment—exacerbated by urbanization, migration, climate change, conflicts, and natural disasters—has intensified the emergence and spread of biological threats to health (1). This narrative review explores the challenges and opportunities of embedding the One Health approach into national and international health policies, emphasizing its growing relevance in preventing, detecting, and responding to public health threats.

Traditionally focused on zoonoses and antimicrobial resistance, the One Health paradigm now extends its scope to non-communicable diseases, environmental health hazards, and food and water safety. Its core principles—interdisciplinary collaboration, holistic diagnostics, sustainable practices, disease prevention and surveillance, and a global perspective—have reshaped how public health systems must engage with diverse sectors. Despite political commitments, operationalizing One Health within health policy remains difficult (2). Governance fragmentation, lack of integrated surveillance systems, insufficient professional training, and limited cross-sectoral collaboration are persistent obstacles (3). The limited incorporation of One Health principles into medical education, clinical practice, and veterinary services hinders early detection and coordinated response to emerging threats. Moreover, the COVID-19 pandemic has underscored the need for synchronized action between human, animal, and environmental health actors. Through case studies and international frameworks, the review highlights initiatives that address antimicrobial resistance, zoonoses, neglected tropical diseases, vector-borne infections, and climate-sensitive health outcomes. The WHO, FAO, UNEP, and WOA Joint Plan of Action (2022-2026) (4) outlines six strategic pathways to strengthen One Health implementation, including zoonosis prevention, food safety, and environmental integration. Furthermore, global policy instruments such as the International Health Regulations and the Sustainable Development Goals (particularly SDG 3 and SDG 6) provide a policy scaffold for One Health action (5,6). Additionally, many countries, such as Serbia, incorporate this framework into their national documents (7). Challenges, antimicrobial misuse in humans and animals, the rising incidence of vector-borne diseases due to ecological shifts, and inadequate water and sanitation infrastructure highlight the importance of a unified surveillance and response system. This is particularly relevant in regions with fragile health systems and vulnerable populations, where zoonotic spillovers and emerging infections pose a disproportionate risk (8).

Conclusion: The review highlights that advancing One Health in policy requires investments in interdisciplinary education, the integration of clinical medicine with public and environmental health, capacity building in diagnostics and data sharing, and flexible regulatory frameworks. Institutionalizing One Health within public health strategies is essential for enhancing pandemic preparedness, food and water safety, environmental protection, and equitable access to health services.

Keywords: One Health, health policy, intersectoral collaboration, zoonoses, antimicrobial resistance, public health systems.

ZNAČAJ NACIONALNE „VAKCINALNE NEZAVISNOSTI“

THE IMPORTANCE OF NATIONAL “VACCINE INDEPENDENCE”

Darija Kisić^{1,2}, Marija Milić³

1 Institut za epidemiologiju, Medicinski fakultet, Univerzitet u Beogradu

2 Institut za virusologiju, vaccine i serume “Torlak”

3 Institut za epidemiologiju, Medicinski fakultet u Kosovskoj Mitrovici

SAŽETAK

U savremenom svetu gde se zarazne bolesti šire brže nego ikada, imunizacija ostaje naša najsnažnija odbrana. Vakcinacija je most koji povezuje iskustva prošlih pandemija sa nadom u budućnost bez epidemija - zasnovana na znanju, solidarnosti i pravovremenoj zaštiti. Međutim, globalne krize poput pandemije COVID-19, geopolitičkih tenzija i poremećaja u lancima snabdevanja pokazale su koliko su države koje zavise od uvoza vakcina ranjive, naročito u vanrednim situacijama. U tom kontekstu, koncept „vakcinalne nezavisnosti“ postaje ne samo strateško, već i pitanje nacionalne bezbednosti.

„Vakcinalna nezavisnost“ podrazumeva sposobnost jedne države da razvija, proizvodi i distribuira vaccine za sopstvene potrebe. Osim što omogućava pravovremen i adekvatan odgovor na izbijanje epidemija, ona doprinosi stabilnosti zdravstvenog sistema, jačanju poverenja građana, ekonomskom razvoju i naučnoj autonomiji. Institut za virusologiju, vaccine i serume „Torlak“, sa tradicijom dugom jedan vek, predstavlja stub vakcinalne bezbednosti Srbije i regiona. Obnova i modernizacija kapaciteta Instituta omogućila je ponovno pozicioniranje Srbije kao značajnog aktera u regionalnoj vakcinalnoj politici. Tokom poslednjih godina, kroz strateška ulaganja i modernizaciju, Institut je napravio iskorak ka savremenim biotehnoškim kapacitetima koji omogućavaju brži i efikasniji odgovor na izazove savremenih epidemija. Posebno važan iskorak predstavlja izgradnja pogona za RNK (iRNK) tehnologiju, čime se Srbija svrstava među retke zemlje koje razvijaju i implementiraju ovu najsavremeniju platformu za proizvodnju vakcina nove generacije. Ova tehnologija omogućava brzu prilagodljivost u razvoju vakcina protiv novih sojeva virusa, što je od presudnog značaja u svetu brzih mutacija i pandemijskih pretnji. Pored toga, u okviru Instituta Torlak izgrađena je nova dijagnostička zgrada najvišeg bezbednosnog nivoa - BSL3, koja omogućava rad sa visoko patogenim mikroorganizmima. Time je značajno ojačan kapacitet za pravovremenu i preciznu laboratorijsku dijagnostiku zaraznih bolesti, ali i za razvoj i kontrolu bioloških preparata u skladu sa najvišim međunarodnim standardima.

Nacionalna „vakcinalna nezavisnost“ je oslonac zdravstvene bezbednosti svake države. Ona se ne gradi preko noći, već zahteva dugoročnu strategiju, političku volju i ulaganje u naučno-istraživačku i proizvodnu infrastrukturu. Očuvanje i jačanje institucija poput Instituta Torlak od presudne je važnosti za osiguranje dostupnosti vakcina, ali i za jačanje međunarodne saradnje i uloge Srbije u globalnim zdravstvenim okvirima.

Ključne reči: vaccine, vakcinalna nezavisnost, Institut Torlak, javno zdravlje, zdravstvena bezbednost, Srbija

ABSTRACT

Nowadays, where infectious diseases spread faster than ever, immunization remains our most powerful defense. Vaccination is the bridge that connects the experiences of past pandemics with the hope for a future free from epidemics - grounded in knowledge, solidarity, and timely protection. However, global health crises such as the COVID-19 pandemic, geopolitical tensions, and disruptions in supply chains have revealed how vulnerable countries that rely on vaccine imports can be, especially in emergencies. In this context, the concept of “vaccine independence” becomes not only a strategic imperative but also a matter of national security.

“Vaccine independence” refers to a country’s ability to develop, produce, and distribute vaccines for its own needs. Beyond enabling a timely and adequate response to disease outbreaks, it contributes to the stability of the healthcare system, strengthens public trust, supports economic development, and fosters scientific autonomy. The Institute for Virology, Vaccines and Sera “Torlak,” with a tradition spanning over a century, stands as a pillar of vaccine security for Serbia and the wider region. The renewal and modernization of the Institute’s capacities have enabled Serbia to reposition itself as a significant factor in regional vaccine policy. In recent years, through strategic investments and modernization efforts, the Institute has taken an increase toward advanced biotechnological capabilities, enabling faster and more efficient responses to the challenges of modern epidemics.

A particularly important milestone is the establishment of a facility for RNA (mRNA) technology, placing Serbia among the rare countries developing and implementing this state-of-the-art platform for next-generation vaccine production. This technology allows for rapid adaptability in developing vaccines against emerging virus strains, which is crucial in a world of fast mutations and pandemic threats. Additionally, Torlak has built a new diagnostic facility with the highest biosafety level - BSL-3 - enabling work with highly pathogenic microorganisms. This has significantly enhanced the capacity for timely and accurate laboratory diagnostics of infectious diseases, as well as for the development and quality control of biological products in accordance with the highest international standards.

National “vaccine independence” is the core stone of any country’s health security. It is not built overnight; it requires a long-term strategy, political will, and investments in scientific research and production infrastructure. Preserving and strengthening institutions such as the Torlak Institute is of vital importance not only for ensuring vaccine availability but also for bolstering international cooperation and Serbia’s role in global health frameworks.

Keywords: vaccines, vaccine independence, Torlak Institute, public health, health security, Serbia

NEJEDNAKOSTI U ZDRAVLJU KROZ PRIZMU NEOSTVARENIH ZDRAVSTVENIH POTREBA STARIH

INEQUALITIES IN HEALTH THROUGH THE PRISM OF UNMET HEALTH NEEDS OF THE ELDERLY

Sanja Kocić^{1,3}, Nikola Savić⁴, Aleksandra Arnaut²

1 Univerzitet u Kragujevcu, Srbija, Fakultet medicinskih nauka, Katedra Socijalne medicine

2 Univerzitet u Kragujevcu, Srbija, Fakultet medicinskih nauka, Katedra za Stomatologiju

3 Institut za javno zdravlje Kragujevac

4 Fakultet poslovnih i zdravstvenih studija, Univerzitet Singidunum

SAŽETAK

Uvod: Ne postoji standardna, operativna definicija nezadovoljenih potreba za zdravstvenom zaštitom koja bi omogućila globalno praćenje i uporedivost između zemalja. Jedna od definicija je da one predstavljaju razliku između zdravstvenih usluga koje se smatraju neophodnim za određeni zdravstveni problem i usluga koje su stvarno dobijene.

Uprkos važnosti obezbeđivanja prava ljudi na zdravlje, trenutni načini merenja kvaliteta zdravstvenih usluga ne uključuju merenje nezadovoljenih zdravstvenih potreba. Na 76. Skupštini Svetske zdravstvene organizacije (SZO) (2023.), usvojena je rezolucija kojom se zahteva od generalnog direktora SZO da preispita važnost i izvodljivost korišćenja nezadovoljenih potreba za zdravstvenim uslugama kao dodatnog indikatora za praćenje univerzalne zdravstvene pokrivenosti, na nacionalnom i globalnom nivou.

Cilj istraživanja je uporedna analiza neostvarenih potreba u populaciji starih u zemljama evropskog regiona, kao i analiza prediktora neostvarenih zdravstvenih potreba populacije starih u Republici Srbiji (RS).

Metod: Kao izvor podataka korišćeno je EU-SILC (Survey on Income and Living Conditions) istraživanje koje se sprovodi u svim zemljama Evropske unije (EU), kao i podaci iz Nacionalnog istraživanja zdravlja stanovništva, sprovedenog 2019. godine u RS u populaciji stanovništva 65 i više godina.

Rezultati istraživanja. U 2023. godini, 3,8% ljudi starosti 16 godina i više u EU imalo je nezadovoljene potrebe za lekarskim pregledom ili lečenjem. Iz razloga vezanih za organizaciju i pružanje zdravstvenih usluga (preskupe usluge, predaleko putovanje ili liste čekanja), 2,4% ljudi u EU je imalo nezadovoljene zdravstvene potrebe, a taj udeo se kretao od 0,1% na Kipru i Malti do 11,6% u Grčkoj i 12,9% u Estoniji.

U EU postoji pozitivna korelacija između starosne dobi i neostvarenih zdravstvenih potreba, ali to nije slučaj u svakoj zemlji pojedinačno.

Primer pozitivne korelacije je Grčka, gde je udeo najstarije dobnе grupe sa neostvarenim potrebama bio skoro 30 procentnih poena veći nego udeo najmlađe dobnе grupe (16-44 godina). Suprotnost je Danska gde neostvarene potrebe dominiraju u najmlađoj starosnoj grupi, ali sa mnogo manjim opsegom razlike.

Prema rezultatima poslednjeg Nacionalnog istraživanja zdravlja stanovnika RS, 32% stanovnika starosti 65 i više godina nije ostvarilo potreban oblik zdravstvene zaštite. Najčešći razlozi neostvarenih potreba su finansijski razlozi, potom liste čekanja, a zatim udaljenost i problemi sa prevozom. Finansijske probleme kao uzrok neostvarenih potreba u 2013. godini navelo je 16,1% ispitanika starih 65 i više godina i 23,2% u 2019. Uočeni porast broja ispitanika kod kojih je izostala potrebna zdravstvena zaštita usled finansijskih poteškoća statistički je značajan ($p < 0,05$).

Loše materijalno stanje, muški pol, region Vojvodine i Beograda, loše zdravstveno stanje (samoprocena), prisustvo hroničnog poremećaja zdravlja, nezgode u kući u proteklih mesec dana, bolovi koji uzrokuju ograničenja u obavljanju uobičajenih aktivnosti, korišćenje usluga dnevne bolnice, hitne medicinske pomoći i usluga tradicionalne medicine, predstavljaju prediktore neostvarenih zdravstvenih potreba stanovništva starosti 65 i više godina u Republici Srbiji.

Zaključak: Neostvarene zdravstvene potrebe su važan pokazatelj nejednakosti u zdravlju i mogu se koristiti kao dopuna standardnim metodama u proceni nejednakosti na nacionalnom i lokalnom nivou. One mogu dovesti do lošijih zdravstvenih ishoda, naročito najugroženijeg dela populacije, do visoke zdravstvene potrošnje i gubitka produktivnosti za pojedince i društvo.

Ključne reči: Neostvarene zdravstvene potrebe, populacija starih, nejednakosti u zdravlju

ABSTRACT

Introduction: There is no standardized, operational definition of unmet health care needs that would enable consistent global monitoring or comparisons across countries. One general definition describes these needs as the gap between necessary health services for a particular health problem and the services received.

Although securing the right to health is essential, current methods for assessing health care quality do not include unmet needs. At the 76th World Health Assembly in 2023, the WHO adopted a resolution requesting its Director-General to evaluate the relevance and feasibility of using unmet health care needs as an additional indicator for tracking universal health coverage at national and international levels.

The goal of the research is a comparative analysis of unmet needs in the elderly population in the countries of the European region, as well as an analysis of predictors of unmet health needs of the elderly population in the Republic of Serbia (RS).

Methods. Data were collected from the EU-SILC (Survey on Income and Living Conditions), conducted in all EU countries, and the 2019 National Health Survey in Serbia, focusing on individuals aged 65 and older.

Research Results. In 2023, 3.8% of people aged 16 and over in the EU had an unmet need for medical examination or treatment. When looking at access-related barriers (such as high costs, long distances, or waiting lists), 2.4% had unmet needs. This share ranged from 0.1% in Cyprus and Malta to 11.6% in Greece and 12.9% in Estonia.

Generally, in the EU, unmet needs tend to increase with age, although this pattern varies by country. An example of a positive correlation is Greece, where the share of the oldest age group with unmet needs was almost 30 percentage points higher than the share of the youngest age group (16-44 years). The opposite is Denmark, where unmet needs dominate in the youngest age group, but with a much smaller range of difference.

According to the results of the last National Health Survey of RS residents, 32% of residents aged 65 and over did not receive the required form of health care. The most common reasons for unmet needs are financial reasons, followed by waiting lists, and then distance and transportation problems. Financial problems as the cause of unfulfilled needs in 2013 were cited by 16.1% of respondents aged 65 and over and 23.2% in 2019 ($p < 0.05$).

Factors predicting unmet health needs among older adults in Serbia include poor financial condition, male gender, residence in Vojvodina or Belgrade, poor self-rated health, presence of chronic illnesses, recent household accidents, activity-limiting pain, and prior use of day hospitals, emergency care, or traditional medicine.

Conclusion. Unmet health needs are a valuable indicator of health inequality and can complement standard tools for assessing disparities at national and local levels. They are associated with poorer health outcomes, especially for vulnerable populations, and contribute to higher health expenditures and decreased productivity at both the individual and societal levels.

Keywords: Unmet health needs, elderly population, health inequalities

RAZVOJ LIDERSTVA ZA TRENERE JAVNOG ZDRAVLJA U MEGHALAJI, INDIJA - ANALIZA POTREBA ZA OBUKOM

LEADERSHIP DEVELOPMENT FOR PUBLIC HEALTH TRAINERS IN MEGHALAYA, INDIA - A TRAINING NEEDS ANALYSIS

Dipika Bumb
Ramaiah International Centre for Public Health Innovations, India

SAŽETAK

Efikasno vodstvo u javnom zdravstvu ostaje ključna, ali nedovoljno istražena dimenzija u jačanju zdravstvenih sistema u uslovima ograničenih resursa. Vlada Meghalaje predviđa tranziciju Regionalnog centra za obuku u oblasti zdravstva i porodične zaštite (RHFUTC) u nodalni centar na državnom nivou za razvoj zdravstvene radne snage. Ova strateška vizija ima za cilj da osnaži fakultet RHFUTC-a kao ključne donosiocje odluka i leaderske oslonce u obrazovanju i izgradnji kapaciteta u oblasti javnog zdravlja. Ostvarivanje ove ambicije zahteva jačanje njihovih kompetencija izvan rutinskog pružanja obuke, posebno identifikujući njihov stil vodstva, emocionalnu inteligenciju, sistemsko razmišljanje, otpornost i stratešku komunikaciju, između ostalog. Takođe je potrebna međusektorska saradnja sa akademskim institucijama i državnim zdravstvenim sistemima poput Nacionalne zdravstvene misije (NHM) i kaskada liderskih kompetencija za zdravstvene radnike na nivou lokalnih zajednica i okruga. Program LEAD-PHT (Obogaćivanje i razvoj liderstva za trenere javnog zdravlja) je osmišljen primenom Kernovog okvira od šest koraka u tri faze, naime, Analiza potreba za obukom: Razvoj i implementacija kurikuluma i evaluacija. Na ovoj konferenciji fokusiramo se na dizajn i ključne nalaze Analize potreba za obukom (ATP). Ona je sprovedena kao prvi korak u ovom transformativnom putovanju, koristeći istraživački sekvencijalni mešoviti dizajn metoda. Ovaj dizajn je obuhvatio niz studija: (1) opsežan pregled globalne i nacionalne literature (2) Detaljne intervjue sa ključnim informatorima i potencijalnim učesnicima radi istraživanja perspektiva zainteresovanih strana; (3) anketu o spremnosti i samoeфикаsnosti među nastavnicima RHFUTC i instruktorima okružnih medicinskih sestara (DNI); (4) vežbe mapiranja kompetencija; i (5) validaciju Okvira liderskih kompetencija i strategija razvoja kurikuluma putem modifikovane e-Delphi tehnike.

Studija je identifikovala nekoliko praznina u istraživanju: ograničene empirijske dokaze o liderskim kompetencijama koje su potrebne zdravstvenim trenerima u Indiji; odsustvo kontekstualno specifičnih, kulturno odgovornih programa za razvoj liderstva; i nedostatak strukturirane implementacije i evaluacije. Prethodna literatura se pretežno fokusirala na liderstvo za lekare i službenike srednjeg nivoa, zanemarujući mikrosisteme u kojima se obuka i mentorstvo odvijaju u praksi.

Rezultati ATP su direktno uticali na strukturu, sadržaj i pedagoški pristup konačnog kurikuluma. Ispitanici su identifikovali uočene nedostatke u sistemskom razmišljanju, međuljudskoj komunikaciji, upravljanju timom i rešavanju problema. Postojala je snažna prednost za strategije iskustvenog učenja kao što su diskusije slučajeva, igranje uloga, mentorstvo i aktivnosti uz podršku vršnjaka u odnosu na tradicionalne formate predavanja. Ovo je omogućilo davanje prioriteta kompetencijama na osnovu uočenih potreba i kontekstualne relevantnosti; istovremeno usmeravajući ciljeve u pogledu kompetencija, praćenje i evaluaciju programa. Ova formativna faza je uticala na zajednički dizajn kurikuluma za liderstvo za trenere javnog zdravlja, zasnovanog na dokazima i kontekstu, relevantnog za druga okruženja sa niskim i srednjim prihodima koja se suočavaju sa sličnim sistemskim ograničenjima.

