



ISSN 2737-971X
eISSN 2737-9752

SERBIAN JOURNAL OF THE MEDICAL CHAMBER

SRPSKI MEDICINSKI ČASOPIS LEKARSKE KOMORE

VOLUMEN 5 • BROJ 4 • DECEMBAR 2024.
VOLUME 5 • NUMBER 4 • DECEMBER 2024

ISSN 2737-971X
eISSN 2737-9752

SRPSKI MEDICINSKI ČASOPIS LEKARSKE KOMORE



SERBIAN JOURNAL OF THE MEDICAL CHAMBER

VOLUMEN 5 • BROJ 4 • DECEMBAR 2024.
VOLUME 5 • NUMBER 4 • DECEMBER 2024

OSNIVAČ, VLASNIK, IZDAVAČ

Lekarska komora Srbije
Kraljice Natalije 1-3, 11000 Beograd, Srbija

SUIZDAVAČ

Institut za medicinska istraživanja, Univerzitet u Beogradu
Dr Subotića 4, p.p. 102, 11129 Beograd, Srbija

FOUNDER, OWNER & PUBLISHER

Serbian Medical Chamber
1-3 Kraljice Natalije Street, 11000 Belgrade, Serbia

CO-PUBLISHER

Institute for Medical Research, University of Belgrade
4 Dr Subotića Street, P.O. Box 102, 11129 Belgrade, Serbia

UREDNIŠTVO

Glavni i odgovorni urednik

Prof. dr Milena Šantrić-Milićević
*Univerzitet u Beogradu, Medicinski fakultet, Institut za
socijalnu medicinu, Srbija*

Zamenik glavnog urednika

Prof. dr Goran Tulić
*Univerzitetski klinički centar Srbije, Klinika za ortopedsku
hirurgiju i traumatologiju; Univerzitet u Beogradu,
Medicinski fakultet, Srbija*

Pomoćnici glavnog i odgovornog urednika

Prof. dr Predrag Đurđević
*Univerzitetski klinički centar Kragujevac, Klinika za
hematologiju; Univerzitet u Kragujevcu, Fakultet
medicinskih nauka, Srbija*

Prof. dr Milena Todorović Balint
*Univerzitetski klinički centar Srbije, Klinika za
hematologiju; Univerzitet u Beogradu, Medicinski
fakultet, Srbija*

Prof. dr Bojan Zarić
*Univerzitet u Novom Sadu, Medicinski fakultet, Institut
za plućne bolesti Vojvodine, Klinika za pulmološku
onkologiju, Srbija*

Dr Saša Radovanović, naučni savetnik
*Univerzitet u Beogradu, Institut za medicinska
istraživanja, Srbija*

Prof. dr Aleksandra Ilić
*Univerzitet u Prištini – Kosovska Mitrovica, Medicinski
fakultet, Centar za biostatistiku i informacione
tehnologije, Srbija*

Doc. dr Mlađan Golubović
*Univerzitetski klinički centar Niš, Klinika za
kardiohirurgiju; Univerzitet u Nišu, Medicinski fakultet,
Srbija*

EDITORIAL OFFICE

Editor-in-Chief

Prof. Milena Šantrić-Milićević, MD, PhD
*University of Belgrade, Faculty of Medicine, Institute of
Social Medicine, Serbia*

Deputy Editor-in-Chief

Prof. Goran Tulić, MD, PhD
*University Clinical Center of Serbia, Clinic for Orthopedic
Surgery and Traumatology; University of Belgrade, Faculty
of Medicine, Serbia*

Assistant Editor-in-Chief

Prof. Predrag Đurđević, MD, PhD
*University Clinical Center Kragujevac, Clinic for
Hematology; University of Kragujevac, Faculty of Medical
Sciences, Serbia*

Prof. Milena Todorović Balint, MD, PhD
*University Clinical Center of Serbia, Clinic for
Hematology; University of Belgrade, Faculty of Medicine,
Serbia*

Prof. Bojan Zarić, MD, PhD
*University of Novi Sad, Faculty of Medicine, Institute for
Pulmonary Diseases of Vojvodina, Clinic for Thoracic
Oncology, Serbia*

Res. Prof. Saša Radovanović, MD, PhD
*University of Belgrade, Institute for Medical Research,
Serbia*

Prof. Aleksandra Ilić, MD, PhD
*University of Pristina – Kosovska Mitrovica, Faculty
of Medicine, Center for Biostatistics and Information
Technology, Serbia*

Asst. Prof. Mlađan Golubović, MD, PhD
*University Clinical Center Niš, Cardiovascular and
Transplant Surgery Clinic; University of Niš, Faculty of
Medicine, Serbia*

Tehnički urednik

Prof. dr Zoran Bukumirić
Univerzitet u Beogradu, Medicinski fakultet, Institut za medicinsku statistiku i informatiku, Srbija

Sekretar

Asist. dr sci. med. Aleksandra Radovanović Spurnić,
Univerzitetski klinički centar Srbije, Klinika za infektivne i tropske bolesti; Univerzitet u Beogradu, Medicinski fakultet, Srbija

Lektori i prevodioci za srpski i engleski jezik

Biljana Vukčević Lacković, prof. engleskog jezika
Danka Sinadinović, prof. engleskog jezika
Danijela Bulatović, prof. engleskog jezika

Technical Editor

Prof. Zoran Bukumirić, MD, PhD
University of Belgrade, Faculty of Medicine, Institute for Medical Statistics and Informatics, Serbia

Secretary

TA Aleksandra Radovanović Spurnić, MD, PhD
University Clinical Center of Serbia, Clinic for Infectious and Tropical Diseases; University of Belgrade, Faculty of Medicine, Serbia

Serbian and English Language Editors

Biljana Vukčević Lacković, English language teacher
Danka Sinadinović, English language teacher
Danijela Bulatović, English language teacher

IZDAVAČKI SAVET

Predsednik

Asist. dr sci. med. Danilo Jeremić

Članovi

Spec. dr med. Miodrag Stanić
Dr med. Milan Dinić
Prof. dr Boris Đinđić
Prof. dr Dejan Sakač
Mr sci. med. Slađana Ilić
Spec. dr med. Ksenija Turković

PUBLISHER'S ADVISORY BOARD

President

TA Danilo Jeremić, MD, PhD

Members

Miodrag Stanić, MD
Milan Dinić, MD
Prof. Boris Đinđić, MD, PhD
Prof. Dejan Sakač, MD, PhD
Slađana Ilić, MD, MSc
Ksenija Turković, MD

UREĐIVAČKI ODBOR

Predsednik

Akademik prof. dr Bela Balint

Članovi

Akademik prof. dr Vladimir Kostić

Akademik prof. dr Nebojša Lalić

Akademik prof. dr Predrag Peško

Prof. dr Milena Šantrić-Milićević

Prof. dr Ivan Paunović

Prof. dr Zoran Baščarević

Prof. dr Eleonora Gvozdenović

Prof. dr Goran Tulić

Prof. dr Dejan Nešić

Prof. dr Mirjana Šumarac-Dumanović

Prof. dr Milena Todorović Balint

Prof. dr Nemanja Slavković

Prof. dr Aleksandar Pavlović

Prof. dr Milica Mijović

Prof. dr Dobrila Stanković-Đorđević

Prof. dr Predrag Đurđević

Prof. dr Svetlana Radević

Prof. dr Slobodanka Mitrović

Prof. dr Zoran Bukumirić

Dr Saša Radovanović, naučni savetnik

Prof. dr Aleksandra Ilić

Doc. dr Mlađan Golubović

Doc. dr Marija Zdravković

Doc. dr Marija Milić

Doc. dr Vojin Kovačević

Doc. dr Dejana Ružić Zečević

Doc. dr Jagoš Golubović

Doc. dr Darko Laketić

Doc. dr Jelena Milenković

Doc. dr Mihailo Stjepanović

Dr Irina Maslovarić, naučni saradnik

Asist. dr sci. med. Aleksandra Radovanović Spurnić

Asist. dr Kristina Davidović

Asist. dr Igor Spurnić

Asist. dr sci. med. Tomi Kovačević

Asist. dr Andrej Preveden

EDITORIAL BOARD

President

Academician Prof. Bela Balint, MD, PhD

Members

Academician Prof. Vladimir Kostić, MD, PhD

Academician Prof. Nebojša Lalić, MD, PhD

Academician Prof. Predrag Peško, MD, PhD

Prof. Milena Šantrić-Milićević, MD, PhD

Prof. Ivan Paunović, MD, PhD

Prof. Zoran Baščarević, MD, PhD

Prof. Eleonora Gvozdenović, MD, PhD

Prof. Goran Tulić, MD, PhD

Prof. Dejan Nešić, MD, PhD

Prof. Mirjana Šumarac-Dumanović, MD, PhD

Prof. Milena Todorović Balint, MD, PhD

Prof. Nemanja Slavković, MD, PhD

Prof. Aleksandar Pavlović, MD, PhD

Prof. Milica Mijović, MD, PhD

Prof. Dobrila Stanković-Đorđević, MD, PhD

Prof. Predrag Đurđević, MD, PhD

Prof. Svetlana Radević, MD, PhD

Prof. Slobodanka Mitrović, MD, PhD

Prof. Zoran Bukumirić, MD, PhD

Res. Prof. Saša Radovanović, MD, PhD

Prof. Aleksandra Ilić, MD, PhD

Asst. Prof. Mlađan Golubović, MD, PhD

Asst. Prof. Marija Zdravković, MD, PhD

Asst. Prof. Marija Milić, MD, PhD

Asst. Prof. Vojin Kovačević, MD, PhD

Asst. Prof. Dejana Ružić Zečević, MD, PhD

Asst. Prof. Jagoš Golubović, MD, PhD

Asst. Prof. Darko Laketić, MD, PhD

Asst. Prof. Jelena Milenković, MD, PhD

Asst. Prof. Mihailo Stjepanović, MD, PhD

Res. Assoc. Irina Maslovarić, MD, PhD

TA Aleksandra Radovanović Spurnić, MD, PhD

TA Kristina Davidović, MD

TA Igor Spurnić, MD

TA Tomi Kovačević, MD, PhD

TA Andrej Preveden, MD

Internacionalni članovi

Prof. dr Marija Vavlukis
Prof. dr Oleg Lozan
Prof. dr Natalya Glushkova
Prof. dr Marius Ungureanu
Prof. dr Mihajlo (Michael) Jakovljević
Prof. dr Kalina Grivcheva Stardelova
Prof. dr Artem N. Kuzovlev
Prof. dr Zoran Ivanović
Doc. dr Srđan Mašić
Doc. dr Sasa Rajšić
Dr sci. med. Jelena Jeličić

International members

Prof. Marija Vavlukis, MD, PhD
Prof. Oleg Lozan, MD, MPH, PhD
Prof. Natalya Glushkova, MD, PhD
Prof. Marius Ungureanu, MD, PhD, MHA
Prof. Mihajlo (Michael) Jakovljevic, MD, PhD, MAE
Prof. Kalina Grivcheva Stardelova, MD, PhD
Prof. Artem N. Kuzovlev, MD, PhD
Prof. Zoran Ivanovic, MD, PhD
Asst. Prof. Srdjan Masic, MBI, MPH, PhD
Asst. Prof. Sasa Rajsic, MD, PhD
Jelena Jelacic, MD, PhD

ADRESA UREDNIŠTVA

Trg Nikole Pašića 7
11000 Beograd, Srbija
Telefoni:
(+381 11) 362 6196; (+381 11) 362 6197;
(+381 11) 362 6198; Fax: (+381 11) 362 6199
Elektronska adresa: info@smj.rs
Internet sajt: <https://smj.rs>

Časopis izlazi 4 puta godišnje

EDITORIAL OFFICE

7 Nikola Pašić Square
11000 Belgrade, Serbia
Telephone:
(+381 11) 362 6196; (+381 11) 362 6197;
(+381 11) 362 6198; Fax: (+381 11) 362 6199
E-mail: info@smj.rs
Website: <https://smj.rs>

The Journal is published quarterly

EDITORIJAL



„Krenite korak po korak. Ne morate videti čitavo stubište. Samo napravite prvi korak.“

Martin Luter King

Uvažene kolegice i kolege,

Veliko mi je zadovoljstvo i još veća čast da vam se obratim ovim uvodnikom i predstavim poslednji broj Srpskog medicinskog časopisa Lekarske komore Srbije za 2024. godinu.

Naš Časopis izlazi pune četiri godine, u toku kojih smo prolazili različite izazove. Oni su nekada bili veoma komplikovani i teški, dodatno usložnjeni specifičnim društveno-zdravstvenim prilikama u Srbiji i u svetu. Mi smo ih uspešno savladali i iz njih izašli dodatno jači i ponosniji.

Naime, prošlu, 2023. godinu, ispratili smo sa dostignućem u kategorizaciji, kao nacionalni naučni časopis koji se prvi put kategoriše, a ovu, 2024. godinu, ispraćamo i u Novu 2025. godinu ulazimo kao nacionalni časopis kategorije M53.

Ponosni smo na naš zajednički rad i činjenicu da svaki novi broj Časopisa prevazilazi po kvalitetu, sadržaju i formi, onaj prethodni. Verujemo da ćemo i tokom sledeće godine pratiti ovaj trend, i zajednički uspeti da napredujemo na našem putu razvoja Časopisa i njegove stručno-naučne validnosti.

I u ovom broju, Časopis donosi atraktivne teme koje će nam nesumnjivo biti od velike koristi u našem budućem svakodnevnom radu.

Timski rad je važan instrument organizacionog razvoja i upravljanja kvalitetom u različitim medicinskim disciplinama, pogovoto ukoliko se radi o lečenju ili rehabilitaciji kompleksnih i teških bolesnika. Veoma je važno da se utvrdi stepen zadovoljstva unutar tima ali i faktori koji doprinose izgradnji timskog rada i performansama tima, u smislu veće delotvornosti i manjeg odsustvovanja sa posla (apsentizam). Originalni rad dr Danijele Baščarević i saradnika pruža nam uvid u rezultate istraživanja sprovedenog u Specijalnoj bolnici za cerebralnu paralizu i razvojnu neurologiju u Beogradu. Pomoću upitnika, ispitivane su karakteristike timova koje su se odnosile na prosečni broj članova u timu, polnu strukturu, dužinu staža i 11 dimenzija timskog rada (svrha, zadovoljstvo, interakcije, obuke, komunikacije, procesi, i slično) kao i performanse multidisciplinarnih timova. Pokazatelji performansi, kao što su delotvornost (broj pacijenata po timu) i apsentizam (broj dana odsustvovanja sa posla), preuzeti su iz izveštaja službe za 2020. godinu.

Dr Lidija Šćepanović i Zoran Vujošević nam u svom originalnom radu prikazuju obezbeđenost i dinamiku kretanja broja medicinskih sestara/tehničara i njihovu strukturu, u desetogodišnjem periodu (2014–2023), u Crnoj Gori, kao i pozitivne promene u ujednačenosti distribucije medicinskih sestara/tehničara naspram broja stanovnika po opštinama u odnosu na raniji period.

EDITORIAL

"Take the first step in faith. You don't have to see the whole staircase, just take the first step."

Martin Luther King

Dear colleagues and friends,

It is my great pleasure and even greater honor to address you with this editorial and present the final issue of the Serbian Journal of the Medical Chamber for the year 2024.

Our Journal has been in publication for four years, during which time we have faced various challenges. Sometimes these challenges were very complex and difficult and additionally complicated by unique social and health conditions in Serbia and the world. We have successfully overcome them becoming even stronger and prouder.

Namely, we concluded the year 2023 with an achievement in categorization as a national scientific journal categorized for the first time, while we leave the year 2024 and welcome the New Year 2025 as a national journal with an M53 categorization.

We are proud of our joint effort and the fact that each new issue of the Journal surpasses the previous one in terms of quality, content and form. We believe that we will continue to follow this trend in the next year, and together we will succeed on our path of developing the Journal and its professional and scientific validity.

Just like previous issues, this issue of the Journal also presents engaging topics that will undoubtedly be of great use to us in our future everyday work.

Teamwork is an important instrument of organizational development and quality management in various medical disciplines, especially when it comes to the treatment or rehabilitation of patients with complex and difficult conditions. It is very important to determine the level of satisfaction within the team, as well as the factors that contribute to building teamwork and team performance, in terms of greater effectiveness and lesser absence from work (absenteeism). The original article written by Dr. Danijela Baščarević et al. provides us with an insight into the results of a survey conducted at the Special Hospital for Cerebral Palsy and Developmental Neurology in Belgrade. With the use of a questionnaire, the characteristics of the teams related to the average number of team members, gender structure, length of service and 11 dimensions of teamwork (purpose, satisfaction, interactions, training, communication, processes, etc.) as well as the performance of multidisciplinary teams, were examined. Performance indicators, such as effectiveness (number of patients per team) and absenteeism (number of days of absence from work), were taken from the annual operation report for 2020.

Originalni rad dr Lejle Imamović Lerić i dr Indire Husić obrađuje danas veoma aktuelnu temu, s obzirom na to da su društvene mreže zastupljene u svakodnevnom životu skoro svakog pojedinca. Autori su pokazali da postoji značajna veza između narcisoidnog poremećaja ličnosti i prisustva na društvenim mrežama.

Oralno zdravlje predstavlja segment u sklopu opšteg zdravlja čoveka i doprinosi celokupnom fizičkom, psihičkom i socijalnom blagostanju, omogućavajući osobama da jedu, komuniciraju i učestvuju u društvenom životu bez neprijatnosti, neugodnosti ili stresa. Originalni rad „Dostupnost preventivnih stomatoloških usluga predškolskoj i školskoj deci u javnim ustanovama na području Kantona Sarajevo“, autorke dr Amele Brčkalije i saradnika, pokazuje da je obezbeđena kvalitetna i sigurna preventivna stomatološka nega za predškolsku i školsku decu u javnom zdravstvenom sektoru.