ABSTRACT

Effective public health leadership remains a critical yet an underexplored dimension in health systems strengthening within resource-constrained settings. The Government of Meghalaya envisions transition of the Regional Health and Family Welfare Training Centre (RHFUTC) into a state-level nodal centre for health workforce development. This strategic vision aims to empower RHFUTC faculty as critical decision-makers and leadership anchors in public health education and capacity-building. Realizing this ambition requires strengthening their competencies beyond routine training delivery, specifically identifying their leadership style, emotional intelligence, systems thinking, resilience and strategic communication among others. It also necessitates cross-sectoral collaboration with academic institutions and state health systems like the National Health Mission (NHM) and the cascade of leadership competencies to healthcare providers at both grassroots and district levels. A LEAD-PHT (Leadership Enrichment and Development for Public Health Trainers) program was conceptualised applying Kern's Six Step Framework in three phases, namely, Training Needs Analysis: Curriculum Development and Implementation and Evaluation. In this conference we are focusing on the design and key findings from the Training Needs Analysis (TNA). It was undertaken as the first step in this transformative journey, employing an exploratory sequential mixed methods design. This design included a series of studies: (1) extensive global and national literature review (2) In-depth interview with key informant interviews and potential participants to explore stakeholder perspectives; (3) a willingness and self-efficacy survey among RHFUTC faculty and District Nurse Instructors (DNIs); (4) competency mapping exercises; and (5) validation of the Leadership Competency Framework and curriculum development strategies through a modified e-Delphi technique.

The study identified several research gaps: limited empirical evidence on leadership competencies required by health trainers in India; absence of context-specific, culturally responsive leadership development programs; and lack of structured implementation and evaluation. Prior literature has predominantly focused on leadership for physicians and mid-level officials, neglecting the micro-systems where training and mentorship unfold in practice.

The TNA outcomes directly informed the structure, content, and pedagogical approach of the final curriculum. Respondents identified perceived gaps in systems thinking, interpersonal communication, team management, and problem-solving. There was a strong preference for experiential learning strategies like case discussions, role plays, mentoring, and peer-supported activities over traditional lecture formats. This enabled prioritization of competencies based on both perceived need and contextual relevance; while also guiding competency wise objectives, monitoring and evaluation for the program. This formative phase informed the co-design of an evidence informed and contextually grounded leadership curriculum for public health trainers relevant for other low- and middle-income settings facing similar systemic constraints.

COVID-19 I KARDIOVASKULARNE BOLESTI

COVID-19 AND CARDIOVASCULAR DISEASE

Biljana Mijović¹

¹ Univerzitet u Istočnom Sarajevu Medicinski fakultet Foča

SAŽETAK

COVID-19 se vrlo brzo tokom 2020. godine raširio širom svijeta. Vrlo brzo stručnjaci su zaključili da pacijenti sa pratećim kardiovaskularnim oboljenjem imaju težu kliničku sliku COVID-19. Takođe su vrlo brzo sagledali da su kardiovaskularna oboljenja i komplikacije COVID-19. Ovaj pregledni rad ima za cilj da sagleda povezanost COVID-19 sa pojavom kardiovaskularnih bolesti.

Razvoj kardiovaskularnih neželjenih događaja nastaje kao posljedica interakcije između virusa i njegovog receptora, inflamatornih faktora, različitih oblika stresnog odgovora, hipoksičnog okruženja i primjene lijekova. Analiza literature ukazuje da su najčešće kardiovaskularne komplikacije među pacijentima hospitalizovanim sa COVID-19 srčana insuficijencija, miokarditis, srčane aritmije i akutni koronarni sindrom. Literatura takođe ukazuje da je vakcinacija protiv COVID-19 smanjila rizik od srčanih i tromboembolijskih ishoda nakon COVID-19.

Zaključak: COVID-19 je često praćen kardiovaskularnim oboljenjima. Rana identifikacija i praćenje srčanih komplikacija mogu dovesti do povoljnijih ishoda. Vakcinacija protiv COVID-19 smanjuje rizik od ovih komplikacija

Ključne riječi: pandemija COVID-19, kardiovaskularne komplikacije, vakcine protiv COVID-19

ABSTRACT

During 2020, COVID-19 spread very quickly around the world. Very quickly, experts concluded that patients with accompanying cardiovascular disease have a more severe clinical picture of COVID-19. They also quickly realized that cardiovascular diseases and complications of COVID-19. This review paper aims to look at the association of COVID-19 with the occurrence of cardiovascular diseases.

The development of cardiovascular adverse events occurs as a consequence of the interaction between the virus and its receptor, inflammatory factors, various forms of stress response, hypoxic environment and the use of drugs. An analysis of the literature indicates that the most common cardiovascular complications among patients hospitalized with COVID-19 are heart failure, myocarditis, cardiac arrhythmias, and acute coronary syndrome. The literature also indicates that vaccination against COVID-19 reduced the risk of cardiac and thromboembolic outcomes after COVID-19.

Conclusion: COVID-19 is often accompanied by cardiovascular diseases. Early identification and monitoring of cardiac complications can lead to more favorable outcomes. Vaccination against COVID-19 reduces the risk of these complications

Key words: COVID-19 pandemic, cardiovascular complications, vaccines against COVID-19

KAKO JE COVID-19 PROMJENIO MAPU ANTIMIKROBNE REZISTENCIJE U CRNOJ GORI

HOW COVID-19 CHANGED THE ANTIMICROBIAL RESISTANCE MAP IN MONTENEGRO

Gordana Mijović¹, Maja Raičević², Milena Lopičić³

1 MedicinskifakultetUniverziteta Crne Gore, Podgorica, Crna Gora

2 Institut za bolestidjeceKliničkogcentra Crne Gore, Podgorica, Crna Gora

3 Institut za javno zdravlje Crne Gore, Podgorica, Crna Gora

SAŽETAK

Nedvosmisleno je dokazano da je glavni pokretač razvoja i širenja rezistencije bakterija na antibiotike: generacionalna i prekomerna upotreba antibiotika (1). Iako su podaci pokazali da je kod manje od 10% hospitalizovanih i ambulantnih pacijenata s COVID-19 širom sveta dijagnostikovana sekundarna bakterijska infekcija koja zahteva terapiju antibioticima, procenjuje se da je 75% pacijenata dobilo antibiotik na recept (2-7).

U ovom istraživanju ispitivali smo uticaj pandemije COVID-19 u Crnoj Gori na rezistenciju najčešćih Gram „-“ invazivnih izolata važnih patogena, kao i patogenih Gram „+“ bakterija na ključne antibiotike, uzimajući u obzir već prisutnu prekomernu upotrebu antibiotika u zemlji (8).

Analizirani su podaci Instituta za javno zdravlje Crne Gore o rezistenciji Gram „-“ invazivnih izolata važnih patogena (*Klebsiella pneumoniae*, *Escherichia coli*) i Gram „+“ bakterija (*Staphylococcus aureus*, *Streptococcus pyogenes*) na ključne antibiotike u periodu od 2019. do 2023. godine, te upoređeni sa podacima Crnogorskog Instituta za lekove i medicinska sredstva o potrošnji antibiotika u predpandemijskim (2019.) i pandemijskim godinama (2020, 2021 i 2022).

Rezultati su pokazali da je rezistencija *Escherichia coli* na cefalosporine III generacije porasla sa 38% u 2019. na 67% u 2022. godini. Stopa rezistencije *Klebsiella pneumoniae* na fluorohinolone je narasla sa 48% (2019) na 75% (2021), dok se rezistencija na karbapeneme povećala sa 17% (2019) na 47% (2022). Takođe, zabeležen je porast rezistencije *Staphylococcus aureus*-a na makrolide sa 11% u 2019. na 18% u 2022. godini. Kod *Streptococcus pyogenes*, rast rezistencije na makrolide u 2023. godini bio je na granici statističke značajnosti u poređenju sa 4% u 2019. i 2022. godini. Analiza potrošnje antibiotika ukazuje da se trend porasta rezistencije kod ispitivanih bakterija može dovesti u vezu s promenama u upotrebi određenih antibiotika tokom pandemije. Naime, podaci ukazuju da je tokom pandemije COVID-19 porasla ukupna upotreba ceftriaksona (sa 1,03 u 2019. na 2,57 DDD/1000/dan u 2021) i ciprofloxacina (sa 1,74 u 2019. na 2,92 DDD/1000/dan u 2021). U bolničkoj potrošnji zabeležen je porast potrošnje karbapenema sa 0,05 DDD/1000/dan u 2019. na 0,21 DDD/1000/dan u 2021, a ukupna potrošnja azitromicina je porasla sa 2,59 DDD/1000/dan (2019) na 6,19 DDD/1000/dan (2022).

Na osnovu prikazanih podataka može se zaključiti da je pandemija COVID-19 izmenila mapu rezistencije važnih patogena na ključne antibiotike u Crnoj Gori, dodatno podstičući praksu prekomerne i iracionalne upotrebe antibiotika. Ovakav trend rezistencije ukazuje na hitnu potrebu za razvijanjem sveobuhvatnog nacionalnog programa racionalne upotrebe antibiotika, kako bi se sprečili dalji negativni ishodi i suočavanje sa novim izazovima.

ABSTRACT

It has been unequivocally proven that the main driver of the development and spread of bacterial resistance to antibiotics is their irrational and excessive use (1). Although data show that fewer than 10% of hospitalized and outpatient COVID-19 patients worldwide were diagnosed with a secondary bacterial infection requiring antibiotic therapy, it is estimated that 75% of patients received a prescription for antibiotics (2-7).

In this study, we examined the impact of the COVID-19 pandemic on the resistance of the most common Gram-negative invasive isolates of important pathogens, as well as pathogenic Gram-positive bacteria to key antibiotics in Montenegro, taking into account the already existing overuse of antibiotics in the country (8).

Data from the Institute of Public Health of Montenegro on the resistance of Gram-negative invasive isolates of important pathogens (*Klebsiellapneumoniae*, *Escherichia coli*) and Gram-positive bacteria (*Staphylococcus aureus*, *Streptococcus pyogenes*) to key antibiotics from 2019 to 2023 were analyzed and compared with data from the Montenegrin Institute for Medicines and Medical Devices on antibiotic consumption in the pre-pandemic year (2019) and the pandemic years (2020, 2021, and 2022).

The results showed that resistance of *Escherichia coli* to third-generation cephalosporins increased from 38% in 2019 to 67% in 2022. The resistance rate of *Klebsiellapneumoniae* to fluoroquinolones rose from 48% (2019) to 75% (2021), while resistance to carbapenems increased from 17% (2019) to 47% (2022). There was also a recorded increase in resistance of *Staphylococcus aureus* to macrolides from 11% in 2019 to 18% in 2022. For *Streptococcus pyogenes*, the increase in resistance to macrolides to 8% in 2023 was at the borderline of statistical significance compared to 4% in both 2019 and 2022. Analysis of antibiotic consumption suggests that this trend of increasing resistance among the studied bacteria may be associated with changes in the use of certain antibiotics during the pandemic. Specifically, data indicate that the overall use of ceftriaxone increased from 1.03 DDD/1000/day in 2019 to 2.57 in 2021, and ciprofloxacin from 1.74 in 2019 to 2.92 DDD/1000/day in 2021. Hospital use of carbapenems rose from 0.05 DDD/1000/day in 2019 to 0.21 in 2021, and overall consumption of azithromycin increased from 2.59 DDD/1000/day (2019) to 6.19 DDD/1000/day (2022).

Based on the presented data, it can be concluded that the COVID-19 pandemic altered the resistance map of important pathogens to key antibiotics in Montenegro, further encouraging the practice of inappropriate and overuse of antibiotics. This resistance trend indicates an urgent need to develop a comprehensive national antibiotic stewardship program, to prevent further negative outcomes and to address emerging challenges.

AKTUELNI IZAZOVI U ODRŽAVANJU REPRODUKTIVNOG ZDRAVLJA ŽENA

CURRENT CHALLENGES IN MAINTAINING THE REPRODUCTIVE HEALTH OF WOMEN

Jelena Dotlić^{1,2}, Marija Milić³

1 Klinika za ginekologiju i akušerstvo, Univerzitetski klinički centar Srbije

2 Medicinski fakultet, Univerzitet u Beogradu, Beograd, Srbija

3 Odeljenje za epidemiologiju, Medicinski fakultet, Univerzitet u Prištini sa privremenim sedištem u Kosovskoj Mitrovici, Kosovska Mitrovica, Kosovo, Srbija

SAŽETAK

Uvod: Žensko reproduktivno zdravlje podrazumeva dobro stanje reproduktivnog sistema tokom celog života žene, uključujući fizičke, mentalne i socijalne aspekte. Čak i u 21. veku brojne žene širom sveta nemaju adekvatnu ginekološku i akušersku zdravstvenu zaštitu. Razlike kod žena u odnosu na muškarce postoje u pogledu seksualno prenosivih infekcija, nasilja zasnovanog na polu i neželjene trudnoće.

Pregled: Aktuelni izazovi u zaštiti reproduktivnog zdravlja žena uključuju brojna benigna ginekološka stanja kao što su endometrioza, miomi, disfunkcija jajnika i drugi hormonski poremećaji, uključujući sindrom policističnih jajnika i infekcije, uključujući seksualno prenosive infekcije. Ova stanja su česta i mogu izazvati nelagodnost, bol, menstrualne nepravilnosti i dovesti do neplodnosti i drugih zdravstvenih problema. Neplodnost pogađa značajan procenat žena i može imati dubok uticaj na njihovo emocionalno i fizičko blagostanje. Ipak, sva ova benigna stanja mogu biti nedovoljno dijagnostikovana, što dovodi do odloženog lečenja i povećane patnje žena. Još jedna grupa ginekoloških bolesti koje ne samo da mogu uticati na blagostanje, već i povećati smrtnost žena su ginekološki maligniteti (rak jajnika, endometrija, grlića materice, vulve i vagine).

Pored bolesti, žene u različitim životnim fazama suočavaju se sa različitim fiziološkim stanjima, kao što su menstruacija, trudnoća i menopauza, koja kod nekih žena zahtevaju posebnu pažnju. I prvi (menarha) i poslednji (menopauza) menstrualni ciklus donose značajne promene u hormonskoj ravnoteži i mogu dovesti do različitih fizičkih i emocionalnih simptoma. Trudnoća, kao i porođaj, mogu biti izazovno iskustvo za žene. Danas su očekivanja za zdravim detetom veoma visoka, ali svaka trudnoća može imati potencijalne komplikacije (gestacijska hipertenzija i dijabetes, prevremeni porođaj) koje sve mogu uticati na zdravlje i majke i deteta.

Konačno, treba uzeti u obzir i ograničen pristup zdravstvenoj zaštiti, finansijske barijere za novije i naprednije tretmane, razlike u dijagnozi i lečenju u nekim regionima, kao i uticaj društvenih normi na izbore žena u vezi sa njihovim reproduktivnim zdravljem.

Zaključak: Rešavanje gore pomenutih izazova u vezi sa reproduktivnim zdravljem žena zahteva višestran pristup, uključujući poboljšano obrazovanje i svest. Pristup adekvatnoj opštoj ginekološkoj kao i prenatalnoj i postporođajnoj zdravstvenoj zaštiti je ključan za postizanje optimalnog reproduktivnog zdravlja naših žena.

Ključne reči: reproduktivno zdravlje žena; benigna i maligna ginekološka oboljenja; fiziološka ginekološka stanja; trudnoća; socio-ekonomska pitanja

ABSTRACT

Introduction: Female reproductive health encompasses the well-being of the reproductive system throughout a woman's life, including physical, mental and social aspects. Even in the 21st century numerous women worldwide do not have adequate gynecological and obstetrical healthcare. Disparities for women compared to men exist for sexually transmitted infections, gender-based violence and unintended pregnancy.

Review: Current challenges in female reproductive health care include numerous benign gynecological conditions such as endometriosis, myomas, ovarian dysfunctions and other hormonal disorders including polycystic ovary syndrome and infections including sexually transmitted infections. These conditions are frequent and can cause discomfort, pain, menstrual irregularities and lead to infertility and other health problems. Infertility affects a significant percentage of women and can have a profound impact on their emotional and physical well-being. Still, all of these benign conditions can be underdiagnosed, leading to delayed treatment and increased suffering for women. Another group of gynecological illnesses that can not only impact well-being but increase the mortality of females are gynecological malignancies (ovarian, endometrial, cervical, vulvar and vaginal cancers).

In addition to the illnesses, women in different life stages are faced with different physiological conditions, such as menstruation, pregnancy and menopause, which in some women require specialized attention. Both the first (menarche) and the last (menopause) menstrual cycle bring significant changes in hormonal balance and can lead to various physical and emotional symptoms. Pregnancy as well as a delivery can be a challenging experience for women. Nowadays expectations for a healthy child are very high, but every pregnancy can have potential complications (gestational hypertension and diabetes, premature birth) which can all affect the health of both mother and the child.

Finally, limited access to care, financial barriers for more novel and advanced treatments, disparities in diagnosis and treatment in some regions as well as the impact of societal norms on women's choices regarding her reproductive health should also be taken into consideration.

Conclusion: Addressing above mentioned female reproductive health challenges requires a multifaceted approach, including improved education and awareness. Access to adequate general gynecological as well as prenatal and postpartum health care is crucial for achieving optimal reproductive health of our women.

Key words: female reproductive health; benignant and malignant gynecological illnesses; physiological gynecological conditions; pregnancy; socio-economic issues

HEMSEKS I ŽIVOT SA HIVOM

CHEMSEX AND LIVING WITH HIV

Bratislav Prokić¹, Tatjana Gazibara², Zoran Milosavljević³

1 Nacionalni centar za seksualno i reproduktivno zdravlje - Potent, Beograd, Srbija

2 Institut za epidemiologiju, Medicinski fakultet Univerziteta u Beogradu, Srbija

3 Institut za javno zdravlje Srbije "Dr Milan Jovanović Vatut", Beograd, Srbija

SAŽETAK

Različite psihoaktivne supstance mogu se koristiti u seksualizovanim okruženjima sa ciljem pojačanja seksualnog iskustva, seksualne aktivnosti, euforije, seksualne želje i zadovoljstva. Ovo se obično naziva seksualizovana upotreba droga. Međutim, tokom protekle decenije upotreba sintetičkih droga, kao što su kristalizovani metamfetamin, gama-hidroksibutirat (GHB), gama-butirolakton (GBL) ili mefedron, postala je poznata kao specifična seksualna praksa pod nazivom „hemseks“, podgrupa seksualizovane upotrebe droga. Ove sintetičke droge se mogu pušiti, ušmrkati, progutati ili ubrizgati u okruženju koje podrazumeva seks žurke. Zbog toga su ih nazivali i „drogama za žurke“. A seks žurke na kojima se koriste ove supstance ponekad traju i nekoliko dana, jer povećavaju libido, olakšavaju opuštanje mišića što omogućava dužu seksualnu aktivnost.

Imajući u vidu ove podatke, očekivano postoje javnozdravstvene implikacije hemseksa prvenstveno zbog toga što se kondom slabo koristi na seks žurkama, pa je rizik od zaražavanja polno prenosivim infekcijama (PPI) uključujući HIV visok. Takođe, postoji visok rizik od interakcija između lekova kada se koristi više hemseks droga i drugih lekova ili alkohola. Još jedna implikacija hemseksa je rizik od predoziranja. Predoziranje može imati fatalan ishod i više prikaza slučajeva u literaturi su dobro dokumentovali ove ishode. Štaviše, pojedinci koji praktikuju hemseks su u riziku da budu seksualno zlostavljani, da pretrpe seksualno nasilje i eksploataciju, zbog narušene kognicije i rasuđivanja, kao i nemogućnosti da adekvatno reaguju i odbrane se.

Većina studija u literaturi istražuje hemseks među seksualnim manjinama, kao što su gejevi i biseksualci. Procenjena globalna prevalencija hemseksa među muškarcima koji imaju seks sa muškarcima (MSM) je 16%. Ali, takođe je poznato da se ljudi koji žive sa HIV-om upuštaju u hemseks. Meta-analiza praktikovanja hemseksa među MSM populacijom sugerise da oni MSM koji praktikuju hemseks imaju veću prevalenciju HIV-a i drugih PPI u poređenju sa onima koji ne praktikuju hemseks. Podaci takođe sugerisu da oko jedna trećina MSM populacije koji žive sa HIV-om praktikuje hemseks. Treba napomenuti da se i u Srbiji se organizuju hemseks žurke. Istraživanje sprovedeno među 326 osoba koje žive sa HIV-om širom Srbije pokazalo je da je prevalencija hemseksa 18,7%, što je u skladu sa svetskim podacima. Iako uglavnom muškarci koji žive sa HIV-om praktikuju hemseks, postoji i mala proporcija žena koje žive sa HIV-om koje navode iskustvo sa hemseksom. Podaci iz literature sugerisu da je upotreba drugih nedozvoljenih supstanci kao što su kokain i alkil nitrit, tečna supstanca koja se udiše i koja se obično naziva „poppers“, takođe povezana sa hemseksom. Droge za žurke mogu imati interakciju sa nekim antiretrovirusnim lekovima starije generacije i umanjiti njihovu efektivnost. Na sličan način, osobe koje žive sa HIV-om koje praktikuju hemseks mogu preskakati upotrebu antiretrovirusne terapije tokom seks žurki. Ovo predavanje se fokusira na razumevanje fenomena hemseksa i njegov uticaj među osobama koje žive sa HIV-om.

Ključne reči: hemseks, osobe koje žive sa HIV-om, droge za žurke, HIV.

ABSTRACT

Different psychoactive substances can be used in sexualized settings with the goal to enhance sexual experience, sexual activity, euphoria, desire and pleasure. This is commonly referred to as sexualized drug use. However, over the past decade the use of synthetic drugs, such as crystallised methamphetamine, gamma-hydroxybutyrate (GHB), gamma-butyrolactone (GBL) or mephedrone, has become known as a specific sexual practice entitled "chemsex", a subgroup of sexualized drug use. These synthetic drugs can be smoked, snorted, ingested or injected in a typical setting which involves sex parties. That is why they have also been called "party drugs". And sex parties in which these drugs are being used can last for several days as they increase libido, facilitate muscle relaxation which enable longer sexual activity.

Bearing these pieces of information in mind, there are, expectedly, public health implications of chemsex, primarily because condoms are rarely used at sex parties, so the risk of catching sexually transmitted infections (STIs) including HIV is high. Also, there is a high risk of drug-to-drug interactions when using multiple chemsex drugs and other medications or alcohol. Another implication of chemsex is the risk of overdose. Overdose can be fatal and multiple case reports in literature have well documented these outcomes. Furthermore, when practicing chemsex, individuals are open to sexual abuse, sexual violence and exploitation, because of impaired cognition and reasoning, and reduced ability to adequately respond or protect themselves.

Most studies in literature have explored chemsex practice among sexual minorities, such as gays and bisexuals. An estimated global prevalence of chemsex among men who have sex with men (MSM) is 16%. But, it is also known that people who live with HIV (PLWHIV) engage in chemsex. A meta-analysis of chemsex practice among MSM suggested that those MSM who engage in chemsex have a higher prevalence of HIV and other STIs compared to those who do not. Evidence also suggests that around one third of MSM who live with HIV practice chemsex. Parties that include chemsex are organized in Serbia as well. A study conducted among 326 PLWHIV across Serbia found that the prevalence of chemsex practice is 18.7%, which is in line with the worldwide data. Although mostly men who live with HIV engage in chemsex, there are a few women who live with HIV who report chemsex experience. Literature data suggest that the use of other illicit substances such as cocaine and alkyl nitrite, a liquid substance that is inhaled and commonly called "poppers", are also coupled with chemsex. Party drugs can interact with some older generation antiretroviral drugs and decrease their effectiveness. In a similar manner, PLWHIV who practice chemsex may skip using antiretroviral therapy during sex parties. This presentation focuses on understanding chemsex and its impact among people living with HIV.

Key words: chemsex, people living with HIV, party drugs, HIV.

EPIDEMIOLOŠKE KARAKTERISTIKE HEMORAGIJSKE GROZNICE SA BUBREŽNIM SINDROMOM U CRNOJ GORI OD 2014-2023.

EPIDEMIOLOGY OF HEMORRHAGIC FEVER WITH RENAL SYNDROME IN MONTENEGRO FROM 2014 TO 2023.

Božidarka Rakočević¹, Sanja Medenica¹, Bojan Adžić², Željka Zeković¹

¹ Institut za javno zdravlje Crne Gore, Podgorica, Crna Gora

² Specijalistička veterinarska laboratorija Crne Gore, Podgorica, Crna Gora

SAŽETAK

UVOD: Hemoragijska groznica s bubrežnim sindromom (HGBS) je bolest koju prenose glodari, izazvana hantavirusima iz porodice Bunyaviridae. Karakteriše je povišena temperatura, krvarenje, oštećenje bubrega i hipotenzija. Ova bolest je prirodno žarišna zoonoza i javlja se u mnogim zemljama sveta. Bolest se javlja sporadično ili u epidemijama.

CILJ: Identifikacija najvažnijih epidemioloških karakteristika hemoragijske groznice s bubrežnim sindromom u Crnoj Gori u periodu od 2014. do 2023. godine.

MATERIJAL I METODE: U deskriptivnoj epidemiološkoj studiji sprovedeno je istraživanje na teritoriji Crne Gore za period od deset godina. Korišćene su prijave zaraznih bolesti i godišnji izveštaji o kretanju zaraznih bolesti na teritoriji Crne Gore Centra za kontrolu i prevenciju zaraznih bolesti Instituta za javno zdravlje Crne Gore.

REZULTATI: U periodu od 2014. do 2023. registrovan je 91 pacijent sa hemoragijskom groznicom s bubrežnim sindromom. U posmatranom periodu umrle su 3 osobe (sa letalitetom od 3,3%). Stopa mortaliteta kretala se od 0,1% do 0,3/100.000 stanovnika. Incidencija u posmatranom periodu kretala se od 0,2/100.000 stanovnika u 2020. godini do 6,9/100.000 stanovnika u 2014. godini. Oboljenje je 2,8 puta češće registrovano kod muškaraca nego kod žena. U severnom regionu zemlje registrovano je 67 slučajeva (73,6%). U periodu od juna do septembra registrovano je 55% obolelih. Najveće učešće među potvrđenim slučajevima HGBS bilo je u uzrastu 30-59 godina (50%).

ZAKLJUČAK: Bolest je od velikog javno-zdravstvenog značaja i neophodno je kontinuirano raditi na edukaciji i podizanju svesti o ovoj bolesti, ranoj dijagnostici, kao i praćenju incidencije i distribucije bolesti.

Ključne reči: HGBS, prirodno žarišna zoonoza, epidemija.

ABSTRACT

INTRODUCTION: Hemorrhagic fever with renal syndrome (HBRS) is a rodent-borne disease caused by hantaviruses of the Bunyaviridae family and is characterized by fever, bleeding, kidney damage, and hypotension. This disease is a naturally occurring zoonosis and occurs in many countries around the world. The disease occurs sporadically or in epidemics.

OBJECTIVE: Identification of the most important epidemiological characteristics of hemorrhagic fever with renal syndrome in Montenegro from 2014 to 2023.

MATERIALS AND METHODS: A descriptive epidemiological study was conducted on the territory of Montenegro for a period of ten years. Notifications of infectious diseases and annual reports on the movement of infectious diseases in the territory of Montenegro from the Center for Control and Prevention of Infectious Diseases of the Institute of Public Health of Montenegro were used.

RESULTS: In the period from 2014-2023. 91 patients with hemorrhagic fever with renal syndrome were registered. In the observed period, 3 people died (with a lethality of 3.3%). With a mortality rate ranging from 0.1% to 0.3/100,000 inhabitants. The incidence in the observed period ranged from 0.2/100,000 inhabitants in 2020 to 6.9/100,000 inhabitants in 2014. The disease was registered 2.8 times more often in men than in women. In the northern region of the country, 67 cases (73.6%) were registered. In the period from June to September, 55% of patients were registered. The highest proportion of confirmed cases of HGBS was in the age group of 30-59 years (50%).

CONCLUSION: The disease is of great public health importance and it is necessary to continuously work on education and raising awareness about this disease, early diagnosis, as well as monitoring the incidence and distribution of the disease.

Key words: HGBS, natural focal zoonosis, epidemic

REGISTROVANE VEKTORSKE ZARAZNE BOLESTI U CRNOJ GORI 2014-2023. -ISKUSTVA PRISTUPU JEDNOM ZDRAVLJU

REGISTERED VECTOR-BORNE DISEASES IN MONTENEGRO 2014-2023. -EXPERIENCES OF THE ONE HEALTH APPROACH

Sanja Medenica¹, Božidarka Rakočević¹, Bojan Adžić², Milko Joksimović¹

1 Institut za javno zdravlje Crne Gore, Podgorica, Crna Gora

2 Specijalistička veterinarska laboratorija Crne Gore, Podgorica, Crna Gora

SAŽETAK

UVOD: Vektorske zarazne bolesti su bolesti ljudi uzrokovane parazitima, virusima i bakterijama koje se prenose vektorima. Poznato je više od 100 vrsta ovih mikroorganizama koji se mogu prenijeti vektorima i izazivati bolest kod ljudi. Pristup Jedno Zdravlje promoviše unapređenje zdravlja i dobrobiti ljudi, životinja, biljaka i zajedničke im prirodne okoline.

CILJ: Prikaz epidemioloških karakteristika vektorskih zaraznih bolesti u Crnoj Gori od 2014-2023. godine kao i prikaz zajedničkih aktivnosti humanog i veterinarskog sektora u pristupu jednom zdravlju.

MATERIJAL I METODE: U radu je korišten kvalitativni i kvantitativni opservacioni metod istraživanja.

REZULTATI: U periodu 2014-2023. godine registrovane su četiri vektorske bolesti:

Malarija, Lajmska bolest, Lajšmanioza i Denga. Ukupan broj registrovanih slučajeva je 121 (prosječna stopa incidencije 1,9/100 000 stanovnika). Broj oboljelih se kretao od najmanje 6 slučajeva, stopa incidencije 1,0/100 000 (u 2021. godini) do najviše 19 slučajeva, stopa incidencije 3,1/ 100 000 (u 2016.god.). U posmatranom periodu Lajmska bolest je najučestalija bolest iz ove grupe zaraznih bolesti sa ukupno oko 55 % svih slučajeva (67 slučajeva - prosječna stopa incidencije 1,1/100 000). Lajšmanioza je druga po učestalosti, sa 38% svih registrovanih slučajeva (45 slučajeva - prosječna stopa incidencije 0,72/100 000). Registrovani slučajevi malarije i denge predstavljaju importovane slučajeve.

ZAKLJUČAK: Crna Gora je među državama sa niskim stopama incidencije od vektorskih zaraznih bolesti. Povezujući ljude, životinje i životnu sredinu, One Health može pomoći u rješavanju cijelog spektra kontrole bolesti - od prevencije do otkrivanja, pripravnosti, odgovora i upravljanja - i doprinijeti globalnoj zdravstvenoj sigurnosti.

Ključne riječi: Epidemiološki nadzor, vektorske zarazne bolesti, ONE HEALTH

ABSTRACT

INTRODUCTION: Vector-borne diseases are human diseases caused by parasites, viruses and bacteria transmitted by vectors. More than 100 species of these microorganisms are known to be transmitted by vectors and cause disease in humans. The ONE HEALTH approach promotes the improvement of the health and well-being of people, animals, plants and their shared natural environment.

OBJECTIVE: To present the epidemiological characteristics of vector-borne diseases in Montenegro from 2014-2023, as well as to present the joint activities of the human and veterinary sectors in the ONE HEALTH approach.

MATERIAL AND METHODS: Qualitative and quantitative observational research methods were used in the work.

RESULTS: In the period 2014-2023. four vector-borne diseases were registered: Malaria, Lyme disease, Leishmaniasis and Dengue. The total number of registered cases is 121 (average incidence rate 1.9/100,000 population). The number of patients ranged from a minimum of 6 cases, an incidence rate of 1.0/100,000 (in 2021) to a maximum of 19 cases, an incidence rate of 3.1/100,000 (in 2016). In the observed period, Lyme disease is the most common disease from this group of infectious diseases with a total of about 55% of all cases (67 cases - average incidence rate 1.1/100,000). Leishmaniasis is the second most common, with 38% of all registered cases (45 cases - average incidence rate 0.72/100,000). Registered cases of malaria and dengue represent imported cases.

CONCLUSION: Montenegro is among the countries with low incidence rates of vector-borne diseases. By connecting people, animals and the environment, ONE HEALTH can help address the full spectrum of disease control - from prevention to detection, preparedness, response and management - and contribute to global health security.

Keywords: Epidemiological surveillance, vector-borne diseases, ONE HEALTH

PREVALENCA HEPATITIS B I C VIRUSA U POPULACIJI DOBROVOLJNIH DAVAOKA KRVI

PREVALENCE OF HEPATITIS B AND C AMONG THE POPULATION OF VOLUNTARY BLOOD DONORS

Andrijana Karanović¹

1 Institut za Mikrobiologiju i Imunologiju, Medicinski fakultet Univerziteta u Prištini sa privremenim sedištem u Kosovskoj Mitrovici

SAŽETAK

Uvod: Hronični virusni hepatitis je globalni problem humane medicine i oko 345 miliona ljudi širom sveta živi sa infekcijom hepatitisa.[1]

Cilj rada: Cilj ovog istraživanja bio je da se odredi seroprevalenca HBV i HCV infekcija u srpskim enklavama i severnom delu Kosova i Metohije i uporedi broj pozitivnih u drugoj dekadi XXI veka i 10 godina kasnije kao i da se utvrdi kakav je trend učestalosti od infekcije hepatitisom.

Materijal i metode: Retrospektivnom metodom obuhvaćeni su ispitanici koji su se javili Zavodu za transfuziju krvi u Kosovskoj Mitrovici za serološko testiranje koje je sprovedeno ELISA testom. Obrađeni su podaci u periodu od 2010. g. do 2022. g. Ispitanici su bili podeljeni u grupu dobrovoljnih davaoca krvi i grupu koja je došla na testiranje po uputu lekara.

Rezultati rada: U periodu od 2010.-2012. g testirano je 6326 ispitanika od kojih je 137 (2,17%) bilo pozitivno na hepatitis. Od 2020.g do 2022. g testirano je 5533 ispitanika a pozitivno na hepatitis bilo je 54 (0,61%). U upoređivanim periodima nije bilo značajne razlike u odnosu na pol i infekciju HBV i HCV. Postoji razlika u odnosu na udruženost pozitivnih nalaza HBV i HCV koja je bila značajno veća u periodu od 2010-2012.godine ($p>0,033$). Među dobrovoljnim davaocima krvi bilo je više osoba muškog pola (63,6%) dok su osobe ženskog pola značajno češće testirane po uputu lekara ($p=0,045$). Linearni trend učestalosti HBV i HCV ima statistički negativan trend sa smanjenjem broja obolelih za 3 slučaja za svaku sledeću godinu ($p=0,002$)

Zaključak: Broj pozitivnih od HBV i HCV virusnog hepatitisa u periodu od 2010.g do 2022.g pokazuje tendenciju opadanja što znači da su vakcinacija i mere prevencije dali dobre rezultate.[2,3]

Ključne reči: Hepatitis B; Hepatitis C; Dobrovoljni davaoci krvi

ABSTRACT

Introduction: Chronic viral hepatitis is global problem of medicine and around 345 million of people live with this infection.

The Aim: The goal of this research was to determine the seroprevalence of HBV and HCV infections in Serbian enclaves and the northern part of Kosovo and Metohija in second decade of 21th century and past 10 years, and to determine the trend in frequency of hepatitis infection.

Materials and Methods: The retrospective study included respondents who reported for serological examination with ELISA test to the Institute for Blood Transfusion in Kosovska Mitrovica. Processing data was in period from 2010 to 2022. All respondents were divided into two groups. The first group consisted of respondents who applied for a test with a reference, and the other group of subjects who were voluntary blood donors.

Results: In period from 2010-2012 6326 respondents were tested, of which 137 (2.17%) were positive. In period from 2020-2022 5533 respondents were tested, of which 54 (0.61 %) were positive. In the compared periods, there was no significant difference in relation to gender and infection of HBV and HCV. There is a difference in relation to the association of positive findings of HBV and HCV, which was significantly higher in the period from 2010-2012 ($p>0.033$). Among the voluntary blood donors, there were more male persons (63.6%), while female persons were significantly more often tested on the instructions of a doctor ($p=0.045$). The linear trend of the frequency of HBV and HCV has a statistically significant negative trend with a decrease in the number of patients by 3 cases for each subsequent year ($p=0.002$).

Conclusion: The number of positive HBV and HCV viral hepatitis in the period from 2010 to 2022 shows a decreasing tendency, which means that vaccination and prevention measures have given good results.

Keywords: Hepatitis B; Hepatitis C; Voluntary blood donors

PROCENA ZDRAVLJA I ZDRAVSTVENIH POTREBA ODRASLE POPULACIJE NA KOSOVU I METOHIJI

ASSESSMENT OF HEALTH NEEDS OF THE ADULT POPULATION IN KOSOVO AND METOHIJA

Milošević Jovana¹, Mirković Momčilo¹ Slađana Đurić¹

¹ Medicinski fakultet u Prištini-Kosovska Mitrovica, Katedra za preventivnu medicinu, Kosovska Mitrovica, Srbija

SAŽETAK

Uvod: Procena zdravstvenog stanja stanovništva sa identifikacijom zdravstvenih potreba je prvi korak u ostvarivanju centralnog cilja svih razvojnih strategija - zaštite i unapređenja zdravlja.

Cilj rada: Glavni cilj ovog ispitivanja zdravlja bio je da se, na osnovu podataka dobijenih upitnikom, proceni zdravstveno stanje i zdravstvene potrebe odraslog stanovništva u srpskim sredinama na Kosovu i Metohiji.

Metode rada: Za prikupljanje podataka korišćen je upitnik za odrasle osobe, dizajniran u skladu sa preporukama EUROSTAT-a za sprovođenje istraživanja zdravlja stanovništva, prema Metodološkom uputstvu Evropskog istraživanja zdravlja, drugi talas.

Rezultati: Anketirano je 1067 osoba (51,5% žena). Dve trećine ispitanika (71,2%) smatralo je da je dobrog zdravlja (dobro i veoma dobro), 23,6% osrednjeg zdravlja, dok 5,2% ispitanika svoje zdravlje je ocenilo kao loše i veoma loše. Pozitivniju sliku o zdravlju imali su muškarci u odnosu na žene, mlađe osobe, sa višim i visokim obrazovanjem. Svoje zdravlje kao loše ili veoma loše statistički značajno češće su ocenjivali stanovnici južno od reke Ibar (12,7%) u odnosu na stanovnike severno od te reke (9,1%). Kao prediktori samoprocene zdravlja izdvojili su se starija životna dob, prisustvo telesnog bola, postojanje neke od hroničnih nezaznih bolesti, viši skor depresije, propisani lekovi u predhodne dve nedelje, povremeno ili nerazmišljanje o zdravlju pri izboru hrane, nedostatak bliskih osoba kao oslonca. Postojanje nekog zdravstvenog problema ili dugotrajne bolesti potvrdio je svaki četvrti ispitanik (24,3%), a ograničenost u obavljanju svakodnevnih životnih aktivnosti zbog zdravstvenih problema prijavio je skoro svaki treći ispitanik (29,3%). Na osnovu sopstvenog iskaza, 26,3% je prijavilo neku hroničnu bolest, 23% dve ili više. Najčešća bolest bila je hipertenzija (24,6%), koju su češće prijavljivali stanovnici opštine Zubin Potok, između 45 i 64 godine, osnovnog ili nižeg obrazovanja, udovci/ce, nesposobni za rad i domaćice. Izabranog lekara opšte medicine ili pedijatra u državnoj zdravstvenoj ustanovi imalo je dve trećine ispitanika (75,2%), a u privatnoj praksi svaki dvanaesti ispitanik. U godini koja je prethodila istraživanju, svaki deseti ispitanik (10,6%) je bolnički lečen. Zbog zdravstvenih razloga sa posla je odsustvovalo 15,4% ispitanika, češće osobe sa višim i visokim obrazovanjem i osobe starosne kategorije od 56 do 65 godina. Više od polovine ispitanika (60,2% muškaraca i 55,6% žena) je zadovoljno zdravstvenom zaštitom, češće osobe sa višim ili visokim obrazovanjem i stanovnici opštine Štrpce.