Dr Dejan Munjiza i saradnici, u svom originalnom naučnom radu „Ejekciona frakcija leve komore i anteroposteriorni dijametar leve pretkomore kao prediktori ishoda akutnog ishemijskog moždanog udara“ su dokazali hipotezu da je uvećanje leve pretkomore iskazano porastom anteroposteriornog dijalmetra kao i pad sistolne funkcije leve komore, posmatran vrednošću ejekcione frakcije, prediktor lošeg ishoda kod ovih bolesnika.

Metakognicija, sposobnost refleksije i regulacije sopstvenih kognitivnih procesa, igra ključnu ulogu u medicinskom obrazovanju kroz unapređenje kritičkog mišljenja, poboljšanje kliničkog rasuđivanja, smanjenje dijagnostičkih grešaka i podsticanje prakse promišljanja. Procena metakognitivne svesnosti je od suštinskog značaja za studente univerziteta, jer utiče na njihovu sposobnost upravljanja učenjem i postizanja akademskog uspeha. Dr Zoran Bukumirić i saradnici, prikazuju rezultate studije koja je imala za cilj da proceni psihometrijske karakteristike srpske verzije Upitnika za procenu metakognitivne svesnosti, s fokusom na njenu konstruktivnu validnost i internu konzistentnost, odnosno pružaju dokaze o odgovarajućim metričkim svojstvima srpske verzije upitnika.

I u ovom broju prikazujemo nekoliko zanimljivih i veoma poučnih prikaza slučajeva.

Dr Dolika Vasović i saradnici predstavljaju slučaj pacijentkinje starosti 57 godina, koja je razvila okularne neželjene efekte osam meseci nakon početka primene terapije MEK/BRAF inhibitorima, što naglašava potrebu za ranom identifikacijom i lečenjem okularnih neželjenih efekata.

Zatim, dr Luka Pejnović i saradnici prikazuju slučaj pacijenta sa penoskotalnom Pagetovom bolešću, koja je veoma retka u svetu i za većinu lekara predstavlja veliku dilemu i u dijagnostici i u lečenju. Preoperativna dijagnoza i pravilan hirurški tretman predstavljaju adekvatno lečenje kojim se izbegavaju pojava recidiva i ponovljene operacije, što je svakako ključni faktor u preživljavanju.

Na kraju, dr Sveto Pantović i saradnici razmatraju danas dostupne preporuke za tretman vaginalne everzije i prikazuju slučaj pacijentkinje kod koje je učinjeno hirurško lečenje everzije vagine nakon histerektomije, koje obuhvata prednju kolpoplastiku u kombinaciji sa bilateralnom fiksacijom sakroskralnog ligamenta. Ovakvo lečenje se savetuje kod uznapredovale faze složenih vaginalnih everzija. Hirurška tehnika koja je primenjena kod pacijentkinje je efikasna i sigurna metoda lečenja. Ovo iskustvo je veoma značajno za mnoge naše kolege kod lečenja pacijentkinja sa ovakvim stanjem.

Preostaje mi još da vam poželim srećnu i uspešnu Novu 2025. godinu na ličnom i profesionalnom planu, sa željom da u njoj zajedno postignemo još veće i bolje rezultate.

S poštovanjem,

Kl. ass. dr sci. med. Aleksandra Radovanović Spurnić

Sekretar Srpskog medicinskog časopisa Lekarske komore

In their original article, Dr. Lidija Šćepanović and Zoran Vujošević present the provision and dynamics of the number of nurses/technicians and their structure, in Montenegro, over a period of ten years (2014–2023), as well as positive changes in the equity of the distribution of nurses/technicians in relation to the number of inhabitants across municipalities, as compared to the previous period.

The original article written by Dr. Lejla Imamović Lerić and Dr. Indira Husić deals with a very current topic, given that social media networks are present in the daily life of almost every individual today. The authors demonstrated a significant association between narcissistic personality disorder and social media presence.

Oral health is a segment of general human health that contributes to overall physical, mental and social well-being, enabling people to eat, communicate and participate in social life without discomfort, inconvenience or stress. The original article "Availability of preventive dental services to preschool and school children within the public health sector in the Canton of Sarajevo", written by Dr. Amela Brčkalija et al., shows that quality and safe preventive dental care is ensured for preschool and school children in the public health sector.

Dr. Dejan Munjiza et al., in their original scientific article "The left ventricular ejection fraction and the left atrial anteroposterior diameter as predictors of acute ischemic stroke outcome", proved the hypothesis that the enlargement of the left atrium, expressed by the increase in the anteroposterior diameter and the decrease in the systolic function of the left ventricle, as observed by the value of the ejection fraction, predict a bad outcome in these patients.

Metacognition, the ability to reflect and regulate one's own cognitive processes, plays a key role in medical education by improving critical thinking, improving clinical judgment, reducing diagnostic errors, and encouraging reflective practice. Assessment of metacognitive awareness is essential for university students, as it affects their ability to manage learning and achieve academic success. Dr. Zoran Bukumirić et al. present the results of a study that aimed to evaluate the psychometric characteristics of the Serbian version of the Metacognitive Awareness Inventory (MAI), focusing on its construct validity and internal consistency, they provide evidence of the appropriate metric characteristics of the Serbian version of the MAI questionnaire.

As always, in this issue we also present several interesting and very instructive case reports.

Dr. Dolika Vasović et al. present the case of a 57-year-old female patient who developed ocular side effects eight months after starting treatment with MEK/BRAF inhibitors, thus emphasizing the need for early identification and treatment of ocular side effects.

Next, Dr. Luka Pejnović et al. present the case of a patient with penoscrotal Paget's disease, which is very rare worldwide and for most doctors it represents a big dilemma in both diagnosis and treatment. Preoperative diagnosis and proper surgical treatment are the adequate method for avoiding recurrence and repeated surgical procedures, which is certainly a key factor in survival.

Finally, Dr. Sveto Pantović et al. discuss the recommendations available today for the treatment of vaginal eversion and present the case of a patient who underwent surgical treatment of vaginal eversion after hysterectomy, which includes anterior colpoplasty in combination with bilateral fixation of the sacrospinal ligament. This type of treatment is advised in the advanced stage of complex vaginal eversions. The surgical technique applied to the patient is an effective and safe method of treatment. This experience is very important for many of our colleagues when treating patients with this condition.

It remains for me to wish you a happy and successful New Year 2025, both on a personal and professional level, with the hope of achieving even greater and better results together.

Sincerely,

TA Aleksandra Radovanović Spurnić, MD, PhD

Secretary of the Serbian Journal of the Medical Chamber

SADRŽAJ

ORIGINALNI RADOVI

ORIGINAL ARTICLES

- Danijela Baščarević, Slaviša Baščarević, Sanja Dimitrijević, Jovana Marković, Stanislava Milošević*
ZNAČAJ TIMSKOG RADA ZA UNAPREĐENJE KVALITETA U MEDICINSKOJ REHABILITACIJI
THE IMPORTANCE OF TEAMWORK FOR QUALITY IMPROVEMENT IN MEDICAL REHABILITATION 487
- Lidija Šćepanović, Zoran Vujošević*
POZITIVNI TREND OVI KRETANJA BROJA MEDICINSKIH SESTARA I TEHNIČARA U CRNOJ GORI:
PREGLED PERIODA OD 2014. DO 2023. GODINE
POSITIVE TRENDS IN THE NUMBER OF NURSES AND TECHNICIANS IN MONTENEGRO:
AN OVERVIEW OF 2014–2023 501
- Lejla Imamović Lerić, Indira Husić*
POVEZANOST NARCISOIDNOG POREMEĆAJA LIČNOSTI I UPOTREBE DRUŠTVENIH MREŽA
EXPLORING THE ASSOCIATION BETWEEN NARCISSISTIC PERSONALITY
DISORDER AND SOCIAL MEDIA USE 512
- Amela Brčkalija, Amer Ovčina, Aida Ramić-Čatak, Zarema Obradović, Šeila Cilović-Lagarija, Adis Hrvaić, Maja Pločo*
DOSTUPNOST PREVENTIVNIH STOMATOLOŠKIH USLUGA PREDŠKOLSKOJ I ŠKOLSKOJ DECI
U JAVNIM USTANOVAMA NA PODRUČJU KANTONA SARAJEVO
AVAILABILITY OF PREVENTIVE DENTAL SERVICES TO PRESCHOOL AND
SCHOOL CHILDREN WITHIN THE PUBLIC HEALTH SECTOR IN THE CANTON OF SARAJEVO 523
- Dejan Munjiza, Biljana Georgievski-Brkić, Filip Vitošević, Marjana Vukićević*
EJEKCIJA FRAKCIJA LEVE KOMORE I ANTEROPOSTERIORNI DIJAMETAR LEVE
PRETKOMORE KAO PREDIKTORI ISHODA AKUTNOG ISHEMIJSKOG MOŽDANOG UDARA
THE LEFT VENTRICULAR EJECTION FRACTION AND THE LEFT
ATRIAL ANTEROPOSTERIOR DIAMETER AS PREDICTORS OF ACUTE ISCHEMIC STROKE OUTCOME 536
- Zoran Bukumirić, Dejana Stanisavljević, Nataša Milić, Anđela Ćirković, Jelena Milin-Lazović, Marko Savić, Nina Rajović, Aleksandar Ćorac, Jelena Jović, Aleksandra Ilić, Mirjana Pajčin, Snežana Mugoša, Mirjana Nedović Vuković, Borko Bajić, Igor Sladojević, Srđan Mašić, Dragan Spaić, Dejan Bokonjić*
PROCENA PSIOMETRIJSKIH KARAKTERISTIKA SRPSKE VERZIJE UPITNIKA
ZA PROCENU METAKOGNITIVNE SVESNOSTI
ASSESSING PSYCHOMETRIC PROPERTIES OF THE SERBIAN VERSION OF
THE METACOGNITIVE AWARENESS INVENTORY (MAI) 543

CONTENTS

PRIKAZI SLUČAJEVA

CASE REPORTS

<i>Dolika D. Vasović, Dejan M. Rašić, Ivan Marjanović, Tanja Kalezić, Margita Lučić</i> REVERZIBILNI OČNI NEŽELJENI EFEKTI U TRETMANU MELANOMA MEK/BRAF INHIBITORIMA REVERSIBLE OCULAR ADVERSE EFFECTS IN MELANOMA TREATMENT WITH MEK/BRAF INHIBITORS	555
<i>Luka Pejnović, Igor Đurišić, Ognjen Živković, Ognjen Petrović, Ivana Petrović, Zorka Inić, Ivan Marković</i> PENOSKROTALNA PAGETOVA BOLEST – PRIKAZ SLUČAJA I PREGLED LITERATURE PENOSCROTAL PAGET'S DISEASE – CASE REPORT AND LITERATURE REVIEW	561
<i>Sveto Pantović, Jelena Dotlić, Katarina Stefanović, Branislav Milošević, Kosta Pantović, Ivana Likić Lađević</i> HIRURŠKO LEČENJE EVERZIJE VAGINE NAKON HISTEREKTOMIJE – PRIKAZ SLUČAJA I PREGLED LITERATURE INDIVIDUALIZED TREATMENT FOR POSTHYSTERECTOMY VAGINAL EVERSION – CASE REPORT AND LITERATURE REVIEW	567

UPUTSTVO AUTORIMA

INSTRUCTIONS FOR AUTHORS

GODIŠNJI SPISAK RECENZENATA ZA 2024. GODINU ANNUAL LIST OF REVIEWERS FOR 2024	574
--	-----

THE IMPORTANCE OF TEAMWORK FOR QUALITY IMPROVEMENT IN MEDICAL REHABILITATION

Danijela Baščarević¹, Slaviša Baščarević², Sanja Dimitrijević¹, Jovana Marković¹, Stanislava Milošević¹

¹ Specijalna bolnica za cerebralnu paralizu i razvojnu neurologiju, Beograd, Srbija

² Univerzitet u Beogradu, Medicinski fakultet, Klinika za grudnu hirurgiju, Beograd, Srbija

¹ Special Hospital for Cerebral Palsy and Developmental Neurology, Belgrade, Serbia

² University of Belgrade, Faculty of Medicine, Clinic for Thoracic Surgery, Belgrade, Serbia

SAŽETAK

Uvod: Timski rad je važan instrument organizacionog razvoja i upravljanja kvalitetom. U medicinskoj rehabilitaciji, multidisciplinarni timovi su neophodnost. Rezultati analize sastava i funkcionisanja tima sačinjenog od profesionalca različitih disciplina, kao i samog timskog rada, doprinose sagledavanju složenih procesa rada, uklonjenosti uloga i aktivnosti članova tima, kao i optimizaciji performansi tima, kao krajnjoj svrsi.

Cilj rada je da se utvrdi stepen zadovoljstva unutar tima, ali i faktori koji doprinose izgradnji timskog rada i boljim performansama tima, u smislu veće delotvornosti i manjeg odsustvovanja sa posla (apsentizam).

Materijali i metode: Istraživanje je sprovedeno u Specijalnoj bolnici za cerebralnu paralizu i razvojnu neurologiju u Beogradu, tokom januara 2021. godine. Studijom preseka analizirane su karakteristike i performanse multidisciplinarnih timova zdravstvenih radnika i saradnika, koji su funkcionalno raspoređeni u četiri organizacione jedinice. Timovi su anonimno popunjavali specijalno konstruisan upitnik. Ispitivane karakteristike timova su se odnosile na prosečan broj članova u timu, polnu strukturu, dužinu staža i 11 dimenzija timskog rada (svrha, zadovoljstvo, interakcije, obuke, komunikacije, procesi i slično). Pokazatelji performansi kao što su delotvornost (broj pacijenata po timu) i apsentizam (broj dana odsustvovanja sa posla) su preuzeti iz izveštaja službe za 2020. godinu.

Rezultati: Stepem zadovoljstva u odnosu na pripadnost organizacionoj jedinici, kako prema ukupnoj skali, tako i prema sve četiri podskale, jeste najviši kod zaposlenih u Stacionarnoj „B“ organizacionoj jedinici. Visoko zadovoljstvo timskim radom kod statistički preovlađujućeg broja ispitanika rezultat je zadovoljstva načinom upravljanja timom (91,7%), funkcionisanjem u timu (88,1%), organizacionom kulturom (79,8%) i kulturom u timu (60,5%). Potvrđeno je da bolje izgrađen tim postiže bolje performanse, u smislu veće produktivnosti i smanjenja apsentizma.

Zaključak: Rezultati istraživanja ukazuju na potrebne korekcije koje menadžment treba da sprovede u organizaciji timskog rada, kako bi se ostvarilo izraženije zadovoljstvo svih ispitanika timskim radom i u većoj meri ostvarile željene performanse.

Ključne reči: timski rad, medicinska rehabilitacija, menadžment, organizacija timskog rada

ABSTRACT

Introduction: Teamwork is an important instrument of organizational development and quality management. In medical rehabilitation, multidisciplinary teams are a necessity. The results of the analysis of the composition and functioning of a team made up of professionals from different disciplines, as well as of teamwork itself, contribute to the understanding of complex work processes, the integration of roles and activities of team members, and the optimization of team performance, as the ultimate goal.

The study aims to determine the level of satisfaction within the team and the factors that contribute to building teamwork and better team performance, in terms of greater effectiveness and a decline in absenteeism.

Materials and methods: This cross-sectional study was conducted at the Special Hospital for Cerebral Palsy and Developmental Neurology in Belgrade, in January 2021. It analyzed the characteristics and performance of multidisciplinary teams of health workers and other professionals, functionally distributed in four organizational units. The teams anonymously filled out a specially designed questionnaire. The analyzed characteristics of the teams related to the average number of members in the team, gender structure, length of service, and 11 dimensions of teamwork (purpose, satisfaction, interactions, training, communication, processes, etc.). Performance indicators such as effectiveness (number of patients per team) and absenteeism (number of days of absence from work) were taken from the annual operation report for 2020.

Results: The level of satisfaction in terms of belonging to the organizational unit, according to the total scale and all four subscales, was highest among employees in the "B" Infirmary Unit. A statistically predominant number of respondents showed high satisfaction with teamwork, which was the result of satisfaction with team management (91.7%), the functioning of the team (88.1%), the organizational culture (79.8%), and team culture (60.5%). It has been confirmed that a better-structured team achieves better performance, in terms of higher productivity and a decline in absenteeism.

Conclusion: The study results indicate the necessary improvements that management should implement in organizing teamwork in order to achieve a higher level of satisfaction with teamwork in all respondents and better performance.

Keywords: teamwork, medical rehabilitation, management, teamwork organization

Autor za korespondenciju:

Danijela Baščarević

Specijalna bolnica za cerebralnu paralizu i razvojnu neurologiju

Sokobanjska 17a, 11000 Beograd, Srbija

Elektronska adresa: bascarevicd@yahoo.com

Corresponding author:

Danijela Baščarević

Special Hospital for Cerebral Palsy and Developmental Neurology

17a Sokobanjska Street, 11000 Belgrade, Serbia

E-mail: bascarevicd@yahoo.com

Primljeno • Received: July 6, 2024;

Revidirano • Revised: July 30, 2024;

Prihvaćeno • Accepted: August 19, 2024;

Online first: December 25, 2024

DOI: 10.5937/smclks-52025

UVOD

Holistički orijentisana medicinska rehabilitacija počiva na temeljima timskog rada jer je rehabilitovanje aktivnosti i podizanje kvaliteta života osoba sa akutnim/hroničnim zdravstvenim problemom nemoguće ostvariti kroz delovanje samo jedne profesije [1]. Za postizanje optimalnih ishoda medicinske rehabilitacije neophodno je objediniti zdravstvene radnike (lekare različitih specijalnosti) ali i saradnike kao što su logopedi, psiholozi, defektolozi, fizikalni i okupacioni terapeuti, socijalni radnici, te medicinske sestre. U literaturi, nedostaju dokazi o ključnim komponentama uspešnih timova u programima fizikalne i rehabilitacione medicine [2].