Zaključak: Dobijeni rezultati uglavnom se poklapaju sa podacima iz literature, posebno regiona. Značaj ovog istraživanja ogleda se u dobijanju podataka koji su nedostajali i mogu pomoći kreatorima zdravstvene politike prilikom donošenja odluka u pravcu očuvanja i unapređenja zdravlja stanovništva kao i stvaranja što efikasnije zdravstvene službe.

Ključne reči: zdravstveno stanje, zdravstvene potrebe, odraslo stanovništvo, Kosovo i Metohija

ABSTRACT

Introduction: Assessment of the health status of the population by identifying health needs is a step in achieving one of the goals of all development strategies - protection and improvement of health.

Aim: The main goal of this health research was to assess the health status and health needs of the adult population in the Serb communities in Kosovo and Metohija on the basis of the data obtained by the questionnaire.

Method: For data collection, a questionnaire for adults was used, designed in accordance with the recommendations of EUROSTAT for conducting health surveys of the population, according to the Methodological Guidelines of the European Health Research, the second wave.

Results: A total of 1.067 respondents (51.5% women) were interviewed. Two thirds of the respondents (71.2%) declared that they are in good health (good and very good), 23.6% respondents declared that their health were moderate, while 5.2% of the respondents rated their health as bad and very bad. Men had a more positive picture of health compared to women, younger people, with high and higher education. Residents who live south of the Ibar River (12.7%) rated their health as poor or very poor statistically significantly more often than residents north of that river (9.1%). Age, presence of physical pain, existence of some chronic non-communicable diseases, higher grade of depression, prescribed medications in the previous two weeks, occasional or not thinking about health when choosing food, lack of social support were pointed out as predictors of self-assessment of health. The existence of a health problem or long-term illness was confirmed by every fourth respondent (24.3%), and a restriction in performing daily life activities due to health problems was reported by almost every third respondent (29.3%). Based on their own testimony, 26.3% reported a chronic illness, 23% two or more. The most common disease was hypertension (24.6%), which was more frequently reported by residents of Zubin Potok, aged between 45 and 64, primary or lower education, widows, incapable of work and housewives. Two thirds of the respondents (75.2%) had a chosen general practitioner or pediatrician in a state health institution, and in private practice every twelfth respondent. In the year preceding the survey, every tenth respondent was hospitalized (10.6%). Due to health reasons, 15.4% of respondents were absent from work, more often persons with high and higher education and persons aged 56 to 65. More than half of the respondents (60.2% of men and 55.6% of women) are satisfied with the health care, more often people with higher or higher education and residents of the municipality of Štrpce.

Conclusion: The obtained results generally coincide with the data from the literature, especially from the region. The importance of this research is reflected in obtaining the missing data and can help health policy makers in creating decisions in the direction of preserving and improving the health of the population as well as creating the more effective healthcare service.

Key words: health status, health needs, adults, Kosovo and Metohija

PROCENA RIZIKA RADNIH MESTA U ZDRAVSTVENIM USTANOVAMA: TEORIJSKI OKVIR I METODOLOŠKI PRISTUPI

RISK ASSESSMENT OF JOB POSITIONS IN HEALTHCARE INSTITUTIONS: THEORETICAL FRAMEWORK AND METHODOLOGICAL APPROACHES

Milivoje Galjak¹

¹ Medicinski fakultet u Kosovskoj Mitrovici, Kosovska Mitrovica, Republika Srbija

SAŽETAK

Procena rizika u zdravstvenim ustanovama predstavlja temeljni element sistema bezbednosti i zdravlja na radu, imajući u vidu kompleksnost i raznovrsnost profesionalnih opasnosti kojima su zaposleni izloženi. Ovaj rad analizira teorijski i normativni okvir procene rizika, tipologiju rizika specifičnih za zdravstveni sektor, kao i metodološki pristup njihovom identifikovanju, kvantifikaciji i upravljanju. Zaposleni u zdravstvu, uključujući lekare, medicinske tehničare, pomoćno i administrativno osoblje, izloženi su različitim vrstama rizika: biološkim, hemijskim, fizičkim, psihosocijalnim i ergonomskim. Biološki rizici se posebno izdvajaju zbog neposrednog kontakta sa potencijalno infektivnim materijalima i pacijentima, dok hemijski i fizički rizici proizilaze iz upotrebe lekova, dezinficijensa i radnih uslova u savremenim kliničkim okruženjima. Psihosocijalni i ergonomske faktori dodatno doprinose profesionalnom opterećenju.

Metodologija procene rizika uključuje korake poput identifikacije opasnosti, procene izloženosti i verovatnoće, određivanja posledica, kvantifikacije rizika kroz matrice rizika, i definisanja mera kontrole. U skladu sa Zakonom o bezbednosti i zdravlju na radu Republike Srbije i međunarodnim standardom ISO 45001:2018, procena rizika se formalizuje Aktom o proceni rizika koji mora da sadrži analizu svakog radnog mesta i konkretne predloge mera zaštite. Posebna pažnja se posvećuje radnim mestima sa povećanim rizikom, gde je neophodno sprovesti dodatne medicinske provere i obezbediti posebne uslove rada.

Preventivne i korektivne mere uključuju tehnička rešenja (npr. ventilacija, izolacija), organizacione mere (radne procedure, smenski rasporedi), korišćenje lične zaštitne opreme (LZO), edukaciju zaposlenih i psihološku podršku. Efikasno upravljanje rizicima zahteva ne samo primenu tehničkih i organizacionih rešenja, već i kontinuiranu evaluaciju, nadzor i edukaciju svih zaposlenih.

Diskusija ukazuje na neujednačenu primenu zakonskih regulativa i potrebu za sistemskim unapređenjem inspekcijiskog nadzora, posebno u domenu edukacije nižeg medicinskog osoblja i dosledne upotrebe zaštitne opreme. Zaključno, procena rizika mora biti kontinuiran i prilagodljiv proces koji se oslanja na multidisciplinarni pristup, proaktivan menadžment i kulturu bezbednosti, sa ciljem očuvanja zdravlja zaposlenih i osiguranja kvaliteta zdravstvenih usluga.

Ključne reči: procena rizika, zdravstvene ustanove, bezbednost i zdravlje na radu, biološki rizici, zaštitne mere.

ABSTRACT

Risk assessment in healthcare institutions represents a fundamental element of occupational health and safety systems, given the complexity and diversity of professional hazards to which employees are exposed. This paper analyzes the theoretical and regulatory framework for risk assessment, the typology of risks specific to the healthcare sector, and the methodological approach to their identification, quantification, and management. Healthcare workers—including physicians, nurses, auxiliary, and administrative staff—are exposed to various categories of risks: biological, chemical, physical, psychosocial, and ergonomic. Biological risks are particularly critical due to direct contact with potentially infectious materials and patients, while chemical and physical risks arise from the use of drugs, disinfectants, and working conditions in modern clinical environments. Psychosocial and ergonomic factors further contribute to occupational stress.

The risk assessment methodology includes several key steps: hazard identification, exposure and likelihood assessment, determination of consequences, risk quantification using risk matrices, and the definition of control measures. In accordance with the Occupational Health and Safety Law of the Republic of Serbia and the international ISO 45001:2018 standard, risk assessment is formalized in the Risk Assessment Act, which must include an analysis of each workplace and concrete proposals for safety measures. Special attention is devoted to high-risk workplaces, where additional medical screenings and specific working conditions must be ensured.

Preventive and corrective measures include technical solutions (e.g., ventilation systems, hazard zone isolation), organizational measures (work procedures, shift schedules), personal protective equipment (PPE), employee training, and psychological support. Effective risk management requires not only technical and organizational solutions but also continuous evaluation, supervision, and education of all employees.

The discussion highlights inconsistencies in the implementation of legal regulations and the need for systemic improvements in occupational health oversight—especially in the areas of education for lower-level healthcare staff and consistent use of protective equipment. In conclusion, risk assessment must be treated as a continuous and adaptable process that relies on a multidisciplinary approach, proactive management, and a culture of safety, with the aim of preserving employee health and ensuring the quality of healthcare services.

Keywords: risk assessment, healthcare institutions, occupational health and safety, biological risks, protective measures.

METABOLIČKI SINDROM I ISHRANA U STUDENTSKOJ POPULACIJI

CURRENT CHALLENGES IN MAINTAINING THE REPRODUCTIVE HEALTH OF WOMEN

Danijela Ilić¹, Biljana Zogović², Marija Milić¹

1 Medicinski fakultet u Prištini - Kosovska Mitrovica, Katedra za preventivnu medicinu

2 Medicinski fakultet u Prištini - Kosovska Mitrovica, Katedra za patološku fiziologiju

SAŽETAK

Uvod: Metabolički sindrom (MetS) je naziv za grupu faktora rizika (povišen krvni pritisak, visok nivo šećera u krvi, abdominalna gojaznost i visok nivo triglicerida u krvi) koji zajedno povećavaju rizik za razvoj aterosklerotičnih kardiovaskularnih bolesti, insulinske rezistencije, dijabetesa i vaskularnih neuroloških komplikacija kao što je moždani udar. Prevalencija metaboličkog sindroma među studentskom populacijom varira u zavisnosti od regiona i životnih navika.

Cilj rada: Utvrditi prevalenciju metaboličkog sindroma i navike u ishrani studenata Univerziteta u Pristini.

Metod rada: Ova studija preseka je sprovedena u Zavodu za zdravstvenu zaštitu studenata u Kosovskoj Mitrovici (Studentska Poliklinika). Sistematskim pregledom je obuhvaćeno 600 studenata kojima je procenjen nutritivni status, izmeren krvni pritisak i odrađene odgovarajuće laboratorijske analize (nivo glukoze, triglicerida i lipoproteina visoke i niske gustine). U određivanju nutritivnog statusa korišćeni su: BMI (body mass index - indeks telesne mase), procenat ukupne masne mase tela i obim struka. Istovremeno su studenti popunjavali socio-demografski upitnik kao i upitnik za ispitivanje životnih navika studenata. Kriterijum za dijagnozu metaboličkog sindroma je prisustvo tri od ukupno pet faktora rizika prema NCEP - National Cholesterol Education Program, Adult Treatment Panel III. Nivo statističke značajnosti je postavljen na $p < 0,05$.

Rezultati rada: Ukupno 600 studenata je bilo uključeno u studiju. Nešto veći je udeo studentkinja u uzorku istraživanja 66%. Većina studenata 48,0% živelo je u studentskom domu. Prosečan BMI je bio $22,2 \pm 3,9$. Studenata sa viškom kilograma, koji prema BMI spadaju u grupu predgojaznih bilo je 93 (15,5%) a gojaznih 27 (4,5%). Prevalencija MetSa sa prisustvom sva tri faktora rizika iznosila je 2,5%, stim da je učestalost značajno veća kod studenata 73,3% u odnosu na studentkinje 26,7%. Najzastupljeniji faktor rizika za definisanje metaboličkog sindroma bio je povišen nivo triglicerida (86,7%). Povećan obim struka (80,0%) je drugi najčešći faktor rizika a zatim nizak nivo lipoproteina visoke gustine HDL (53,3%). Zanimljivo je da je 13,3% studenata imalo MetS a prema BMI pripadali su kategoriji normalno uhranjenih, dok je većina studenata sa znacima metaboličkog sindroma pripadala kategoriji gojaznih 73,3%. Povećan rizik za nastanak MetSa imalo je 26,2% studenata jer su imali jedan ili dva faktora rizika neophodna za postavljanje dijagnoze. Manje od polovine studenata redovno doručkuje 250 (41,7%) a pet obroka dnevno ima svega 22 (3,7%). Voće svakodnevno konzumira 31,5%, povrće 22,4%, dok koštunjavo voće samo 4,2% studenata. Polovina studenata 52,2% konzumira brzu hranu 5 do 6 puta u toku nedelje, kao i čips i slane grickalice, dok jedna trećina jede slatkiše svaki dan 36,3%. Mleko i mlečni proizvodi su najčešće na jelovniku dva do 4 puta u toku nedelje kod većine studenata 28,5%.

Zaključak: Prevalencija Metsa u studentskoj populaciji znatno se ne razlikuje od prevalencije MetSa u svetu. S obzirom da postoji tendencija porasta ovog oboljenja trebalo bi pažnju usmeriti na usvajanje zdravih stilova života, što podrazumeva, redovnu fizičku aktivnost, raznovrsnu ishranu sa dosta voća i povrća, održavanje telesna mase u okviru normalno uhranjene prema BMI klasifikaciji, prestanak pušenja i konzumacije alkohola.

Ključne reči: Metabolički sindrom, ishrana, studenti

ABSTRACT

Introduction: Metabolic syndrome (MetS) is the name for a group of risk factors (high blood pressure, high blood sugar, abdominal obesity, and high blood triglycerides) that together increase the risk of developing atherosclerotic cardiovascular disease, insulin resistance, diabetes, and vascular neurological complications such as stroke. The prevalence of metabolic syndrome among the student population varies by region and lifestyle.

Objective: To determine the prevalence of metabolic syndrome and eating habits of students at the University of Pristina.

Methodology: This cross-sectional study was conducted at the Institute for Student Health Care in Kosovska Mitrovica (Student Polyclinic). The systematic review included 600 students whose nutritional status was assessed, blood pressure was measured and appropriate laboratory analyzes were performed (glucose, triglycerides and high and low density lipoprotein levels). In determining the nutritional status, the following were used: BMI (body mass index), percentage of total body fat mass and waist circumference. At the same time, the students filled out a socio-demographic questionnaire as well as a questionnaire for examining students' lifestyle habits. The criterion for the diagnosis of metabolic syndrome is the presence of three out of a total of five risk factors according to NCEP - National Cholesterol Education Program, Adult Treatment Panel III. The level of statistical significance was set at $p < 0,05$.

Results: A total of 600 students were included in the study. The share of female students in the research sample is slightly higher, 66%. The majority of students, 48.0%, lived in a student dormitory. The average BMI was 22.2 ± 3.9 . There were 93 overweight students (15.5%) and 27 overweight students (4.5%) according to BMI. The prevalence of MetS with the presence of all three risk factors was 2.5%, with the frequency being significantly higher in male students 73.3% compared to female students 26.7%. The most prevalent risk factor for defining the metabolic syndrome was an elevated triglyceride level (86.7%). Increased waist circumference (80.0%) is the second most common risk factor, followed by a low level of high-density lipoprotein HDL (53.3%). It is interesting that 13.3% of students had MetS and according to BMI they belonged to the category of normal nutrition, while the majority of students with signs of metabolic syndrome belonged to the category of obese 73.3%. 26.2% of students had an increased risk of developing MetSa because they had one or two risk factors necessary for diagnosis. Less than half of the students eat breakfast regularly 250 (41.7%) and only 22 (3.7%) have five meals a day. Fruit is consumed daily by 31.5%, vegetables by 22.4%, while only 4.2% of students consume stone fruits. Half of students 52.2% consume fast food 5 to 6 times a week, as well as chips and salty snacks, while one third eat sweets every day 36.3%. Milk and milk products are most often on the menu two to four times a week for the majority of students, 28.5%.

Conclusion: The prevalence of MetS in the student population does not differ significantly from the prevalence of MetS in the world. Considering that there is a tendency for this disease to increase, attention should be focused on the adoption of healthy lifestyles, which means regular physical activity, a varied diet with plenty of fruits and vegetables, maintaining a body weight within the range of a normal diet according to the BMI classification, stopping smoking and alcohol consumption.

Key words: Metabolic syndrome, nutrition, students

DISTRIBUCIJA VEKTORA U SVETLU GLOBALNIH KLIMATSKIH PROMENA

VECTOR DISTRIBUTION IN LIGHT OF GLOBAL CLIMATE CHANGE

Malinić Jovan, Poluga Jasmina, Katanić Nataša

1 Univerzitetski Klinički centar Srbije

2 Medicinski fakultet Univerziteta u Prištini sa sedištem u Kosovskoj Mitrovici

SAŽETAK

Tokom prošlog veka je došlo do globalnog menjanja klime zbog emisije gasova koji stvaraju efekat staklene bašte, a promene će se nastaviti i dalje. Klimatske promene i njihovi negativni uticaji na globalnom nivou se smatraju jednom od najvećih pretnji ljudskom zdravlju u 21. veku. Klima direktno utiče na zdravlje ljudi kroz sve veće klimatske ekstreme, pogoršanje kvaliteta vazduha, porast nivoa mora što na više načina ima uticaj na sisteme proizvodnje hrane i vodene resurse. Spekter bolesti i zdravstvenih stanja na koje utiče klima u najširem smislu je veliki, od bolesti uzrokovanih toplotom i zračenjem, nedovoljne ishrane, respiratornih i srčanih problema, utapanja, povreda i mentalnog stresa koji nastaje usled ekstremnih i iznenadnih vremenskih prilika. Klima utiče i na zarazne bolesti, naročito one koje se prenose vodom, vazduhom ili vektorima. Globalno zagrevanje je direktno uticalo na geografsku distribuciju krpelja, naročito vrste *Ixodes ricinus*, prenosioca više bolesti od kojih su najznačajnije Lajmska bolest i krpeljski encefalitis. Uočena je pojava krpelja na sve većim nadmorskim visinama i većim geografskim širinama u odnosu na ranije. Predpostavlja se da su klimatske promene bile značajan činioc za širenje i drugih vektora u Evropi npr *Aedes albopictus* (azijski tigrasti komarac), prenosilac zike, dengue i čikungunje ili peščana mušica *Phlebotomus*, prenosilac lajšmanijoze. Veoma visoke temperature vazduha u leto 2010. godine povezane su sa epidemijom groznice Zapadnog Nila koja je izbila u jugoistočnoj Evropi, a i epidemije koje su se javile u narednim godinama povezane su sa temperaturnim anomalijama u toku letnjih meseci.

Na disperziji patogena i vektora značajan uticaj imaju i globalizacija i međunarodni vazdušni saobraćaj.

ZAKLJUČAK Praćenje meteoroloških uslova kao i dugoročna prognoza na osnovu dobijenih podataka može u nekoj meri pomoći u otkrivanju potencijalnih epidemijskih prekursora za bolesti koje se prenose vektorima, tj mogu poslužiti kao sistemi ranog upozorenja o pojavi bolesti u cilju smanjenja rizika od razbuktavanja epidemija.

KLJUČNE REČI Klimatske promene, zdravlje, epidemija, vektorske bolesti, krpelji, komarci

ABSTRACT

During the last century, there has been a global climate change due to the emission of greenhouse gases, and these changes will continue. Climate change and its negative impacts on a global scale are considered one of the greatest threats to human health in the 21st century. Climate directly affects human health through increasing climate extremes, worsening air quality, and rising sea levels, which influence food production systems and water resources in various ways. The spectrum of diseases and health conditions influenced by climate, in the broadest sense, is extensive, ranging from heat and radiation-related illnesses, malnutrition, respiratory and cardiovascular problems, drowning, injuries, and mental stress resulting from extreme and sudden weather events. Climate also affects infectious diseases, particularly those transmitted through water, air, or vectors. Global warming has directly impacted the geographical distribution of ticks, particularly the species *Ixodes ricinus*, which transmits multiple diseases, the most significant of which are Lyme disease and tick-borne encephalitis. The presence of ticks has been observed at increasingly higher altitudes and latitudes compared to previous times. It is presumed that climate change has been a significant factor in the spread of other vectors in Europe, such as *Aedes albopictus* (Asian tiger mosquito), a vector for Zika, dengue, and chikungunya, or the sand fly *Phlebotomus*, a vector for leishmaniasis. Extremely high air temperatures in the summer of 2010 were associated with an outbreak of West Nile fever in Southeast Europe, and epidemics that occurred in subsequent years have been linked to temperature anomalies during the summer months. Globalization and international air traffic also significantly influence the dispersion of pathogens and vectors.

Conclusion

Monitoring meteorological conditions as well as long-term forecasts based on obtained data can help, to some extent, in identifying potential epidemic precursors for vector-borne diseases, serving as early warning systems for the emergence of diseases to reduce the risk of epidemic outbreaks.

Keywords : Climate change, health, epidemic, vector-borne diseases, ticks.

REZULTATI SEROEPIDEMIOLOŠKOG ISTRAŽIVANJA KRPELJSKOG ENCEFALITISA U HUMANOJ POPULACIJI AP VOJVODINE

RESULTS OF SEROEPIDEMIOLOGICAL STUDY ON TICK-BORNE ENCEPHALITIS IN THE HUMAN POPULATION OF THE AP VOJVODINA

Tatjana Pustahija, Vladimir Petrović, Snežana Medić

1 Medicinski fakultet Univerziteta u Novom Sadu

2 Institut za javno zdravlje Vojvodine,

SAŽETAK

Uvod: Krpeljski encefalitis (KE) je prirodnožarišna vektorska bolest virusne etiologije. Kao posledica globalnog zagrevanja i klimatskih promena koje dovode do povećanja brojnosti vektora i rezervoara ove bolesti, KE postaje sve veći javnozdravstveni izazov. Širenje postojećih endemskih žarišta i formiranja novih ima za posledicu porast učestalosti ove bolesti u humanoj populaciji i pojave autohtonih slučajeva u državama u kojima do sada nisu registrovani.

Cilj rada: Utvrditi seroprevalenciju specifičnih antitela protiv virusa KE stanovnika AP Vojvodine.

Metode rada: Seroepidemiološko istraživanje sprovedeno je prospektivno. Prikupljen je uzorak od 2000 rezidualnih seruma, koji je prethodno stratifikovan u odnosu na uzrast prema Popisu stanovnika Republike Srbije. Jedan uzorak su činili rezidualni serumi 1000 stanovnika 49 naseljenih mesta Fruške gore, a drugi rezidualni serumi 1000 stanovnika AP Vojvodine van fruškogorske regije. Laboratorijsko ispitivanje uzoraka seruma obe grupe ispitanika na prisustvo specifičnih IgG antitela sprovedeno je inicijalno ELISA testom, a zatim su svi pozitivni i granični uzorci dalje ispitani na prisustvo neutrališućih antitela. Izračunata je seroprevalencija specifičnih antitela na virus KE u obe grupe ispitanika, te je izvršeno poređenje između njih, a analizirane su i seroprevalencije u odnosu na pol, uzrast, mesto stanovanja ispitanika, zanimanje i prethodni ubod krpelja.

Rezultati: Seroprevalencija među stanovništvom Fruške gore iznosila je 0,40% (95%CI: 0,01-1,02) i bila je dvostruko viša od vrednosti seroprevalencije registrovane u grupi stanovnika AP Vojvodine van ove regije (0,20%; 95%CI: 0,02-0,72). Najviša seroprevalencija prema uzrastu od 2,94% (CI:95%: 0,07-16,39) registrovana je u uzrasnoj grupi 80 i više godina u oba uzorka ispitanika. Seroprevalencije prema polu su bile u odnosu 1:1 (0,20%:0,20%) u grupi stanovnika AP Vojvodine van Fruške gore, dok su svi seropozitivni ispitanici na virus KE u grupi stanovnika Fruške gore bili muškog pola, a registrovana seroprevalencija iznosila je 0,80% (95%CI: 0,20-2,05). Seropozitivni ispitanici registrovani su u naseljenim mestima: Beočin (1,08%; 95%CI: 0,02-5,99), Beška (1,45%; 95%CI: 0,03-8,07), Čortanovci (3,57%; 95%CI: 0,09-19,90), Irig (1,92%; 95%CI: 0,04-10,71) na teritoriji Fruške gore, a van ove regije samo u Novom Sadu (0,65%; 95%CI: 0,07-2,33).

Zaključak: Stanovništvo regije Fruške gore i delova Južnobačkog okruga je prokuženije virusom KE, nego ostalo stanovništvo AP Vojvodine van ovih područja, a utvrđena seroprevalencija je u nivou one registrovane u evropskim niskoendemijskim zemljama. S obzirom na rastući trend obolevanja od ove bolesti u Evropi, pored sprovođenja sveobuhvatnog aktivnog nadzora nad hospitalizovanim pacijentima na osnovu standardizovane definicije slučaja, neophodno je i jačanje laboratorijskih kapaciteta, posebno u pravcu izvođenja neutralizacionog testa. Pored toga, potrebno je sprovesti kontinuiran monitoring zaraženosti krpelja virusom KE, kao i serološki skrining sentinel životinja. Preventivne programe treba usmeriti i na podizanje svesti o KE među zdravstvenim radnicima i potencijalno izloženim stanovništvom.

Ključne reči: krpeljski encefalitis; KE; virus krpeljskog encefalitisa; seroepidemiološke studije; test neutralizacije.

ABSTRACT

Introduction: Tick-borne encephalitis (TBE) is a viral vector-borne disease with focal distribution. As a result of global warming and climate change leading to an increase in the number of vectors and reservoirs, TBE is becoming an increasingly important public health challenge. The spread of existing endemic foci and the formation of new ones has resulted in an increase in the incidence of this disease in humans and the occurrence of autochthonous cases in countries where they have not been registered so far.

Objective: To determine the seroprevalence of specific antibodies against TBE virus in the population of the AP Vojvodina.

Methods: The seroepidemiological study was conducted prospectively. A sample of 2000 residual sera was collected, which was previously stratified by age according to the Census of the Republic of Serbia. One sample consisted of residual sera of 1000 inhabitants of 49 settlements of Fruška Gora, and the other of residual sera of 1000 inhabitants of AP Vojvodina outside that region. Serum samples from both groups were initially tested by ELISA for the presence of specific IgG antibodies, and then all positive and equivocal samples were further tested for the presence of neutralizing antibodies. The seroprevalence of specific antibodies to TBE virus was calculated in both groups, with a comparison between them. Also, the seroprevalences were analyzed in relation to gender, age, place of residence, occupation and previous tick bite.

Results: The seroprevalence among the population of Fruška Gora was 0.40% (95%CI: 0.01-1.02) and was twice as high as the seroprevalence in the population of AP Vojvodina outside that region (0.20%; 95%CI: 0.02-0.72). The highest seroprevalence by age of 2.94% (CI95%: 0.07-16.39) was registered in the age group 80 and older in both groups of respondents. Seroprevalences by gender were in the ratio of 1:1 (0.20%:0.20%) in the group of residents of AP Vojvodina outside Fruška Gora, while all seropositive subjects for TBE virus in the group of residents of Fruška Gora were male with registered seroprevalence of 0.80% (95%CI: 0.20-2.05). Seropositive respondents were registered in: Beočin (1.08%; 95%CI: 0.02-5.99), Beška (1.45%; 95%CI: 0.03-8.07), Čortanovci (3.57%; 95%CI: 0.09-19.90), Irig (1.92%; 95%CI: 0.04-10.71) in the territory of Fruška Gora, and outside that region only in Novi Sad (0.65%; 95%CI: 0.07-2.33).

Conclusion: The population of the Fruška Gora region and parts of the South Bačka District is more infected with the TBE virus than the rest of the population of AP Vojvodina outside these areas. Established seroprevalence was at the level of European low-endemic countries. Given the increasing trend of this disease in Europe, it is necessary to strengthen laboratory capacities, especially in the direction of performing a neutralization assay, in addition to implementing comprehensive active surveillance of hospitalized patients based on standardized case definition. Besides, it is necessary to conduct continuous monitoring of the TBE virus prevalence in ticks, as well as serological screening of sentinel animals. Preventive programs should also be aimed at raising awareness about TBE among healthcare workers and the potentially exposed population.

Key words: tick-borne encephalitis; TBE; tick-borne encephalitis virus; seroepidemiological studies; neutralization assay.

SLUČAJ OBOLIJEVANJA OD MORBILA U OPŠTINI BAR 2024.GODINE

A CASE OF MEASLES IN THE MUNICIPALITY OF BAR, 2024

Igor Galić¹, Ljiljana Jovičević¹
¹ Dom zdravlja Bar

SAŽETAK

Uvod: Male boginje (Morbilli) predstavljaju jednu od najkontagioznijih bolesti gdje je stopa sekundarnog javljanja veća od 90% među izloženim i osjetljivijim pojedincima (9-10 osjetljivih osoba oboli kada se nalazi u bliskom kontaktu sa oboljelima). Najčešće se javlja u vidu manjih ili većih epidemija. (1)

Na teritoriji opštine Bar od ukupno registrovanih 3190 djece rođenih od 01.01.2017. do 31.08.2022. godine čija dob je prispjela za vakcinaciju prvom dozom MMR vakcine, vakcinisano je 51,07% djece, odnosno njih 1629, što je niže od republičkog prosjeka koji iznosi 63,96%. Dakle, nevakcinisano prvom dozom MMR vakcine u pretškolskom uzrastu je 1561 dijete, odnosno 48,93%. (2)

Na teritoriji opštine Bar od ukupno registrovanih 639 djece rođenih od 01.01.2017. do 31.12.2017. godine čija dob je prispjela za vakcinaciju drugom dozom MMR vakcine (ovo je prva generacija prispjela za drugu dozu MMR vakcine), vakcinisano je 52,58% djece, odnosno njih 336, što je niže od republičkog prosjeka koji iznosi 62,93%. Dakle, nevakcinisano drugom dozom MMR vakcine u ovom uzrastu je 303 djece, odnosno 47,42%. (2)

Tokom početka epidemije malih boginja 2023/2024, od početka 2024. godine registrovano je ukupno 12 slučajeva morbila, dok je u posljednjih 13 mjeseci zabilježeno ukupno 47 slučajeva (prema izvještaju od 29.04.2024. godine). (3) Preporuke, protokoli i postupci sa kojima je vršena obrada slučajeva su bili već definisani. (4)

Prikaz bolesnika: Djevojčica starosti 8 godina, sa simptomima makulopapulozne ospe po licu i gornjim ekstremitetima sa širenjem u kasnijoj fazi od grudi ka donjem dijelu tijela; na bukalnoj sluzokoži promjene izgleda prosutog pirinča na hiperemičnoj podlozi tzv. „Koplikove mrlje“; prisutno i curenjem nosa, povišena tjelesna temperatura (38,5 °C), i malaksalost.

Djevojčica je od strane pedijatra iz PZU u Baru pregledana 26.04.2024. godine i dobijen je IgM pozitivni nalaz na morbile, nakon čega je dana 27.04.2024. godine Centru za medicinsku mikrobiologiju Instituta za javno zdravlje Crne Gore dostavljen uzorak brisa ždrijela i nosa, a 28.03.20224. godine PCR dijagnostikom potvrđena infekcija virusom morbila.

Epidemiološkim ispitivanjem je utvrđeno da djevojčica nije vakcinisana protiv malih boginja niti jednom dozom MMR vakcine, kao i da je u periodu od 9-10.04.2024. godine sa karate klubom "Bar" boravila na turniru u Sarajevu (BiH) gdje je bila aktuelna epidemija morbila u većem obimu.

Aktivnim istraživanjem identifikovane su ukupno 104 osobe koje su u periodu zaraznosti bile u kontaktu sa djevojčicom (74 kontakta sa putovanja na turnir u karateu u Sarajevu, 26 učenika iz odjeljenja koje pohađa, troje članova porodice djevojčice i učiteljica). Dva suspektna slučaja su nakon dobijanja negativnih rezultata analiza briseva nazofarinksa odbačena.

Nakon dobijanja potvrde o izolaciji uzročnika malih boginja, Odsjek za epidemiologiju Higijensko-epidemiološke službe Doma zdravlja Bar intenzivno preduzima neophodne korake kako bi se spriječilo masovnije širenje bolesti (epidemiološko ispitivanje, pojačan epidemiološki nadzor, aktivno istraživanje slučajeva, prikupljanje kliničkih uzoraka za potvrdno testiranje na morbile, istraživanje i obrada kontakata, imunizaciju osjetljivih kontakata, izolaciju slučajeva).

Rezultat ovih aktivnosti je sprečavanje pojave novog slučaja a samim tim i epidemije u zbog nedovoljnog obima vakcinisanoj populaciji.

Zaključak: Kaskadni sistem mjera (opšte uz djelimično sprovedenu specifičnu mjeru sprječavanja nastanka epidemije) dovele su do rezultata koji se ogledan u uspješno kontrolisanoj epidemiji što govori o značaju i neophodnosti svih primjenjenih mjera.

Ključne riječi: morbillae, MMR, epidemija

ABSTRACT

Introduction: Smallpox (Morbilli) represents one of the most contagious diseases where the rate of secondary occurrence is higher than 90% among exposed and more sensitive individuals (9-10 susceptible people get sick when in close contact with sick people). It most often occurs in the form of smaller or larger epidemics. (1)

In the territory of the municipality of Bar, out of a total of 3190 children born from 01.01.2017. until 31.08.2022. 51.07% of children, i.e. 1629 of them, were vaccinated, which is lower than the national average of 63.96%. Thus, 1,561 children, i.e. 48.93%, were not vaccinated with the first dose of the MMR vaccine in preschool age. (2)

In the territory of the municipality of Bar, out of a total of 639 children born since 01.01.2017. until 31.12.2017. 52.58% of children, i.e. 336 of them, were vaccinated, which is lower than the national average of 62.93%. Therefore, 303 children, i.e. 47.42%, were not vaccinated with the second dose of the MMR vaccine at this age. (2)

During the beginning of the measles epidemic in 2023/2024, from the beginning of 2024, a total of 12 cases of measles were registered, while in the last 13 months, a total of 47 cases were recorded (according to the report of April 29, 2024). (3) The recommendations, protocols and procedures with which the cases were processed were already defined. (4)

Patient presentation: An 8-year-old girl with symptoms of maculopapular smallpox on the face and upper extremities, spreading in a later phase from the chest to the lower part of the body; on the buccal mucosa changes in the appearance of spilled rice on a hyperemic background, the so-called "Koplik's spots"; also present with runny nose, elevated body temperature (38.5 °C), and malaise.

The girl was examined by a pediatrician from the PZU in Bar on April 26, 2024. and an IgM positive result for measles was obtained, after which on 27.04.2024. a throat and nasal swab sample was submitted to the Center for Medical Microbiology of the Institute of Public Health of Montenegro, and on 03/28/2024. infection with the measles virus was confirmed by PCR diagnostics.

Epidemiological examination established that the girl was not vaccinated against measles with a single dose of the MMR vaccine, as well as that in the period from April 9-10, 2024. In 2008, with the "Bar" karate club, she was at a tournament in Sarajevo (BiH), where there was a current measles epidemic on a larger scale.

Active research identified a total of 104 people who were in contact with the girl during the infectious period (74 contacts from the trip to the karate tournament in Sarajevo, 26 students from the class she attends, three family members of the girl and the teacher). Two suspicious cases were rejected after obtaining negative results of nasopharyngeal swab analysis.

After receiving confirmation of the isolation of the causative agent of smallpox, the Department of Epidemiology of the Hygiene and Epidemiological Service of the Bar Health Center intensively takes the necessary steps to prevent the mass spread of the disease (epidemiological investigation, increased epidemiological surveillance, active investigation of cases, collection of clinical samples for confirmatory measles testing, investigation and treatment of contacts, immunization of susceptible contacts, isolation of cases).

The result of these activities is the prevention of the occurrence of a new case and, therefore, an epidemic in the vaccinated population due to the insufficient volume.

Conclusion: The cascading system of measures (in general with a partially implemented specific measure to prevent the outbreak of the epidemic) led to a result that is reflected in a successfully controlled epidemic, which speaks of the importance and necessity of all applied measures.

Key words: measles, MMR, epidemic

KAKO POVEĆATI PROCENAT PRAVOVREMENO VAKCINISANE DECE MMR VAKCINOM U NOVOM PAZARU? RAD NA POLJU PODIZANJA NIVOVA ZDRAVSTVENE PROSVEĆENOSTI STANOVNIŠTVA

HOW TO INCREASE THE PERCENTAGE OF CHILDREN IN NOVI PAZAR WHO RECEIVE THE MMR VACCINE ON TIME? EFFORTS IN RAISING THE LEVEL OF HEALTH EDUCATION AMONG THE POPULATION

Šefadil Spahić¹

1 Zavod za javno zdravlje Novi Pazar

SAŽETAK

Uvod: Procenat nevakcinisane dece postaje globalni javnozdravstveni problem. U 2023.-oj godini u svetu nije pravovremeno vakcinisano 14. miliona dece, a u tom periodu u Novom Pazaru obuhvat MMR vakcinom bio je 57,3%. Pojavom prvih slučajeva oboljenja morbila 07.05.2024. godine, proglašena je epidemija, gde je do maja 2025. godine, registrovano 883. slučaja.

Cilj rada: Prikazati i pokazati kako aktivan rad u zajednici, uz dobru koordinaciju, može dovesti do rešenja problema, tj. podizanja procenta vakcinisane dece. Metod rada: Formalno istraživanje (ankete roditelja i lekara), primena bihevioralnih uvida za razvoj komunikacionih materijala, obuka zdravstvenih radnika za interpersonalnu komunikaciju, edukacija roditelja, sistemske promene u domovima zdravlja, procedura za upis u predškolske ustanove i pravnih procedura.

Rezultati: Multisektorski pristup izražen kroz angažovanje 186 učesnika iz više od 20 institucija. Obuku za interpersonalnu komunikaciju završilo je 64 radnika. Aktivna komunikacija, obavljani su razgovori sa roditeljima (724), koji oklevaju da vakcinišu decu. Šest radionica za 150 roditelja dece u predškolskim ustanovama sa povećanjem od 98% znanja vezano za vakcine. U domovima zdravlja urađeno je 8 organizacionih promena. Medijski događaji, njih 36, podiglo je svest, aktualiziralo problem i suprostavilo se rasprostranjenim dezinformacijama. Jednogodišnji rad povećao je obuhvat MMR vakcinom za 15% tokom šest meseci (septembar 2024 - mart 2025.), uspostavljajući održivu strategiju imunizacije zasnovanu na lokalnom vlasništvu.

Zaključak: U rešavanju javnozdravstvenih kriza u sredinama niskog poverenja i niskog obuhvata vakcinisane dece, potreban je kontinuiran multisektorski tim u cilju rešavanja socijalnih i sistemskih korena oklevanja, da bi se unapredile procedure i, kao takve, zadržale održivim

Ključne reči: MMR vakcina, Novi Pazar, multisektorski pristup

ABSTRACT

Introduction: The percentage of unvaccinated children is becoming a global public health issue. In 2023, 14 million children worldwide were not vaccinated on time, and during that same period, MMR vaccine coverage in Novi Pazar was 57.3%. Following the emergence of the first measles cases on May 7, 2024, an epidemic was declared, with 883 cases registered by May 2025. Community-based efforts involving all stakeholders were initiated to increase the percentage of vaccinated children.

Objective: To present and demonstrate how active community engagement, supported by good coordination, can lead to solving the problem.

Methodology: Formal research (surveys of parents and doctors), application of behavioral insights to develop communication materials, training of healthcare workers in interpersonal communication, parent education, systemic changes in primary healthcare centers, implementation of procedures for preschool enrollment, and legal measures.

Results: A multisectoral approach involving 186 participants from over 20 institutions. A total of 64 healthcare workers completed interpersonal communication training. Active communication efforts included conversations with 724 parents hesitant about vaccinating their children. Six workshops were conducted for 150 parents of preschool children, resulting in a 98% increase in knowledge related to vaccines. Eight organizational changes were implemented in healthcare centers. Thirty-six media events raised awareness, brought attention to the issue, and countered widespread misinformation. One year of work increased MMR vaccine coverage by 15% over six months (September 2024 - March 2025), establishing a sustainable, locally-owned immunization strategy.

Conclusion: In addressing public health crises in environments with low trust and low vaccination coverage, a continuous multisectoral team is needed to tackle the social and systemic roots of vaccine hesitancy. This is essential for improving procedures and ensuring their long-term sustainability.