Timski rad i njegova efikasnost u zdravstvenoj zaštiti predstavlja nezaobilazan činilac u organizaciji kvaliteta rukovođenja što ima direktan uticaj na podizanje kvaliteta lečenja i rehabilitacije. Takođe, timski oblik organizovanja rada pruža članovima tima osećaj koherentnosti i pripadnosti [3]. Sa druge strane, nedostatak timske saradnje i komunikacije može da poveća nepotrebnog antagonizam među zdravstvenim radnicima i da doprinese dugotrajnom apsentizmu. Nekoliko studija je pokazalo da je zadovoljstvo zaposlenih u rehabilitacionim ustanovama u kojima rukovodioci podržavaju efikasan timski rad veće [3-5]. Teorija o odnosu timskog rada i učinka u zdravstvenim timovima se nalazi u osnovi konceptualizacije ovog istraživanja [6]. Ova teorija objašnjava da se u medicinskoj rehabilitaciji izgradnjom timskog rada mogu postići bolje performanse. U skladu sa teorijskim okvirom, potrebno je ispitivati subjektivni doživljaj timskog rada uporedo sa objektivnim pokazateljima timskog rada kako bi se smanjile sistemske greške (engl. *bias*) u zaključivanju, i validirao model unapređenja timskog rada [7,8].

Ciljevi ovog istraživanja su da se analizom karakteristika timskog rada utvrdi povezanost između stepena zadovoljstva u timu i pokazatelja performansi tima. Polazne hipoteze rada su sledeće:

1. Tim sa zadovoljnijim članovima ostvaruje veću delotvornost;
2. Tim sa zadovoljnijim članovima beleži manji apsentizam.

MATERIJALI I METODE

U pitanju je studija preseka sa deskriptivno-analitičkim pristupom opisivanju karakteristika timskog rada na medicinskoj rehabilitaciji osoba sa invaliditetom i utvrđivanju povezanosti između zadovoljstva u timu i odabranih pokazatelja performansi tima, u Specijalnoj bolnici za cerebralnu paralizu i razvojnu neurologiju, u Beogradu, tokom januara 2021. godine.

Ispitivanu populaciju su činili zdravstveni radnici (lekari, medicinske sestre) i zdravstveni saradnici (fizi-

INTRODUCTION

Holistically oriented medical rehabilitation rests on the foundations of teamwork because rehabilitating activity in patients with acute/chronic health problems and improving their quality of life is impossible to achieve through the work of only one profession [1]. Achieving optimal results in medical rehabilitation requires the collaboration of health workers (doctors of various specialties) and other professionals, such as speech therapists, psychologists, defectologists, physical and occupational therapists, social workers, and nurses. The literature lacks evidence on the key components of successful teams in physical and rehabilitation medicine programs [2].

Teamwork and its effectiveness in health care are key factors in organizing quality management, directly impacting the improvement of the quality of treatment and rehabilitation. Also, organizing work in the form of a team effort provides members with a sense of coherence and belonging [3]. On the other hand, a lack of team cooperation and communication can increase unnecessary antagonism among healthcare workers and contribute to long-term absenteeism. Several studies have shown that employee satisfaction in rehabilitation facilities where managers support effective teamwork is higher [3-5]. The theory of the relationship between teamwork and performance in healthcare teams is at the core of the conceptualization of this study [6]. This theory explains that better performance can be achieved in medical rehabilitation by building teamwork. In accordance with the theoretical framework, it is necessary to examine the subjective experience of teamwork together with objective indicators of teamwork in order to reduce bias when drawing conclusions and validate the model of teamwork improvement [7,8].

This study aims to determine the relationship between the degree of satisfaction in the team and indicators of team performance by analyzing the characteristics of teamwork. The starting hypotheses of the study are as follows:

1. A team with more satisfied members achieves greater effectiveness;
2. A team with more satisfied members records lower absenteeism.

MATERIALS AND METHODS

This is a cross-sectional study with a descriptive and analytical approach to depicting the characteristics of teamwork in the medical rehabilitation of persons with disabilities and determining the connection between satisfaction in the team and selected indicators of team performance, carried out at the Special Hospital for Cerebral Palsy and Developmental Neurology in Belgrade, in January 2021.

oterapeuti i radni terapeuti, defektolozi, logopedi, psiholozi, socijalni radnici) u četiri organizacione jedinice: Ambulantno poliklinička služba (APS), Stacionarno „A“ odeljenje (SAO), Stacionarno „B“ odeljenje (SBO) i Dnevna bolnica (DB). U istraživanje su uključena 124 radnika Specijalne bolnice za cerebralnu paralizu i razvojnu neurologiju u Beogradu kojima su dati upitnici za popunjavanje. Od podeljenih 124 upitnika, 109 (87,9%) je validno popunjeno, dva (1,6%) su vraćena nepopunjena, dok 7 (5,6%) upitnika nije vraćeno.

Izvori podataka za istraživanje su bili anketa i rutinski godišnji izveštaji o radu službi. U anketi je, kao instrument istraživanja korišćen upitnik koji su članovi tima samostalno popunjavali. Učešće u istraživanju je bilo dobrovoljno. Vodeći se teorijom o odnosu timskog rada i učinka [6] i sličnim istraživanjima [9-13], konstruisan je upitnik od dva dela. Prvi deo upitnika se odnosio na individualna obeležja ispitanika (demografske karakteristike i dužina radnog staža), a drugi je sadržao četiri grupe pitanja koja su se odnosila na organizacione aspekte timskog rada. Za procenu timskog rada, ispitivana je percepcija, odnosno subjektivni doživljaj timskog rada – ocena zadovoljstva na kontinualnoj skali 0-100 (Tabela 1), a u odnosu na 22 tvrdnje koje su tako grupisane da opišu sledeća četiri aspekta: upravljanje timom, kultura u timu, organizacija timskog rada i funkcionisanje u timu:

- ♦ *Upravljanje timom* (podskala od šest pitanja o procesima upravljanja, svrsi tima, usklađenosti timova i raspoređivanju resursa). Sabiranjem ostvarenih bodova formirana je podskala za stepen zadovoljstva upravljanjem timom (U – upravljanje);
- ♦ *Kultura u timu* (podskala od šest pitanja o intertimskim interakcijama, integraciji tima i timskom radu). Sabiranjem ostvarenih bodova formirana je podskala za stepen zadovoljstva kulturom u timu (K – kultura);
- ♦ *Organizacija timskog rada* (podskala od šest pitanja o sistemskim elementima organizacije rada, povratnim informacijama, priznanjima, dostupnosti informacija i dostupnosti obuke). Sabiranjem ostvarenih bodova formirana je podskala za stepen zadovoljstva organizacionim sistemom (O – organizacija);
- ♦ *Funkcionisanje u timu* (podskala od četiri pitanja o pripadnosti timu i timskim procesima). Sabiranjem ostvarenih bodova formirana je podskala za funkcionisanje u timu (F – funkcionisanje).

Pouzdanost i valjanost primenjene skale i njenih podskala utvrđivane su Kronbah alfa koeficijentom (engl. *Cronbach's alpha reliability coefficient*), koji je za skalu u celini bio 0,964, za podskalu *Upravljanje timom* je iznosio 0,867, za podskalu *Kultura u timu* je bio 0,922, za podskalu *Organizacija timskog rada* je iznosio 0,908,

The study population comprised healthcare workers (doctors, nurses) and professionals collaborating with healthcare workers (physical therapists, occupational therapists, defectologists, speech therapists, psychologists, and social workers) in four organizational units: the Outpatient Polyclinic (OP), the “A” Infirmary Unit (AIU), the “B” Infirmary Unit (BIU) and the Day Hospital (DH). In total, 124 employees of the Special Hospital for Cerebral Palsy and Developmental Neurology in Belgrade were included in the study and given questionnaires to fill out. Of the 124 distributed questionnaires, 109 (87.9%) were filled out properly, two (1.6%) were turned in blank, while 7 (5.6%) questionnaires were not turned in.