Key word: MMR vaccine, Novi Pazar, Multisectoral approach

ZNANJE STUDENTKINJA NIŠKOG UNIVERZITETA U VEZI POSTOJANJA POLNOPRENOŠIVIH INFEKCIJA KAO FAKTORA RIZIKA U NASTANKU RAKA GRLIĆA MATERICE

KNOWLEDGE OF SEXUALLY TRANSMITTED INFECTIONS AS A RISK FACTOR FOR CERVICAL CANCER AMONG FIRST-YEAR FEMALE STUDENTS AT THE UNIVERSITY OF NIŠ

Mirko Ilić¹, Biljana Kocić^{1,2}, Nataša Rančić^{1,2}

¹ Institut za javno zdravlje Niš, Srbija,

² Medicinski fakultet Niš, Univerziteta u Nišu, Srbija

SAŽETAK

Uvod: U svetu se svake godine beleži oko 100 miliona slučajeva polnopenosivih infekcija (PPI) kod mladih. PPI su česte u zemljama u razvoju. Nastanak, dugotrajni opstanak i izostanak lečenja PPI predstavlja faktor rizika za nastanak raka grlića.

Cilja rada: Kod studentkinja prve godine niškog univerziteta utvrditi nivo znanja o PPI kao faktoru rizika i načinu zaštite od nastanka PPI u cilju sprečavanja nastanka malignog procesa na grliću materice.

Metode rada: U istraživanje su uključene sve studentkinje prve godine niškog univerziteta (2008) a kao metod rada primenjena je studija preseka. Kao instrument istraživanja korišćen je anketni upitnik.

Rezultati: U ispitivanoj populaciji svega 1,6% ispitanica je bolovalo od neke PPI, dok je u 0,6% slučajeva bolovao njihov seksualni partner.

Najveći broj studentkinja (60%) prepoznaje više od polovine simptoma PPI, statistički značajno češće studentkinje koje potiču iz grada ($p=0,017$), nisu menjale prebivalište ($p<0,001$), koje su završile medicinsku školu ($p<0,001$), upisale Medicinski fakultet ($p<0,001$) i imale seksualne odnose ($p<0,001$). Da neke PPI mogu da budu bez simptoma znalo je 47,7% ispitanica i to studentkinje koje su završile medicinsku školu ($p<0,001$), upisale Medicinski fakultet ($p<0,001$), potiču iz grada ($p=0,003$), nisu menjale prebivalište ($p=0,048$), čiji očevi imaju visoko obrazovanje ($p<0,001$) i koje su imale seksualne odnose ($p<0,001$).

Da je postojanje PPI kod žena faktor rizika za nastanak raka grlića materice znalo je 58,5% studentkinja i to pre svega one koje su završile medicinsku školu ($p<0,001$), upisale Medicinski fakultet ($p<0,001$), potiču iz grada ($p=0,024$), i čiji roditelji imaju visoko obrazovanje ($p=0,007$) kod oca i ($p=0,003$) kod majke.

Da je postojanje PPI kod seksualnog partnera faktor rizika za nastanak navedenog malignog oboljenja znalo njih 58,6% i to pre svega studentkinje koje su završile medicinsku školu ($p<0,001$), upisale Medicinski fakultet ($p<0,001$), potiču iz grada ($p=0,005$) i čiji roditelji imaju visoko obrazovanje ($p=0,048$) kod oca i ($p<0,001$) kod majke.

Kao najsigurniji način zaštite od PPI studentkinje navode upotrebu kondoma.

Zaključak: Kontinuiranim zdravstveno vaspitnim radom sa mladima i upoznavanjem sa elementarnim činjenicama o PPI može se uticati na odgovarajuće ponašanje i merama koje imaju za cilj sprečavanje nastanka PPI a samim tim i do pojave maligne alteracija grlića materice. Edukaciju pre svega sprovoditi kod mladih koji još nisu stupili u seksualne odnose.

Ključne reči: polnopenosive infekcije, znanje, rak grlića materice, faktor rizika

Zahvalnica: Rad je podržan sredstvima iz projekta Ministarstva prosvete, nauke i inovacija Republike Srbije (ugovor broj 451-03-137/2025-03/200113).

ABSTRACT

Introduction. Approximately 100 million cases of sexually transmitted infections (STIs) among young people are reported worldwide each year. STIs are particularly prevalent in developing countries. The occurrence, persistence, and lack of treatment of STIs represent significant risk factors for the development of cervical cancer.

Aim. To assess the level of knowledge regarding STIs as a risk factor, as well as the awareness of STI prevention methods, among first-year female students at the University of Niš, with the aim of cervical cancer prevention.

Methods. The study included all first-year female students enrolled at the University of Niš in 2008. A cross-sectional study design was employed, and data were collected using a structured questionnaire.

Results. Only 1.6% of respondents reported having had an STI, while 0.6% stated that their sexual partner had experienced an STI. A majority of the students (60%) were able to identify more than half of the STI symptoms. This level of knowledge was significantly more common among students from urban areas ($p=0.017$), those who had not changed their place of residence ($p<0.001$), those who had completed medical secondary school ($p<0.001$), those who enrolled in the Faculty of Medicine ($p<0.001$), and those with sexual experience ($p<0.001$). Awareness that some STIs can be asymptomatic was demonstrated by 47.7% of respondents, particularly among those with a medical education background ($p<0.001$), enrolled in the Faculty of Medicine ($p<0.001$), from urban areas ($p=0.003$), who had not relocated ($p=0.048$), whose fathers had higher education ($p<0.001$), and who had sexual intercourse ($p<0.001$). A total of 58.5% of participants recognized the presence of an STI in women as a risk factor for cervical cancer, most commonly those with medical education ($p<0.001$), those enrolled in medical studies ($p<0.001$), from urban environments ($p=0.024$), and with parents holding higher education degrees (father: $p=0.007$; mother: $p=0.003$). Similarly, 58.6% were aware that an STI in a sexual partner is a risk factor for cervical cancer. This was more common among students with medical education ($p<0.001$), enrolled in the Faculty of Medicine ($p<0.001$), from urban areas ($p=0.005$), and whose parents had higher education (father: $p=0.048$; mother: $p<0.001$). The most frequently cited method of STI prevention was condom use.

Conclusion. Continuous health education targeting young people, particularly those who have not yet become sexually active, and increasing awareness of basic STI-related facts can significantly influence responsible sexual behavior and implementation of preventive measures aimed at reducing the incidence of STIs and consequently, cervical malignancies.

Keywords: sexually transmitted infections, knowledge, cervical cancer, risk factor

Acknowledgement

The work was supported by funds from the project of the Ministry of Education, Science and Innovation of the Republic of Serbia (Contract No.451-03-137/2025-03/200113).

ZASTUPLJENOST MALIGNIH BOLESTI KOD STANOVNIKA U SRPSKIM SREDINAMA NA KOSOVU I METOHIJI

PREVALENCE OF MALIGNANT DISEASES AMONG RESIDENTS OF SERBIAN COMMUNITIES IN KOSOVO AND METOHIJA

Sladana Đurić, Sara Miletić

1 Medicinski fakultet u Prištini sa privremenim sedištem u Kosovskoj Mitrovici

SAŽETAK

Uvod: Obzirom na specifičnosti u pogledu etiologije, rasprostranjenosti kao i mera koje se sprovode u cilju njihovog sprečavanja i lečenja, maligne bolesti predstavljaju jedan od najtežih socijalnomedicinskih problema zajednice i zdravstvene službe. Njihov tretman kao i posledice lečenja, često dovode do pogoršanja kvaliteta života, promena u emotivnom i socijalnom funkcionisanju obolelih, uzrokujući izmene u svakodnevnoj porodičnoj rutini i promene u svim aspektima porodičnog života.

Cilj rada: Osnovni cilj rada je da se sagleda socijalno-medicinski značaj, analizira struktura obolevanja i umiranja od malignih bolesti u srpskim sredinama Kosova i Metohije.

Materijal i metode: Sprovedena je retrospektivna analiza oboljevanja i umiranja od malignih tumora u srpskim sredinama Kosova i Metohije u 2023. godini. Kao izvor podataka korišćena je medicinska dokumentacija Epidemiološke službe nadležnog Zavoda za javno zdravlje u Kosovskoj Mitrovici.

Rezultati: Među obolelima od malignih bolesti koji su, tokom 2023. godine, otkriveni u srpskim sredinama Kosova i Metohije u većem procentu bili su zastupljeni pacijenti muškog pola. Najveći deo novoobolelih živio je na teritoriji opštine severna Kosovska Mitrovica i u trenutku postavljanja dijagnoze imao je od 51 do 60 godina. U periodu istraživanja od posledica malignih bolesti u srpskim sredinama Kosova i Metohije umrlo je 22 ljudi. Od ukupnog broja umrlih, najveći deo činili su muškarci i oboleli koji su živeli u enklavama na području centralnog Kosova i Metohije.

Zaključak: Rezultati istraživanja ukazuju da postoji naglašena potreba za sprovođenjem preventivnih mera i aktivnosti kao i potreba za mobilizacijom svih struktura u zajednici a u cilju promocije zdravlja i prevencije nastanka malignih bolesti. Primena promotivno-edukativne aktivnosti usmerene ka informisanju stanovništva o prepoznavanju ranih simptoma i znakova malignih bolesti predstavlja osnovu strategije u kontroli ovih oboljenja.

Ključne reči: Maligne bolesti, socijalno-medicinski značaj, novooboleli, umrli.

ABSTRACT

Introduction: Given the specifics in terms of etiology, prevalence and measures that are implemented in order to prevent and treat them, malignant diseases represent one of the greatest problems for community and health service. Their treatment, as well as the consequences of treatment, often lead to deterioration in the quality of life, changes in the emotional and social functioning of the patients, causing changes in the daily family routine and changes in all aspects of family life.

Aim of the study: The primary aim of the study is to examine the socio-medical significance, analyze the structure of illness and death caused by malignant diseases in the Serbian communities in Kosovo and Metohija.

Material and methods: A retrospective analysis of incidence and mortality from malignant tumors was conducted in Serbian communities in Kosovo and Metohija in the year 2023. Medical documentation from the Epidemiology Service of the responsible Public Health Institute in Kosovska Mitrovica was used as the data source.

Results: Among the ill suffering from malignant diseases, during 2023., which were discovered in the Serbian communities of Kosovo and Metohija the majority were male patients. The majority of newly diagnosed individuals resided in the municipality of North Kosovska Mitrovica and were between the ages of 51 and 60 at the time of diagnosis. In the study period, 22 people died as a result of malignant diseases. Among the total number of deaths, males and patients living in enclaves in the central Kosovo and Metohija region constituted the majority.

Conclusion: The results of the research indicate that there is an emphasized need for the implementation of preventive measures and activities, as well as the need for the mobilization of all structures in the community in order to promote health and prevent the occurrence of malignant diseases. The application of promotional and educational activities aimed at informing the population about the recognition of early symptoms and signs of malignant diseases is the basis of the strategy in the control of these diseases.

Keywords: Malignant diseases, socio-medical significance, newly diagnosed, deceased.

UTICAJ PANDEMIJE COVID-19 NA POTROŠNJU ANTIDIJABETIKA U SRBIJI: JOINPOINT ANALIZA TREND

THE IMPACT OF COVID-19 PANDEMIC ON THE CONSUMPTION OF ANTIDIABETIC DRUGS IN SERBIA: A JOINPOINT TREND ANALYSIS

Jelena Filimonović, Marija Milić, Zorica Stanojević Ristić

1 Medicinski fakultet u Prištini sa privremenim sedištem u Kosovskoj Mitrovici

2 Zavod za javno zdravlje Kosovska Mitrovica

SAŽETAK

Uvod: Osobe sa dijabetesom češće su imale teže kliničke oblike COVID-19. Međutim, postoji hipoteza da određeni antidijabetički lekovi mogu biti povezani sa boljim ishodima kod pacijenata sa COVID-19. Cilj ove studije bio je da se analizira da li je pandemija COVID-19 uticala na promenu potrošnje antidijabetika u Srbiji.

Metode: Ova deskriptivna analiza je sprovedena korišćenjem javno dostupnih podataka dobijenih sa zvaničnog sajta Agencije za lekove i medicinska sredstva Srbije u periodu 2006-2022. Regresiona analiza jointpoint je primenjena za ispitivanje dinamike korišćenja antidijabetičkih lekova tokom ispitivanog perioda.

Rezultati: U Republici Srbiji je ova studija analizirala upotrebu 28 antidijabetičkih lekova u periodu od 2006. do 2022. godine. Rezultati su pokazali da je na početku pandemije COVID-19 došlo do povećanja potrošnje dulaglutida (počev od 2020. godine) i smanjenje potrošnje insulina detemir (počev od 2019), insulina lispro (kombinovanog) i insulina lispro (brzodelujućeg) (počev od 2020.).

Zaključak: Naša studija je otkrila značajne promene u upotrebi određenih antidijabetičkih lekova, kao što su povećana potrošnja dulaglutida i smanjena upotreba različitih tipova insulina. Ove promene odražavaju strategije koje se razvijaju u lečenju dijabetesa za bolju podršku pacijentima tokom ove globalne zdravstvene krize.

Ključne reči: antidijabetički lekovi, uticaj Covid-19, potrošnja, Srbija

ABSTRACT

Background: People with diabetes more often experienced severe clinical forms of COVID-19. However, it has been hypothesized that certain antidiabetic drugs may be associated with better outcomes in COVID-19 patients. The aim of this study was to analyze whether the COVID-19 pandemic influenced the change in consumption of antidiabetic drugs in Serbia.

Methods: This descriptive analysis was carried out using publicly accessible data obtained from the official website of the Medicines and Medical Devices Agency of Serbia during the period 2006-2022. The joinpoint regression analysis was applied to investigate the dynamics of antidiabetic drugs utilization over time.

Results: In the Republic of Serbia, this study analyzed the use of 28 antidiabetic drugs between 2006 and 2022. The results showed that at the beginning of the COVID-19 pandemic, there was an increase in consumption of dulaglutide (starting from 2020) and a decrease in consumption of insulin detemir (starting from 2019), insulin lispro (combined) and insulin lispro (fast-acting) (starting from 2020).

Conclusion: Our study revealed significant changes in the usage of certain antidiabetic drugs, such as increased consumption of dulaglutide and decreased use of various insulin types. These changes reflect the evolving strategies in diabetes treatment to better support patients during this global health crisis.

Keywords: antidiabetic drugs, impact of Covid-19, consumption, Serbia

POTREBA I ZNAČAJ MOLITVE I LJUBAVI ZA PSIHOFIZIČKI BALANS DETEKTOVANO KVANTNOM DIJAGNOSTIKOM

THE NEED AND IMPORTANCE OF PRAYER AND LOVE FOR PSYCHOPHYSICAL BALANCE DETECTED BY QUANTUM DIAGNOSTICS

Milica Burazor

Ordinacija kvantne medicine " Bilje i Melemi"

SAŽETAK

Savremena medicina sve više daje važnost psiholoških, emotivnih i duhovnih faktora u očuvanju psihofizičkog zdravlja. Čovek, organ, ćelija je svetlosna energija čestica biofotona koja ima svoju vibraciju - frekvencu koja se može izmeriti različitim uređajima. Jedna od njih je metoda kvantne medicine, koja koristi različite instrumente koje preko glavnih 12 i sporednih meridijana i akupunkturalnih tačaka registruju protok energije i očitavaju stanje ćelija, organa i organizma. Detektuju se energetska stanja organizma (aura i čakre); fiziološki i biohemijski parametri, markeri, hormoni, vitamin , minerali, tako i patologija i patogeni (paraziti, virusi, gljivice, bakterije, protozoe). Suština lečenja kvantnom medicinom krije se u sledećem: ako je materija neuništiva, neuništiva je i informacija koju ona sadrži. Pri nastanku bolesti, postoji informacija o bolesti, ali je njoj prethodila informacija o zdravom stanju, te se korigovanjem poremećene frekvencije elektromagnetnog polja organizam može vratiti u elektromagnetnu ravnotežu, ili joj se bar približiti. Kvantna medicina spaja najsavremenija dostignuća biofizike i kvantne fizike sa poznavanjem energetskih polja u organizmu. Svaka misao, svaka emocija i raspoloženje utiču na biofizičku stabilnost ćelije. Molitva (religijska, personalna, meditacija, tetahealing) povećavaju vibraciju ćelije, aktivira se parasimpatikus, smanjuje se kortisol, upalni procesi. Pozitivne misli i emocije koje imaju veliku vibraciju kao što su molitva, безусловna ljubav, radost, saosećanje, empatija, opraštanje i pokajanje su dubinski čistači ćelija. Raspon vrednosti ovih emocija je od 500 Hz do 1000 Hz, za razliku od nižih emocija: tuga, ljutnja, briga, strah, koje vibriraju nisko (0,4 Hz - 20Hz), te uvode organizam u disbalans. Svesnost čistih misli i emocija visokih vibracija su ogledalo našeg zdravlja. Reče Otac Tadej: " Kakve su nam misli, takav nam je život".

ABSTRACT

Modern medicine increasingly emphasizes the importance of psychological, emotional and spiritual factors in preserving psychophysical health. Man, organ, cell is the light energy of bio photon particles that has its own vibration - a frequency that can be measured by different devices. One of them is the method of quantum medicine, which uses various instruments that register the flow of energy and read the state of cells, organs and organisms through the 12 main and minor meridians and acupuncture points. The energy state of the organism is detected (aura and chakras); physiological and biochemical parameters, markers, hormones, vitamins, minerals, as well as pathology and pathogens (parasites, viruses, fungi, bacteria, protozoa). The essence of treatment with quantum medicine lies in the following: if matter is indestructible, so is the information it contains. At the onset of a disease, there is information about the disease, but it was preceded by information about a healthy state, and by correcting the disturbed frequency of the electromagnetic field, the organism can return to electromagnetic balance, or at least get close to it. Quantum medicine combines the most modern achievements of biophysics and quantum physics with the knowledge of energy fields in the organism. Every thought, every emotion and mood affects the biophysical stability of the cell. Prayer (religious, personal, meditation, tetahealing) increases cell vibration, activates the parasympathetic, decreases cortisol, inflammatory processes. Positive thoughts and emotions that have a high vibration such as prayer, unconditional love, joy, compassion, empathy, forgiveness and repentance are deep cell cleaners. The value range of these emotions is from 500 Hz to 1000 Hz, in contrast to lower emotions: sadness, anger, worry, fear, which vibrate low (0.4 Hz - 20 Hz), and introduce the organism into imbalance. Awareness of pure thoughts and emotions of high vibrations are the mirror of our health. Father Tadej said: "As our thoughts are, so is our life".

JAVNOZDRAVSTVENI ZNAČAJ POVREDA KOD DECE PUTNIKA U VOZILU

PUBLIC HEALTH IMPORTANCE OF INJURIES IN CHILDREN AS VEHICLE PASSENGERS

Mirjana Štrbac¹

1 Institut za javno zdravlje Vojvodine

SAŽETAK

Povrede koje deca zadobijaju kao putnici u vozilima predstavljaju značajan javnozdravstveni problem zbog njihove učestalosti, težine posledica i mogućnosti prevencije. Povreda se definiše kao telesno oštećenje nastalo usled akutnog izlaganja energiji koja prevazilazi fiziološke granice tolerancije organizma. Iako se često nazivaju „nesrećama“, povrede nisu nasumični događaji; one se dešavaju u predvidivim okolnostima sa prepoznatljivim faktorima rizika. Među nenamernim povredama, saobraćajne povrede predstavljaju jedan od vodećih uzroka smrti i invaliditeta dece širom sveta. Prema podacima Svetske zdravstvene organizacije, više od 1,3 miliona ljudi godišnje izgubi život u saobraćajnim nesrećama, pri čemu su deca uzrasta od 2 do 14 godina posebno ugrožena. U Srbiji, gotovo polovina svih smrtnih slučajeva u saobraćaju u kojima su deca učestvovala, dogodila se dok su bila putnici u vozilu. Većina ovih povreda mogla je biti sprečena ili značajno ublažena da su bile primenjene odgovarajuće mere bezbednosti—kao što su sigurnosni pojasevi ili dečija sedišta—u skladu sa uzrastom i fizičkim razvojem deteta. Pravilna upotreba dečijih auto-sedišta može smanjiti rizik od smrtonosne povrede i do 60%. Zdravstveni radnici imaju ključnu ulogu u edukaciji roditelja o ispravnoj upotrebi sistema za vezivanje i u razbijanju uobičajenih zabluda. Njihov autoritet i čest kontakt sa starateljima čine ih ključnim akterima u promociji bezbednosti dece u saobraćaju. Haddonova matrica predstavlja konceptualni okvir za analizu faktora rizika i identifikaciju mogućnosti za intervenciju kroz faze pre događaja, tokom događaja i nakon događaja. Efektivna prevencija zahteva saradnju više sektora, ciljanu javnu edukaciju, unapređeno sprovođenje zakona i pristup zasnovan na podacima iz javnog zdravlja. Na kraju, smanjenje broja povreda među decom putnicima predstavlja zajedničku društvenu odgovornost koja zavisi od proaktivne edukacije, sprovođenja politika i strateškog uključivanja zdravstvenog sistema.

Ključne reči: povrede dece, saobraćajne nezgode, javno zdravlje, bezbednost vozila, dečija autosedišta, prevencija povreda, zdravstveno vaspitanje

ABSTRACT

Injuries sustained by children as vehicle passengers represent a significant public health concern due to their frequency, severity of outcomes, and preventability. An injury is defined as bodily harm resulting from an acute exposure to energy that exceeds the body's physiological tolerance. Although commonly referred to as “accidents,” injuries are not random events; they occur under predictable circumstances with identifiable risk factors. Among unintentional injuries, traffic-related trauma is one of the leading causes of death and disability in children worldwide. According to the World Health Organization, over 1.3 million people die annually in road traffic collisions, with children aged 2-14 years being particularly vulnerable. In Serbia, nearly half of all traffic-related fatalities involving children occur while they are passengers in vehicles. The majority of these injuries could have been prevented or significantly reduced in severity had appropriate safety measures—such as seat belts or child restraints—been used according to the child's age and physical development. Proper use of child car seats has been shown to reduce the risk of fatal injury by up to 60%. Healthcare professionals play a critical role in educating parents about the correct use of restraint systems and addressing common misconceptions. Their credibility and frequent contact with caregivers position them as key agents of change in promoting traffic safety for children. Haddon's Matrix provides a conceptual framework for analyzing risk factors and identifying intervention points across pre-event, event, and post-event phases. Effective prevention requires multisectoral collaboration, targeted public education, improved legislation enforcement, and a data-driven public health approach. Ultimately, reducing injuries among child passengers is a shared societal responsibility that hinges on proactive education, policy implementation, and the strategic involvement of health systems.

Keywords: child injuries, traffic accidents, public health, vehicle safety, child car seats, injury prevention, health education

PRIMENA KONCEPTA MKPB MODULA ZA SPROVOĐENJE TRANSDISCIPLINARNOG NAUČNOG PRISTUPA U POSLEDIPLOMSKOM MEDICINSKOM OBRAZOVANJU

APPLICATION OF THE MKPB MODULE CONCEPT FOR IMPLEMENTING A TRANSDISCIPLINARY SCIENTIFIC APPROACH IN POSTGRADUATE MEDICAL EDUCATION

Aleksandar Ćorac¹, Zoran Bukumirić²

1 Katedra za Preventivnu medicinu, Univerzitet u Prištini sa privremenim sedištem u Kosovskoj Mitrovici, Medicinski fakultet, Kosovska Mitrovica, Republika Srbija

2 Institut za medicinsku statistiku i infomatiku, Medicinski fakultet, Univerzitet u Beogradu, Srbija

SAŽETAK

Postojeći model obrazovanja kadrova u oblasti uticaja životne sredine na zdravlje čoveka, karakteriše izrazita stručna i sektorska fragmentacija. Umesto da integriše sve pozitivne aspekte multidisciplinarnosti, interdisciplinarnosti i transdisciplinarnosti, trenutni model često favorizuje uskostručne pristupe. Ova fragmentacija je prisutna između različitih naučnih i stručnih oblasti - biologije, hemije, poljoprivrede, medicine, inženjerskih nauka, ali i ekonomije, prava i društvenih nauka. U takvom okviru, stručnjaci iz različitih disciplina često pristupaju problemima isključivo iz perspektive svojih struka, boreći se za „svoj deo kolača“, što rezultira uskim i jednostranim tumačenjima problema. Ovaj pristup neretko stvara nove izvore sukoba među stručnjacima, jer se različite struke međusobno ne prepoznaju kao komplementarne, već kao konkurentne, što dodatno otežava efikasno rešavanje složenih problema. Takva fragmentacija je posebno problematična kada je reč o pitanjima životne sredine, jer ona zahteva celovit pristup. Zdravstveni problemi izazvani faktorima iz životne sredine, kao što su zagađenje, klimatske promene, izloženost štetnim materijama ili nanočesticama, uticaj socijalnog okruženja itd. ne mogu se adekvatno razumeti i rešavati ako se razmatraju parcijalno, iz ugla samo jedne naučne discipline. Životna sredina je sveobuhvatan sistem, i sveobuhvatni problemi koji iz nje proističu moraju biti tretirani integrirano - uzimajući u obzir sve relevantne aspekte koji mogu doprineti rešavanju tih problema. Za realizaciju posle diplomskih studija u ovoj oblasti neophodna je transdisciplinarna saradnja između različitih disciplina, ne samo na nivou razmene informacija, već kroz aktivno povezivanje i preplitanje različitih metodologija i perspektiva kako bi se došlo do inovativnih i održivih rešenja. Obim različitih rizika po životnu sredinu i zdravlje čoveka, koji nastaju u savremenom društvu, svakog dana je sve veći. Tako se danas kao glavni faktori uticaja na zdravlje ljudi pojavljuju neki rizici koji pre samo par godina ili desetinama godina nisu ni postojali. Iz istih razloga pristup temi rizika po životnu sredinu i zdravlje čoveka postao je problematičan i u razvijenim zemljama. U nizu kritičnih situacija nastalih u oblasti zaštite životne sredine i zdravlja čoveka, različite države nisu imale adekvatne odgovore na nastale probleme. Kao na primer u slučajevima sve češćih vanrednih situacija (poplave, akcidenti u industriji i saobraćaju itd.), aerogagađenja, novih rudarskih postrojenja, COVID, neadekvatne bezbednosti hrane, zavisnosti od interneta, društvenih kriza itd. Jedan od glavnih razloga tome bio je upravo nedostatak odgovarajućih stručnjaka koji bi na pravi način mogli da sagledaju ove probleme i ukažu stanovništvu i državnim aparatima kako treba ispravno postupiti. Analizom navedenih problema ustanovili smo da postoji potreba da se kroz obrazovni sistem stvore stručnjaci koji će, usvajanjem transdisciplinarnih znanja, na adekvatan način moći da odgovore svim savremenim izazovima u oblasti zaštite životne sredine i zdravlja stanovništva. Postojeći obrazovni modeli, u okviru posle diplomskih edukacije lekara, nisu u stanju da proizvedu takve stručnjake pa je neophodno sprovesti transformaciju obrazovnog procesa u ovoj oblasti i to direktnom intervencijom u konceptu učenja usvojen primenom MCPB modula, a kroz primenu problem based blended learning blocks modula sa integriranim transdisciplinarnim znanjima (TransBlox), a koji će dopunjavati teorijsku i praktičnu nastavu u okviru Blended learning kurseva na Moodle platformi. U okviru ovih modula, nakon uvodnog teksta u kojem se postavlja problem i istraživački cilj, svaki naredni korak će uključivati vodena pitanja prilagođena rešavanju postavljenog problema. Ova pitanja će biti interaktivno dizajnirana, s mogućnošću biranja ponuđenih odgovora ili unošenja odgovora u predviđena polja. Odgovarajući na vodena pitanja, student će postupno identifikovati ključne komponente koje treba razjasniti i, prateći logičan sled pitanja, učiti kako da sistematski rešava problem. Korišćenje unapređenih modula omogućuje integraciju transdisciplinarnih znanja u nastavne kurikule posle diplomskih studija i maksimalnu objektivnost u praćenju nastave i ocenjivanju, kao i transparentnost i demokratizaciju celokupnog nastavnog procesa.

Ključne reči: Transdisciplinarnost, meta-kognicija, posle diplomsko obrazovanje lekara

ABSTRACT

The existing model of training professionals in the field of environmental impacts on human health is characterized by pronounced professional and sectoral fragmentation. Instead of integrating the positive aspects of multidisciplinary, interdisciplinarity, and transdisciplinarity, the current model often favors narrow professional approaches. This fragmentation occurs across various scientific and professional domains - biology, chemistry, agriculture, medicine, engineering, as well as economics, law, and the social sciences. Within such a framework, professionals from different disciplines tend to approach problems exclusively from the standpoint of their respective fields, competing for their own "share of the pie," which results in narrow and one-sided interpretations. This approach frequently generates new sources of conflict among experts, as different disciplines do not recognize each other as complementary but rather as competing, further hindering the effective resolution of complex issues.

This fragmentation is particularly problematic when it comes to environmental issues, which inherently require a holistic approach. Health problems caused by environmental factors—such as pollution, climate change, exposure to harmful substances or nanoparticles, and the influence of the social environment—cannot be adequately understood or addressed if viewed only through the lens of a single scientific discipline. The environment is a comprehensive system, and the complex problems that arise from it must be addressed integratively—by taking into account all relevant aspects that may contribute to their resolution.

For the implementation of postgraduate studies in this field, transdisciplinary collaboration between various disciplines is essential—not only at the level of information exchange but through active integration and intertwining of different methodologies and perspectives to arrive at innovative and sustainable solutions. The range of risks to both the environment and human health in modern society is expanding daily. Today, some of the most significant health risk factors did not even exist a few years or decades ago. For the same reasons, the approach to environmental and health risk issues has become increasingly challenging, even in developed countries.

In many critical situations related to environmental and human health protection, various countries have failed to provide adequate responses. Examples include increasingly frequent emergencies (floods, industrial and traffic accidents), air pollution, new mining facilities, COVID, food safety concerns, internet addiction, and social crises. One of the key reasons has been the lack of appropriately trained professionals capable of understanding these problems comprehensively and advising both the public and authorities on proper responses. An analysis of these challenges reveals the need for an educational system that produces experts capable of responding adequately to contemporary challenges in environmental and public health protection, through the acquisition of transdisciplinary knowledge.

Existing educational models in postgraduate medical education are not equipped to produce such professionals. Therefore, it is necessary to transform the educational process through direct intervention in the learning concept by implementing MCPB (Meta-Cognitive Problem-Based) modules. This transformation is operationalized through the use of problem-based blended learning blocks (TransBlox) which integrate transdisciplinary knowledge and complement theoretical and practical teaching within blended learning courses hosted on the Moodle platform. Within these modules, after the introductory text that defines the problem and research objective, each subsequent step includes guided questions tailored to solving the presented problem. These questions are designed to be interactive, allowing students to choose from offered responses or enter answers in designated fields. By responding to these guided questions, students gradually identify key components to clarify and, by following the logical sequence of inquiry, learn how to solve the problem systematically. The use of enhanced modules enables the integration of transdisciplinary knowledge into postgraduate medical curricula, ensures maximum objectivity in teaching and assessment, and enhances the transparency and democratization of the overall educational process.

Keywords: Transdisciplinarity, metacognition, postgraduate medical education

DEPRESIJA, ANKSIOZNOST I STRES U STUDENSTKOJ POPULACIJI

DEPRESSION, ANXIETY AND STRESS AMONG THE STUDENT POPULATION

Elma Selimi¹, Đorđe Ilić¹¹ Medicinski fakultet Univerziteta u Prištini - Kosovska Mitrovica, Srbija

SAŽETAK

Uvod: Problemi sa mentalnim zdravljem postaju sve zastupljeniji i među studentima. Istraživanja su pokazala da gotovo polovina univerzitetskih studenata pokazuje umerene nivo mentalnih problema povezanih sa stresom, uključujući i anksioznost i depresiju.

Cilj rada: Utvrditi prevalenciju anksioznosti, depresije i stresa u studentskoj populaciji.

Materijal i metod rada: Istraživanje je urađeno kao studija preseka. Kao instrument istraživanja korišćena

je skala za procenu depresivnosti, anksioznosti i stresa (DASS-42). Od statističkih metoda korišćeni su hi- kvadrat i Mann-Whitney test, sa nivoom značajnosti od 0,05.

Rezultati: U istraživanju je učestvovalo 600 studenata, od kojih je 34% bilo muškog pola, a 66% ženskog pola. Prosečna starosna dob studenata je iznosila 20.2±1.5 a studentkinja 19.9±1.4. Analiza skale anksioznosti je pokazala da 6,7% studenata ima blagu anksioznost, 7,3% srednje tešku, dok je 12,8%

imalo ekstremno tešku anksioznost. Skala depresije je pokazala, da je blagi osećaj depresivnosti prisutan kod 5,8% studenata, umereni 4,8%, teški 1,5%, dok je ekstremno teški osećaj bio prisutan kod 15,8% studenata. Na skali stresa, 10,2% studenata je osetilo blagi stres, umeren stres je bio prisutan kod 6,7%

studenata, dok je jak stres imalo 6,7%. Učestalost povišenog stresa je značajno učestalija kod studenata ženskog pola (hi kvadrat=14.914, p<0.001). Povišen stres je bio zastupljen kod 33,1% ženskog pola a 18,1% kod muškog pola. Anksioznost je značajno izraženija kod studentkinja u odnosu na studente (hi kvadrat=6,204, p<0.013) a za depresiju nema značajne razlike između polova. Kada je u pitanju fakultet, studenti sa medicine su imali znatno manje izražene simptome depresije, stresa i anksioznosti u odnosu na studente sa drugih fakulteta.

Zaključak: Studenti medicine imaju znatno niži stepen depresije, stresa i anksioznosti u odnosu na studente sa drugih fakulteta. Anksioznost i stres je izraženija kod studentkinja u odnosu na studente.

Ključne reči: Studenti, DASS-42, stres, anksioznost, depresija.

ABSTRACT

Introduction: Mental health problems are becoming increasingly common among students. Research has shown that nearly half of university students exhibit moderate levels of stress-related mental health issues, including anxiety and depression.

Objective: To determine the prevalence of anxiety, depression, and stress among the student population.

Materials and Methods: This research was conducted as a cross-sectional study. The instrument used for assessment was the Depression, Anxiety, and Stress Scale (DASS-42). Statistical methods included the chi-square test and the Mann-Whitney tests, with a significance level of 0.05.

Results: The study included 600 students, of whom 34% were male and 66% female. The average age of male students was 20.2±1.5, and female students 19.9±1.4 years. Anxiety scale analysis showed that 6.7% of students had mild anxiety, 7.3% moderate, and 12.8% extremely severe anxiety. The depression scale indicated that 5.8% had mild depressive feelings, 4.8% moderate, 1.5% severe, and 15.8% extremely severe. On the stress scale, 10.2% experienced mild stress, 6.7% moderate stress, and 6.7%

severe stress. The prevalence of elevated stress was significantly higher among female students (chi-square=14.914, p<0.001), with 33.1% of females and 18.1% of males affected. Anxiety was significantly more prevalent among female students compared to male students (chi-square=6.204, p<0.013), while there was no significant gender difference in depression levels. Medical students reported significantly lower levels of depression, stress, and anxiety compared to students from other faculties.

Conclusion: Medical students exhibit significantly lower levels of depression, stress, and anxiety compared to students from other faculties. Anxiety and stress are more prevalent among female students than their male counterparts.

ZDRAVSTVENE KARAKTERISTIKE FLAŠIRANE VODE U MALOPRODAJNIM OBJEKTIMA U KOSOVSKOJ MITROVICI

HEALTH CHARACTERISTICS OF BOTTLED WATER IN RETAIL STORES IN KOSOVSKA MITROVICA

Ivana Mitrović¹, Anastasija¹

1 Medicinski fakultet Univerziteta u Prištini - Kosovska Mitrovica, Srbija

SAŽETAK

Uvod: Po pravilniku o kvalitetu i drugim zahtevima za vodu u flaši koja se nalazi u prometu (prirodnu mineralnu, prirodnu izvorsku i stonu vodu), proizvođač je dužan da pre početka proizvodnje pribavi izveštaje o izvršenom ispitivanju zdravstvene ispravnosti voda (fizičke, hemijske, mikrobiološke karakteristike, gasni i radiološki sastav) (1). Ispitivanje zdravstvenih karakteristika flaširane vode je posle najnovijih preporuka Svetske Zdravstvene Organizacije postalo jedna od vodećih tema u medicini. Potrošači ne biraju vodu po mineralnom sastavu. Zato istraživanja pokazuju da konzumiranje flaširane vode nosi značajne zdravstvene rizike sa kojima su konzumenti retko upoznati (2). Ipak konzumiranje flaširane vode može doneti i određene benefite po zdravlje.

Cilj: Utvrđivanje prisutnih vrsta flaširane vode u maloprodajnim objektima u Kosovskoj Mitrovici kao i analiza njihovih zdravstvenih karakteristika.

Metode: Anketom na terenu prikupili smo podatke o flaširanoj vodi iz 15 od ukupno 24 maloprodajnih objekata u Kosovskoj Mitrovici. Vodu smo analizirali prema mineralnom sastavu.

Rezultati: Najčešće se u maloprodajnim objektima nalaze vode Knjaz Miloš i Aqua viva. Još se u prodaji mogu naći sledeće vode: Rosa, Dea, Voda voda, Suza, Zagori, Vrnjačko vrelo, Jana, Izvorka, Ana, Radenska, Donat Mg, Pelisterka, Mivela, Vrnjci i Kiseljak. Radenska je voda sa značajnim sadržajem kalcijuma, dok su Mivela i Donat Mg vode sa značajnom koncentracijom magnezijuma. Voda Vrnjci ima značajnu količinu kalijuma. Takođe, veći broj voda sadrži značajnu količinu natrijuma. Slabomineralne vode Voda voda i Aqua viva sadrže optimalnu količinu fluorida.

Zaključak: Na tržištu je u ponudi paleta najrazličitijih voda u flaši koje sa sobom nose čitav spektar mogućih zdravstvenih rizika ali i zdravstvenih benefita. Neophodno je upoznati stanovništvo sa velikim značajem koje odabir mineralne vode može imati po njihovo zdravlje.

ABSTRACT

Introduction: According to the regulations on quality and other requirements for bottled water available on the market (natural mineral, natural spring, and table water), the manufacturer is obliged, before production, to obtain reports on testing the water's health safety (physical, chemical, microbiological characteristics, gas and radiological composition). Following the latest recommendations of the World Health Organization, the examination of health characteristics of bottled water has become one of the leading topics in medicine. Consumers do not choose water based on their mineral composition. Therefore, studies show that consuming bottled water carries significant health risks that consumers are rarely aware of. However, bottled water consumption can also bring certain health benefits.

The Aim: To determine the types of bottled water available in retail stores in Kosovska Mitrovica and to analyze their health characteristics.

Methods: A field survey collected data on bottled water from 15 out of a total of 24 retail outlets in Kosovska Mitrovica. The water was analyzed according to its mineral composition.

Results: The most common brands in retail stores were Knjaz Milos and Aqua Viva. The following waters were also: Rosa, Dea, Voda Voda, Suza, Zagori, Vrnjacko Vrelo, Jana, Izvorka, Ana, Radenska, Donat Mg, Pelisterka, Mivela, Vrnjci and Kiseljak. Radenska has a significant calcium content, while Mivela and Donat Mg have a significant magnesium concentration. Vrnjci contains a significant amount of potassium. Also, a larger number of waters contain a significant amount of sodium. Low-mineral waters Voda Voda and Aqua Viva contain an optimal amount of fluoride.