A survey and routine annual reports on the operation of the organizational units were used as data sources for the study. The survey used a questionnaire as a research instrument, which the team members filled out independently. Participation in the study was voluntary. The two-part questionnaire was constructed guided by the theory on the relationship between teamwork and performance [6] and similar studies [9-13]. The first part of the questionnaire related to the individual characteristics of the respondents (demographic characteristics and length of service), while the second part contained four groups of questions related to the organizational aspects of teamwork. To assess teamwork, the perception, i.e., the subjective experience of teamwork was examined – satisfaction rating on a continuous scale of 0-100 (Table 1), concerning 22 statements that were grouped to describe the following four aspects: team management, team culture, teamwork organization, and team functioning:

- ♦ *Team Management* (a subscale comprising six questions on management processes, team purpose, team cohesion, and resource allocation). The subscale for the degree of satisfaction with team management (M – management) was formed based on the sum of the resulting scores;
- ♦ *Team Culture* (a subscale comprising six questions on inter-team interactions, team integration, and teamwork). The subscale for the degree of satisfaction with team culture (C – culture) was formed based on the sum of the resulting scores;
- ♦ *Teamwork Organization* (a subscale comprising six questions on the systemic elements of work organization, feedback, recognition, information availability, and the availability of training). The subscale for the degree of satisfaction with the organizational system (O – organization) was formed based on the sum of the resulting scores;
- ♦ *Team Functioning* (a subscale comprising four questions about belonging to a team and team

dok je za podskalu *Funkcionisanje u timu* njegova vrednost bila 0,877. S obzirom na to da su vrednosti koeficijenta vrlo visoke, a najviše za skalu u celini, može se reći da su skala kao i podskale definisane na osnovu upitnika veoma pouzdane.

Izabrani pokazatelji performansi kvaliteta timskog rada u medicinskoj rehabilitaciji – delotvornost (broj pacijenata po timu) i apsentizam (broj dana odsustvovanja sa posla) su preuzeti iz izveštaja službe za 2020. godinu. Godišnji prosečni apsentizam po radniku je izračunat po sledećoj formuli:

$$\text{Aps} = \frac{\text{izgubljeni radni dani u toku godine}}{\text{ukupan broj zaposlenih}} \times 100.$$

Za testiranje performansi u odnosu na binarnu varijablu koja odražava zadovoljstvo izgrađenim timom, gde je 1 – visok stepen zadovoljstva (veoma visoka, visoka i prosečna ocena zadovoljstva), a 0 – nizak stepen zadovoljstva (niska i veoma niska učestalost zadovoljstva), korišćene su granične vrednosti skale i skorova navedene u tabeli ispod.

Statistička obrada podataka urađena je u programu *SPSS 15.0*. Kontinualne varijable u istraživanju prikazane su pomoću srednjih vrednosti (aritmetička sredina – AS), standardne devijacije (SD), a kvalitativna obeležja pomoću apsolutnih brojeva, odnosno frekvencija (N) i procentualno (%). Poređenje učestalosti atributivnih parametara između grupa vršeno je Hi kvadratnim testom (engl. *Chi square test*). Poređenje ostvarenih skorova skale i podskala između različitih organizacionih jedinica sprovedeno je putem ANOVA analize, a između pojedinih podskala pomoću testova *post-hoc* analize. Statističke hipoteze su testirane na nivou statističke značajnosti (alfa nivo) od 0,05.

processes). The subscale for team functioning (F – functioning) was formed based on the sum of the resulting scores.

The reliability and validity of the applied scale and its subscales were determined with Cronbach's alpha reliability coefficient, which was 0.964 for the total scale, 0.867 for the *Team Management* subscale, 0.922 for the *Team Culture* subscale, 0.908 for the *Teamwork Organization* subscale, and 0.877 for the *Team Functioning* subscale. Given that the values of the coefficients are quite high, especially for the total scale, it can be said that the scale and the subscales defined based on the questionnaire are very reliable.

Selected performance indicators of teamwork quality in medical rehabilitation – effectiveness (number of patients per team) and absenteeism (number of days of absence from work) were taken from the annual report for 2020. Annual average absenteeism per employee was calculated according to the following formula:

$$\text{Abs} = \frac{\text{lost workdays during the year}}{\text{total number of employees}} \times 100.$$

Cut-off values of the scale and scores presented in the table below were used to test performance in relation to the binary variable that reflects satisfaction with the team, with 1 marking a high degree of satisfaction (very high, high, and average satisfaction ranking) and 0 marking a low degree of satisfaction (low and very low frequency of satisfaction).

SPSS 15.0 was used for statistical data processing. Continuous variables in the study are presented as mean values (arithmetic mean – AM) and the standard deviation (SD), while qualitative characteristics are presented as absolute numbers, i.e., frequencies (N) and percentages (%). The comparison of the frequency of

Tabela 1. Granične vrednosti skorova na ukupnoj skali i podskalama upitnika i konverzija u procene zadovoljstva izgrađenim timom

Stepen / Degree	Procena zadovoljstva izgrađenim timom / Assessment of satisfaction with the team	Cela skala (22 pitanja) / Total scale (22 questions)	Podskale Upravljanje timom, Kultura u timu i Organizacija timskog rada (šest pitanja) / Subscales Team Management, Team Culture, and Teamwork Organization (six questions)	Podskala Funkcionisanje u timu (četiri pitanja) / Subscale Team Functioning (four questions)
5	Veoma visoko / Very high	100 do/ to 110	28 do/ to 30	19 do/ to 20
4	Visoko / High	78 do/ to 99	22 do/ to 27	15 do/ to 18
3	Prosečno / Average	56 do/ to 77	16 do/ to 21	11 do/ to 14
2	Nisko / Low	34 do/ to 55	10 do/ to 15	7 do/ to 10
1	Veoma nisko / Very low	22 do/ to 33	6 do/ to 9	4 do/ to 6

Table 1. Cut-off values of scores in the total scale and the subscales of the questionnaire, and conversion into the assessment of satisfaction with the team

REZULTATI

U celom uzorku, kao i u svim radnim timovima, statistički su bili značajno zastupljeniji ispitanici ženskog pola ($p < 0,001$), (Tabela 2).

Distribucija zaposlenih po starosnim kategorijama je pokazala da je 82,6% zaposlenih bilo u kategoriji između 35 i 54 godine, manje od 35 godina je imalo 9,2% zaposlenih, dok je najmanje zaposlenih bilo starije od 55 godina, svega 8,3% (Tabela 3).

Tabela 2. Polna struktura radnih timova

Table 2. The gender structure of work teams

Radni tim (organizaciona jedinica) / Work team (organizational unit)	Pol / Gender			
	Muški / Male		Ženski / Female	
	n	%	n	%
SAO / AIU	3	12.5%	21	87.5%
SBO / BIU	0	0.0%	28	100.0%
APS / OP	5	15.6%	27	84.4%
DB / DH	4	16.0%	21	84.4%
Ukupno / Total	12	11.0%	97	89.0%

Tabela 3. Starosna struktura radnih timova

attributive parameters among groups was performed using the Chi-square test. The comparison of recorded scores on the scale and the subscales among different organizational units was performed with ANOVA analysis, while post-hoc analysis tests were used for the comparison among individual subscales. Statistical hypotheses were tested at a statistical significance level (alpha level) of 0.05.

RESULTS

In the entire sample, as well as in all work teams, there were statistically significantly more female respondents ($p < 0.001$), (Table 2).

The distribution of employees by age showed that 82.6% were in the 35 to 54 category, 9.2% were younger than 35 years, while the least number of employees were older than 55 years, only 8.3% (Table 3).

The distribution of employees in relation to the length of service (Table 4) shows that the highest number of employees in outpatient teams had longer service, i.e., more than 20 years (OP: 62.3%; DH: 84%), as compared to the inpatient units, where the highest number of employees had between 10 and 20 years of service (AIU: 58.3%; BIU: 67.9%). The Day Hospital

Table 3. The age structure of the work teams

Radni tim (organizaciona jedinica) / Work team (organizational unit)	Starost (godine) / Age (years)					
	Manje od 35 / Younger than 35		35 do 54 / 35 to 54		Više od 55 / Older than 55	
	n	%	n	%	n	%
SAO / AIU	3	12.5%	20	83.3%	1	4.2%
SBO / BIU	5	17.9%	23	82.1%	0	0.0%
APS / OP	1	3.1%	26	81.3%	5	15.6%
DB / DH	1	4.0%	21	84.0%	3	12.0%
Ukupno / Total	10	9.2%	90	82.6%	9	8.3%

Tabela 4. Struktura ispitanika u radnim timovima prema dužini radnog staža

Table 4. Structure of respondents in work teams according to length of service

Radni tim (organizaciona jedinica) / Work team (organizational unit)	Radni staž (godine) / Length of service (years)					
	Manje od 10 / Less than 10		10 do 20 / 10 to 20		Više od 20 / More than 20	
	n	%	n	%	n	%
SAO / AIU	4	16.7%	14	58.3%	6	25.0%
SBO / BIU	5	17.9%	19	67.9%	4	14.3%
APS / OP	2	62.3%	12	37.5%	18	56.3%
DB / DH	1	4.0%	3	12.0%	21	84.0%
Ukupno / Total	12	11.0%	48	44.0%	49	45.0%

Tabela 5. Broj lekara i pacijenata, godišnji broj pacijenata i godišnji apsentizam po zaposlenom

Radni tim (organizaciona jedinica) / Work team (organizational unit)	Broj lekara / Number of doctors	Broj pacijenata / Number of patients	Godišnji broj pacijenata po zaposlenom / Annual patient count per employee	Godišnji apsentizam po zaposlenom* / Annual absenteeism per employee*
SAO / AIU	3	1.810	603	56.2
SBO / BIU	3	1.932	644	60.0
APS / OP	8	5.472	684	58.8
DB / DH	3	2.183	728	64.6
Ukupno / Total	17	11.397	665	

Podaci su prikazani po učestalostima i procentualno.

*Godišnji apsentizam – izgubljeni radni dani u toku godine/ukupan broj zaposlenih $\times 100$

Distribucija zaposlenih u odnosu na dužinu radnog staža (Tabela 4), pokazala je da je u ambulantnim timovima najveći broj zaposlenih imao duži radni staž, odnosno više od 20 godina (APS: 62,3%; DB: 84%), u poređenju sa stacionarnim odeljenjima, gde je najveći broj zaposlenih imao između 10 i 20 godina radnog staža (SAO: 58,3%; SBO: 67,9%). U Dnevnoj bolnici, zaposleni su bili najopterećeniji jer su godišnje imali 728 pacijenata po zaposlenom. Tu je istovremeno bio i najveći godišnji apsentizam po zaposlenom od 64,6 dana. Najmanje vrednosti oba navedena parametra su registrovane na Stacionarnom „A“ odeljenju (Tabela 5).

Upravljanje timom

Više od pola ispitanika je bilo saglasno sa tvrdnjom da često dobijaju jasne instrukcije potrebne u svakodnevnom radu, da često imaju izraženu želju da rade na ostvarivanju zajedničkih ciljeva, i da su ciljevi tima usklađeni sa ciljevima ustanove (Tabela 6).

Kultura u timu

Samo se između jedne trećine i dve petine ispitanika najčešće slagalo sa tvrdnjama da koordinatori tima često ohrabruju članove tima da zajedno rade i razvijaju timski duh, da postoji pomoć vođe tima članovima tima da sagledaju uklapanje sopstvene uloge u šire funkcionisanje tima, da vođa tima u svom odnosu prema članovima tima pokazuje poštovanje, kao i da razume i vrednuje timski radi. Isti udeo ispitanika je veoma često smatrao da je njihov tim važan deo organizacije ustanove, ali i da ustanova članovima tima ponekad daje podršku u svakom pogledu (Tabela 7).

Organizacija timskog rada

Trećina ispitanika iskazala je da često dobija informacije o učinku tima u celini, ali da članovi tima *nikada* nisu na-

Table 5. Number of doctors and patients, annual patient count per employee, and annual absenteeism per employee

Data are presented by frequency and as percentages.

*Annual absenteeism – lost workdays during the year/total number of employees $\times 100$

employees had the greatest workload as they had 728 patients per employee annually. At the same time, this was where the highest annual absenteeism per employee was recorded, i.e., 64.6 days. The lowest values for both of the abovementioned parameters were registered in the “A” Infirmary Unit (Table 5).

Team Management

More than half of the respondents agreed with the statement that they frequently receive clear instructions necessary in their everyday work, that they frequently have a strong desire to work towards achieving common goals, and that the team goals are aligned with the goals of the hospital (Table 6).

Team Culture

Only between one-third and two-fifths of respondents most often agreed with the statements that team coordinators frequently encourage team members to work together and develop team spirit, that there is help provided by the team leader to team members so that they can understand how their role fits into the broader context of team functioning, that the team leader treats the members with respect, as well as that he/she understands and values teamwork. The same ratio of respondents very frequently considered their team to play an important part in the organizational structure of the hospital and felt that the hospital only sometimes provides support to team members in all aspects of their work (Table 7).

Teamwork Organization

A third of the respondents stated that they frequently receive information about team performance, but that the team members are *never* rewarded for a job well done, while two-fifths of the respondents stated

Tabela 6. Stepen slaganja ispitanika sa tvrdnjama o upravljanju timom**Table 6.** Degree of respondents' agreement with statements regarding team management

Tvrdnja / Statement	Nikad / Never		Retko / Rarely		Ponekad / Sometimes		Često / Frequently		Veoma često / Very frequently		Ukupno / Total	
	n	%	n	%	n	%	n	%	n	%	N	%
Članovi tima dobijaju jasne instrukcije potrebne u svakodnevnom radu. / Team members frequently receive clear instructions necessary in their everyday work.	0	0.0%	7	6.4%	24	22.0%	60	55.1%	18	16.5%	109	100%
Članovi tima žele da rade na ostvarivanju zajedničkih ciljeva. / Team members want to work towards achieving common goals.	0	0.0%	7	6.4%	21	19.3%	57	52.3%	24	22.0%	109	100%
Ciljevi tima su usklađeni sa ciljevima ustanove. / Team goals are aligned with the goals of the hospital.	2	1.8%	10	9.2%	21	19.3%	56	51.4%	20	18.4%	109	100%
Članovi tima razumeju kako njihov rad utiče na rad bolnice u celini. / Team members understand how their work affects the operation of the hospital as a whole.	3	2.7%	10	9.2%	21	19.3%	53	48.6%	22	20.2%	109	100%
Članovi tima dobijaju relevantne informacije od koordinatora tima. / Team members receive relevant information from team coordinators.	1	0.9%	10	9.2%	34	31.2%	43	39.4%	21	19.3%	109	100%
Tim ima dovoljno resursa da ostvari svoje ciljeve. / The team has sufficient resources to achieve its goals.	2	1.8%	20	8.4%	40	36.7%	33	30.3%	14	12.8%	109	100%

građeni za dobro obavljen posao, dok su dve petine ispitanika iskazale da često dobijaju potrebne informacije od vođe tima. Manje od trećine ispitanih je navelo da je obuka članovima tima samo *ponekad* dostupna, onda kada je to potrebno, ili navodi da se članovima tima *retko* pružaju prilike za dodatno usavršavanje (Tabela 8).

that they frequently receive the necessary information from the team leader. Less than a third of the respondents stated that training is only *sometimes* available to team members when needed, or stated that team members are *rarely* provided with additional training opportunities (Table 8).

Tabela 7. Stepen slaganja ispitanika sa tvrdnjama o kulturi u timu**Table 7.** Degree of respondents' agreement with statements regarding team culture

Tvrdnja / Statement	Nikad / Never		Retko / Rarely		Ponekad / Sometimes		Često / Frequently		Veoma često / Very frequently		Ukupno / Total	
	n	%	n	%	n	%	n	%	n	%	N	%
Članovi tima se ohrabruju da rade zajedno i razvijaju timski duh. / Team members are encouraged to work together and develop the team spirit.	10	9.2%	12	11.0%	27	24.8%	41	37.6%	19	17.4%	109	100%
Vođe tima pomažu članovima tima da sagledaju kako se njihove uloge uklapaju u šire funkcionisanje tima. / Team leaders help team members see how their roles fit into the broader context of team functioning.	10	9.2%	18	16.5%	27	24.8%	38	34.9%	16	14.7%	109	100%
Članovi tima imaju podršku od ustanove u svakom pogledu. / Team members are supported by the hospital in every aspect of their work.	6	5.5%	21	19.3%	38	34.9%	29	26.6%	15	13.8%	109	100%
Moj tim je važan deo organizacije bolnice. / My team plays an important part in the organizational structure of the hospital.	5	4.6%	15	13.8%	14	12.8%	31	28.4%	44	40.4%	109	100%
Vođa tima se prema članovima odnosi sa poštovanjem. / The team leader treats the members with respect.	5	4.6%	9	8.3%	22	20.2%	42	38.5%	31	28.4%	109	100%
Vođa tima razume i vrednuje timski rad. / The team leader understands and values teamwork.	5	4.6%	13	11.9%	22	20.2%	41	37.6%	28	25.7%	109	100%

Tabela 8. Stepen slaganja ispitanika sa tvrdnjama o organizaciji timskog rada

Tvrdnja / Statement	Nikad / Never		Retko / Rarely		Ponekad / Sometimes		Često / Frequently		Veoma često / Very frequently		Ukupno / Total	
	n	%	n	%	n	%	n	%	n	%	N	%
Članovi tima dobijaju informacije o učinku tima u celini. / Team members receive information about team performance.	8	7.3%	18	16.5%	32	29.4%	36	33.0%	15	13.8%	109	100%
Članovi tima su nagrađeni za dobro obavljen posao. / Team members are rewarded for a job well done.	37	33.9%	35	32.1%	19	17.4%	13	11.9%	5	4.6%	109	100%
Moj tim ima pristup poslovnim informacijama. / Operational data are available to my team.	13	11.9%	37	33.9%	23	21.1%	21	19.3%	15	13.8%	109	100%
Moj tim dobija potrebne informacije od vođe tima. / My team receives the necessary information from the team leader.	3	2.7%	10	9.2%	29	26.6%	46	42.2%	21	19.3%	109	100%
Članovima tima se pružaju prilike za dodatno usavršavanje. / Team members are provided with opportunities for additional training.	21	19.3%	32	29.4%	30	27.5%	20	18.4%	6	5.5%	109	100%
Obuka je dostupna članovima tima onda kada je to potrebno. / Training is available to team members when needed.	20	18.4%	30	27.5%	33	30.3%	22	20.2%	4	3.7%	109	100%

Table 8. Degree of respondents' agreement with statements regarding teamwork organization

Funkcionisanje u timu

Prema tvrdnjama koje se odnose na funkcionisanje u timu, trećina ispitanika je iskazala da su često srećni što su članovi tima, dok je više od dve petine njih navelo da su često ponosni na postignuća svog tima i međusobno deljenje informacija. Takođe, trećina ispitanika ponekad ili često smatra da članovi tima uspešno balansiraju između potrebe za samostalnošću i postizanjem ličnih ciljeva i prednosti rada u timu (Tabela 9).