Conclusion: A wide range of bottled waters is available on the market, carrying a spectrum of possible health risks as well as health benefits. It is necessary to educate the population about the great importance that the choice of mineral water can have for their health.

Keywords: bottled water ; mineral water composition

UPOTREBA DRUŠTVENIH MREŽA I INTERNET PLATFORMI U CILJU UNAPREĐENJA UČENJA STUDENATA MEDICINE

USE OF SOCIAL NETWORKS AND INTERNET PLATFORMS TO ENHANCE MEDICAL STUDENTS' LEARNING

Jelena Cvetković¹

1 Medicinski fakultet Univerziteta u Prištini - Kosovska Mitrovica, Srbija

SAŽETAK

Uvod: U digitalnom dobu, internet platforme i društvene mreže sve više postaju deo obrazovnog procesa. Iako se često tretiraju kao faktori koji odvlače pažnju, njihova pravilna upotreba može poboljšati razumevanje složenih pojmova.

Cilj: Ispitati u kojoj mjeri studenti medicine koriste društvene mreže i internet platforme u svrhu učenja, kao i analizirati uticaj edukativnog videa postavljenog na TikTok platformi na rezultate drugog kolokvijuma iz statistike.

Materijali i metode: Istraživanje je sprovedeno u zimskom semestru 2023. godine, među studentima Medicinskog fakulteta Univerziteta u Prištini. Podatke smo prikupili anketom i obradili ih deskriptivnim statističkim metodama koristeći SPSS 21. Kao dodatni edukativni materijal, korišćen je kratak video postavljen na društvenu mrežu TikTok, sa ciljem pojašnjenja oblasti relevantne za drugi kolokvijum iz statistike. Analizirane su navike u učenju, vreme provedeno na mrežama, kao i poznavanje edukativnih kanala kao što su Ninja Nerd i Osmosis.

Rezultati: Svi ispitanici koriste društvene mreže, pri čemu 48,48% studenata navodi da ih koristi između jedan i tri sata dnevno, a čak 39% više od tri sata. Uprkos visokoj zastupljenosti u svakodnevici, samo mali broj studenata koristi edukativne internet platforme - 22% prati kanal Ninja Nerd, dok svega 5% prati Osmosis. Svi studenti koji prate ove kanale izjavili su da im je sadržaj bio od koristi prilikom učenja. Od ukupno 52 studenta, 75% je tačno odgovorilo na oba pitanja, što predstavlja značajan porast u odnosu na prethodni kolokvijum, na kojem je većina studenata imala jedan ili nijedan tačan odgovor. Samo 7,7% studenata nije dalo nijedan tačan odgovor nakon videa, dok je 17,3% imalo jedan tačan odgovor.

Zaključak: Iako je korišćenje edukativnih internet sadržaja i dalje ograničeno, studenti koji ih koriste pokazuju bolji uspeh. Potrebno je ohrabriti studente da iskoriste potencijal mreža u edukativne svrhe, integrišući učenje u njihovu svakodnevicu.

Ključne reči: društvene mreže, studenti medicine, učenje, internet platforme, TikTok

ABSTRACT

Objective: To examine the extent to which medical students use social media and internet platforms for learning purposes, and to analyze the impact of an educational video posted on the TikTok platform on the results of the second statistics colloquium.

Materials and Methods: The research was conducted during the winter semester of 2023 among students of the Faculty of Medicine, University of Priština. Data were collected through a questionnaire and processed using descriptive statistical methods in SPSS 21. As additional educational material, a short video was posted on the social media platform TikTok, aimed at clarifying a topic relevant for the second statistics colloquium. The analysis included learning habits, time spent on social networks, and familiarity with educational channels such as Ninja Nerd and Osmosis.

Results: All respondents use social media, with 48.48% reporting daily usage of one to three hours, and 39% more than three hours. Despite their widespread presence in daily life, only a small number of students use educational internet platforms - 22% follow Ninja Nerd, while only 5% follow Osmosis. All students who follow these channels reported that the content was helpful in their studies. After the educational TikTok video, 75% of the 52 students answered both questions correctly, a significant improvement compared to the previous colloquium.

Conclusion: Although the use of educational online content remains limited, students who utilize it show better academic performance. Students should be encouraged to harness the potential of social media for educational purposes by integrating learning into their daily routines.

Keywords: social media, medical students, learning, internet platforms, TikTok

UPOTREBA ALKOHOLA I DRUGIH PSIHOAKTIVNIH SUPSTANCI MEĐU UČENICIMA SREDNJIH ŠKOLA

USE OF ALCOHOL AND OTHER PSYCHOACTIVE SUBSTANCES AMONG HIGH SCHOOL STUDENTS

Emin Bajramlić¹, Milica Kovačević¹

¹ Medicinski fakultet Univerziteta u Prištini - Kosovska Mitrovica, Srbija

SAŽETAK

Uvod: Upotreba alkohola i psihoaktivnih supstanci među srednjoškolicima predstavlja ozbiljan javnozdravstveni problem. Adolescencija je osetljiv period razvoja, a konzumacija ovih supstanci može dovesti do zavisnosti, problema u ponašanju, kognitivnih poremećaja i povećanog rizika od povreda... Rano eksperimentisanje često vodi ka dugotrajnim obrascima upotrebe u odraslom dobu. Zbog sve veće dostupnosti i normalizacije konzumacije među mladima, istraživanje na ovu temu je od posebnog značaja. Cilj rada: Cilj istraživanja je da se ispita učestalost i obrasci upotrebe alkohola i drugih psihoaktivnih supstanci među učenicima srednjih škola.

Metodologija: Podaci su prikupljeni putem anonimnih upitnika koje su učenici dobrovoljno popunjavali. Statistička obrada podataka izvršena je uz nivo značajnosti $p = 0,05$.

Rezultati: U studiju je uključeno 109 učenika, prosečne starosti $17,31 \pm 1,14$, od kojih je 73,4% bilo ženskog pola. Više od trećine (37,6%) učenika srednje škole je navelo da jednom mesečno konzumira alkohol, a 24,8% da konzumira alkohol 2-4 puta mesečno. Što se tiče konzumacije duvana 14,7% su pušači. U malom procentu, 3,7% učenika je izjavilo da koristi neku vrstu droge, a 1,8% da ih je koristilo u ranijem periodu. Što se tiče upotrebe droga, većinski su prijavili da koriste marihuana, a samo je jedan učenik prijavio konzumiranje kokaina. Lekove za smirenje je koristilo 10,1% učenika.

Zaključak: Dobijeni podaci mogu doprineti boljem razumevanju rasprostranjenosti i obrazaca konzumacije psihoaktivnih supstanci kod srednjoškolaca. Rezultati će poslužiti kao osnova za kreiranje preventivnih programa i edukativnih aktivnosti usmerenih ka smanjenju upotrebe ovih supstanci među mladima.

Ključne reči: alkohol, psihoaktivne supstance, adolescenti, srednje škole, prevencija.

ABSTRACT

Introduction: The use of alcohol and psychoactive substances among high school students represents a serious public health issue. Adolescence is a sensitive developmental period, and the consumption of these substances can lead to addiction, behavioral problems, cognitive impairments, and an increased risk of injuries. Early experimentation often leads to long-term patterns of use in adulthood. Due to increasing availability and normalization of consumption among youth, research on this topic is of particular importance.

Aim of the study: The aim of this study is to examine the prevalence and patterns of alcohol and psychoactive substance use among high school students.

Methodology: Data were collected through anonymous questionnaires voluntarily completed by students. Statistical analysis was performed with a significance level of $p = 0.05$.

Results: The study included 109 students, with an average age of 17.31 ± 1.14 , of whom 73.4% were female. More than one-third (37.6%) of the students reported consuming alcohol once a month, while 24.8% reported drinking alcohol 2-4 times a month. Regarding tobacco use, 14.7% were smokers. A small percentage (3.7%) reported using some type of drug, and 1.8% stated they had used drugs in the past. Among those who reported drug use, most mentioned marijuana, with only one student reporting cocaine use. Tranquilizers had been used by 10.1% of the students.

Conclusion: The obtained data can contribute to a better understanding of the prevalence and patterns of psychoactive substance use among high school students. The results will serve as a basis for developing preventive programs and educational activities aimed at reducing the use of these substances among youth.

Keywords: alcohol, psychoactive substances, adolescents, high schools, prevention.

POVEZANOST KORIŠĆENJA MOBILNOG TELEFONA SA KVALITETOM SNA KOD STUDENATA

THE RELATIONSHIP OF MOBILE PHONE USE WITH THE QUALITY OF SLEEP AMONG STUDENTS

Tima Ličina¹, Amra Miralemović¹

Institut za fiziologiju, Medicinski fakultet Univerziteta u Prištini, Kosovska Mitrovica

SAŽETAK

Uvod: San predstavlja ključnu komponentu fizičkog i mentalnog zdravlja, a njegov kvalitet posebno je važan u periodu studiranja. Studenti su populacija koja je podložna raznim faktorima koji negativno utiču na san. Jedan od značajnih faktora koji se sve češće ispituje jeste učestala upotreba mobilnih telefona, naročito u večernjim satima. Plavo svetlo koje emituju ekrani, kao i kognitivna i emocionalna stimulacija, mogu negativno uticati na usvajanje sna i osećaj odmornosti.

Cilj rada: Cilj ovog istraživanja je da se proceni subjektivni kvalitet sna kod studenata, kao i da se ispita povezanost između korišćenja mobilnih telefona, ukupno i u večernjim satima, i kvaliteta sna kod studenata.

Materijal i metode: Istraživanje je sprovedeno kao presečna studija kojom je obuhvaćeno 276 studenata $22,6 \pm 2,9$; 205 ženskog i 71 muškog pola. Podaci su prikupljeni pomoću online anonimnog upitnika koji je sadržao pitanja o navikama korišćenja telefona i standardizovani Pittsburgh Sleep Quality Index (PSQI).

Rezultati: Većina ispitanika (77,5%) koristi mobilni telefon više od 4 sata dnevno. Period od 23.00 do 00.59 je bio najčešći odlazak na spavanje (54,7%), zatim period od 01.00-02.59 (31,9%). U periodu od 21.00 do 22.59 na spavanje je odlazilo 6,9% ispitanika, a u periodu nakon 03.00 6,5%. Loš kvalitet sna je zabeležen kod 163 ispitanika ($n = 59,1\%$). Utvrđena je slaba, ali statistički značajna korelacija između vremena provedenog na mobilnom telefonu i PSQI ($r = 0,28$; $p < 0,001$). Takođe, između korišćenja telefona u večernjim satima i PSQI pronađena je slaba, ali statistički značajna korelacija ($r = 0,27$; $p < 0,001$).

Zaključak: Nalazi ukazuju da postoji statistički značajna povezanost između učestalosti korišćenja mobilnog telefona i lošijeg kvaliteta sna kod studenata. Iako su korelacije slabe, rezultati pokazuju potrebu za podizanjem svesti o štetnim efektima kasne upotrebe digitalnih uređaja i promovisanjem higijene spavanja kao važne komponente studentskog zdravlja.

Ključne reči: kvalitet sna, studenti, večernja upotreba mobilnih telefona

ABSTRACT

Introduction: Sleep is a key component of physical and mental health, and its quality is especially important during the study period. Students are particularly vulnerable to various factors that negatively affect sleep. One important factor increasingly being examined is frequent mobile phone use, especially in the evening. Blue light from screens and cognitive or emotional stimulation may impair falling asleep, total sleep time, and the feeling of restfulness.

The Aim: The aim of this study was to evaluate students' subjective sleep quality and to examine the relationship between mobile phone use—overall and in the evening—and sleep quality.

Material and methods: This cross-sectional study included 276 students (age 22.6 ± 2.9), 205 female and 71 male. Data were collected via an anonymous online questionnaire that included questions on phone usage habits and the standardized Pittsburgh Sleep Quality Index (PSQI).

Results: Most respondents (77.5%) used a mobile phone for more than 4 hours daily. The most common bedtime was between 23:00 and 00:59 (54.7%), followed by 01:00 to 02:59 (31.9%). Only 6.9% went to sleep between 21:00 and 22:59, and 6.5% after 03:00. Poor sleep quality was observed in 163 respondents (59.1%). A weak but statistically significant correlation was found between total phone use and PSQI ($r = 0.28$; $p < 0.001$), and between evening phone use and PSQI ($r = 0.27$; $p < 0.001$).

Conclusion: The findings indicate a statistically significant association between frequent mobile phone use and poorer sleep quality among students. Although the correlations are weak, the results highlight the importance of raising awareness about the adverse effects of late digital device use and promoting sleep hygiene as a vital aspect of student health.

Key words: sleep quality, students, evening screen time

GLJIVIČNE INFEKCIJE KOD IMUNODEFICIJENTNIH PACIJENATA

FUNGAL INFECTIONS IN IMMUNODEFICIENCY PATIENTS

Nataša Katanić¹, Jasmina Poluga², Jovan Malinić²

1 Medicinski fakultet u Prištini sa sedištem u Kosovskoj Mitrovici

2 Klinika za infektivne i tropske bolesti KCS Srbije

SAŽETAK

Uvod: Gljivične infekcije u humanoju populaciji se manifestuju na koži i kosmatim delovima tela, ali i kao sistemske i invazivne. Invazivne se najčešće javljaju kod pacijenata sa primarnim i stečenim imunodeficijencijama, kao oportunističke infekcije s visokim kako morbiditetom tako i mortalitetom.

Prikaz bolesnika s kriptokoknim meningoencefalitisom obolelog od karcinoma prostate Pacijent star 68 godina lečen od 05.01.2017. - 24.02.2017. u Klinici za infektivne i tropske bolesti u Beogradu u Odeljenju za neuroinfekcije, zbog glavobolje, bezvoljnosti, visoke temperature, gubitka svesti. Tri meseca pre pojave tegoba je lečen u Klinici za plućne bolesti zbog infiltracije u plućima, zbog čega je između ostalog dobio i kortikosteroidnu terapiju u trajanju od tri meseca. U ličnoj anamnezi karcinom prostate (zakazana operacija), hronična kardiomiopatija, tri infarkta miokarda, ulkus želudca. Na prijemu febrilan, dezorjentisan, bled, tahipnoičan, tahikardičan. Nad plućima obostrano čujni pukoti. Meningealni znaci pozitivni. U cerebrospinalnoj tečnosti 122 elementa (90 %segmentiranih leukocita), hipoglikorahija, hiperproteinorahija. Likvorokulturom dokazan *Cryptococcus neoformans*. Lečen amfotericinom i flukonazolom, nakon čega dolazi do povlačenja tegoba, normalizacije kliničkog nalaza, povlačenja promena na plućima i normalizacije citobiohemijskog i mikrobiološkog nalaza u cerebrospinalnoj tečnosti. Maja 2017 godine uradjena radikalna prostatektomija (adenokarcinom). Kontrolisan u Klinici za infektivne i tropske bolesti tokom 2017 i 2018 godine (uredan klinički nalaz). Pacijent je 2020 godine preminuo zbog karcinoma prostate.

Prikaz bolesnika lečenog kortikosteroidnom terapijom u toku COVID-19 pandemije Pacijent star 58 godina, lečen od COVIDA-19 avgusta i septembra 2021 godine terapijom po protokolu za ovu bolest, kada je primao i kortikosteroidnu terapiju. Januara 2022 pacijent je lečen Amphotericinom B zbog patohistološki verifikovane mukormikoze na tvrdom nepcu. Nakon terapije je uradjena totalna maksilektomija desno i parcijalna levo zbog ekstenzivnih promena izazvanih gljivicom. Oktobra 2022 hospitalizovan radi lečenja temporalnog cerebritisa, sa znacima abscediranja, uz laminarni subduralni empijem temporobazalno desno verifikovan na NMR endokranijuma. Lečen liposomalnim Amfotericinom B. U toku hospitalizacije konsultovan maksilofacijalni hirurrg koji nije indikovao endoskopsku intervenciju. Obzirom da je na kontrolnom NMR endokranijuma videna progresija lezija uradjena je neurohirurška operacija kada je i patohistološki potvrđena cerebralna mukormikoza. Lečenje Amfotericinom B je u toku.

Zaključak: Kod imunokompromitovanih bolesnika je neophodno na vreme razmotriti prisustvo retkih gljivičnih infekcija, te na vreme započeti lečenje.

Ključne reči: kriptokokni meningoencefalitis, mukormikoza

ABSTRACT

Introduction: Fungal infections in the human population manifest themselves on the skin and hairy parts of the body, but also as systemic and invasive. Invasive infections most often occur in patients with primary and acquired immunodeficiencies, as opportunistic infections with high morbidity and mortality.

Case report of a patient with cryptococcal meningoencephalitis suffering from prostate cancer

A 68-year-old patient was treated from 05.01.2017. to 24.02.2017. at the Clinic for Infectious and Tropical Diseases in Belgrade in the Department of Neuroinfections, due to headache, listlessness, high fever, loss of consciousness. Three months before the onset of symptoms, he was treated at the Clinic for Pulmonary Diseases due to infiltration in the lungs, for which, among other things, he received corticosteroid therapy for three months. Personal history: prostate cancer (scheduled surgery), chronic cardiomyopathy, three myocardial infarctions, gastric ulcer. On admission, febrile, disoriented, pale, tachypneic, tachycardic. Bilateral audible crackles over the lungs. Meningeal signs positive. Cerebrospinal fluid: 122 elements (90% segmented leukocytes), hypoglycorrhagia, hyperproteinorrhagia. *Cryptococcus neoformans* confirmed by cerebrospinal fluid culture. Treated with amphotericin and fluconazole, after which symptoms resolved, clinical findings normalized, lung changes resolved, and cytobiochemical and microbiological findings in the cerebrospinal fluid normalized. Radical prostatectomy (adenocarcinoma) was performed in May 2017. Controlled at the Clinic for Infectious and Tropical Diseases during 2017 and 2018 (correct clinical findings). The patient died in 2020 due to prostate cancer.

Case report of a patient treated with corticosteroid therapy during the COVID-19 pandemic

A 58-year-old patient, treated for COVID-19 in August and September 2021 with therapy according to the protocol for this disease, when he also received corticosteroid therapy. In January 2022, the patient was treated with Amphotericin B due to pathohistologically verified mucormycosis on the hard palate. After therapy, a total maxillectomy was performed on the right and a partial maxillectomy on the left due to extensive changes caused by the fungus. In October 2022, he was hospitalized for treatment of temporal cerebritis, with signs of abscessation, with laminar subdural empyema on the right temporobasal verified on endocranial MRI. Treated with liposomal Amphotericin B. During hospitalization, a maxillofacial surgeon was consulted who did not indicate endoscopic intervention. Considering that the progression of the lesions was seen on the control endocranial MRI, a neurosurgical operation was performed when cerebral mucormycosis was also confirmed pathohistologically. Treatment with Amphotericin B is ongoing.

Conclusion: In immunocompromised patients, it is necessary to consider the presence of rare fungal infections in a timely manner and to start treatment in a timely manner.

Keywords: cryptococcal meningoencephalitis, mucormycosis, immunodeficiency

CIP - Каталогизација у публикацији Народна библиотека Србије, Београд

616(048)

616-084(048)

КОНГРЕС лекара Косова и Метохије (2 ; 2025 ; Косовска Митровица)

Knjiga sažetaka. 3, [Preventivna medicina] : "Drugi kongres lekara Kosova i Metohije" u susret Vidovdanu, jun 2025. Kosovska Mitrovica / [urednik Bojana Kisić]. - Косовска итровица : Medicinski fakultet Univerziteta u Prištini, 2025 (Niš : Sven). - 52 str. ; 30 cm. - (Praxis medica / [Medicinski fakultet Univerziteta u Prištini])

Tiraž 50. - Apstrakti uporedo na srp. i engl. jeziku. - Str. 7: Uvodna reč / Aleksandar Pavlović, Tatjana Novaković. - Bibliografija uz pojedine apstrakte.

ISBN 978-86-81824-46-7 (niz)

ISBN 978-86-81824-44-3

a) Медицина -- Апстракти b) Превентивна медицина -- Апстракти

COBISS.SR-ID 171666953