Team Functioning

According to statements related to team functioning, a third of the respondents stated that they are often happy to be a part of the team, while more than two-fifths indicated that they are often proud of their team's achievements and of information sharing amongst team members. Also, a third of the respondents sometimes or frequently believe that team members successfully balance the need for independence and achievement of personal goals with the advantages of working in a team (Table 9).

Tabela 9. Stepen slaganja ispitanika sa tvrdnjama o funkcionisanju u timu

Tvrdnja / Statement	Nikad / Never		Retko / Rarely		Ponekad / Sometimes		Često / Frequently		Veoma često / Very frequently		Ukupno / Total	
	n	%	n	%	n	%	n	%	n	%	N	%
Srećan sam što sam član ovog tima. / I am happy to be a part of this team.	5	4.6%	10	9.2%	31	28.4%	36	33.0%	27	24.8%	109	100%
Ponosna/sam na ono što postiže moj tim. / I am proud of my team's achievements	2	1.8%	9	8.3%	24	22.0%	47	43.1%	27	24.8%	109	100%
Članovi tima uspešno balansiraju između potrebe za samostalnošću i postizanjem ličnih ciljeva i prednosti rada u timu. / Team members successfully balance the need for independence and achievement of personal goals with the advantages of working in a team.	4	3.7%	9	8.3%	39	35.8%	39	35.8%	18	16.5%	109	100%
Članovi tima dele informacije jedni sa drugima. / Team members share information amongst themselves.	0	0.0%	15	13.8%	25	2.9%	47	43.1%	22	20.2%	109	100%

Table 9. Degree of respondents' agreement with statements regarding team functioning

UPRAVLJANJE, KULTURA, ORGANIZACIJA I FUNKCIONISANJE, PO TIMOVIMA U USTANOVI

Osnovni deskriptivni parametri skorova po celoj skali i po podskalama organizacionih jedinica, kao i rezultati ANOVA analize, prikazani su u **Tabeli 10**. ANOVA analiza je utvrdila postojanje statističke značajnosti za ostvareni skor skale u celini, kao i za skorove podskala *Kultura u timu* ($p < 0,05$) i *Funkcionisanje u timu* ($p < 0,01$). Sledstvenom *post-hoc* analizom utvrđeno je da je vrednost skora podskale *Kultura u timu* bila statistički značajno viša u SBO u odnosu na SAO ($p < 0,05$), dok je vrednost skora podskale *Funkcionisanje u timu* u SBO bila statistički značajno viša u odnosu na SAO ($p < 0,05$) i u odnosu na DB ($p < 0,01$).

Na osnovu cele skale svih aspekata timskog rada u celom uzorku, dominantno je bilo visoko zadovoljstvo timskim radom, koje je izraženo kod statistički

MANAGEMENT, CULTURE, ORGANIZATION, AND FUNCTIONING, BY HOSPITAL TEAMS

The basic descriptive parameters of the scores for the whole scale and the subscales of the organizational units, as well as the results of the ANOVA analysis, are presented in **Table 10**. The ANOVA analysis found the score for the total scale, as well as the scores for the subscales *Team Culture* ($p < 0.05$) and *Team Functioning* ($p < 0.01$) to be statistically significant. Consequent *post-hoc* analysis found that the value of the score for the subscale *Team Culture* was statistically significantly higher in the BIU, as compared to the AIU ($p < 0.05$), while the value of the score of the subscale *Team Functioning* in the BIU was statistically significantly higher, as compared to the AIU ($p < 0.05$) and the DH ($p < 0.01$).

Tabela 10. Razlike među timovima u pogledu upravljanja, kulture, organizacije i funkcionisanja (ANOVA analiza)

Cela skala / Total scale	as / am	sd	n	p
SAO / AIU	70.00	18.97	24	0.046*
SBO / BIU	82.11	14.35	28	
APS / OP	76.97	18.02	32	
DB / DH	71.44	17.07	25	
Upravljanje / Management	as / am	sd	n	p
SAO / AIU	21.08	4.23	24	0.102
SBO / BIU	23.61	3.75	28	
APS / OP	22.56	3.89	32	
DB / DH	21.32	4.73	25	
Kultura / Culture	as / am	sd	n	p
SAO / AIU	18.75	6.19	24	0.024*
SBO / BIU	23.57	5.00^{*vsAIU}	28	
APS / OP	21.69	6.02	32	
DB / DH	20.64	5.35	25	
Organizacija / Organization	as / am	sd	n	p
SAO / AIU	16.63	5.79	24	0.201
SBO / BIU	18.43	5.33	28	
APS / OP	18.19	5.93	32	
DB / DH	15.56	5.25	25	
Funkcionisanje / Functioning	as / am	sd	n	p
SAO / AIU	13.54	4.09	24	0.006
SBO / BIU	16.50	2.05^{*vsAIU**vsDH}	28	
APS / OP	14.53	3.53	32	
DB / DH	13.92	3.16	25	

Legenda: Podaci su prikazani kroz srednje vrednosti (as), standardnu devijaciju (sd), i broj ispitanika koji su davali odgovore (n);

* – $p < 0,05$, ** – $p < 0,01$

Table 10. Differences among teams regarding management, culture, organization, and functioning (ANOVA analysis)

Legend: Data are presented as mean values (arithmetic mean – am), standard deviation (sd), and the number of respondents who provided answers (n);

* – $p < 0.05$, ** – $p < 0.01$

Tabela 11. Zadovoljstvo izgrađenim timom u odnosu na sve aspekte timskog rada i posebno u odnosu na upravljanje, kulturu, organizaciju i funkcionisanje**Table 11.** Satisfaction with the team regarding all aspects of teamwork, and regarding management, culture, organization, and functioning, separately

Svi aspekti timskog rada / All aspects of teamwork	Zadovoljstvo izgrađenim timom - organizaciona jedinica / Satisfaction with the team – organizational unit								Ukupno / Total	
	SAO / AIU		SBO / BIU		APS / OP		DB / DH			
	n	%	n	%	n	%	n	%		
Nisko / Low	6	25.0%	1	3.6%	4	12.5%	4	16.0%	15	13.8%
Visoko / High	18	75.0%	27	96.4%	28	87.5%	21	84.0%	94	86.2%
Upravljanje / Management										
Nisko / Low	2	8.3%	1	3.6%	2	6.3%	4	16.0%	9	8.3%
Visoko / High	22	91.7%	27	96.4%	30	93.8%	21	84.0%	100	91.7%
Kultura / Culture										
Nisko / Low	9	37.5%	4	14.3%	5	15.6%	4	16.0%	22	20.2%
Visoko / High	15	62.5%	24	85.7%	27	84.4%	21	84.0%	87	79.8%
Organizacija / Organization										
Nisko / Low	10	41.7%	8	28.6%	11	34.4%	14	56.0%	43	39.5%
Visoko / High	14	58.3%	20	71.4%	21	65.6%	11	44.0%	66	60.6%
Funkcionisanje / Functioning										
Nisko / Low	7	29.2%	0	0.0%	4	12.5%	2	8.0%	13	11.9%
Visoko / High	17	70.8%	28	100.0%	28	87.5%	23	92.0%	96	88.1%

preovlađujućeg broja ispitanika, odnosno kod njih 94 (86,2%); $p < 0,001$ (Tabela 11). Ispitanici su bili najzadovoljniji upravljanjem, funkcionisanjem u timu i kulturom, a najmanje organizacijom. Najzadovoljniji izgrađenim timom su bili ispitanici SBO, jer je kod njih bilo najviše ispitanika sa visokim zadovoljstvom radom u timu, kako po ukupnoj skali, tako i po sve četiri podskale. Ispitanici SBO, u odnosu na SAO, statistički su bili značajno zadovoljniji, po celoj skali, svim aspektima timskog rada ($p < 0,05$) i funkcionisanjem ($p < 0,01$), a organizacijom su bili zadovoljniji u odnosu na DB ($p < 0,05$).

Poređenjem nalaza u Tabeli 5 (prema godišnjem broju pacijenata po lekaru i apsentizmu) sa podacima u Tabeli 11 (svi aspekti timskog rada), možemo zaključiti da u organizacionoj jedinici gde je veće zadovoljstvo izgradnjom timskog rada postoje i bolje performanse, u smislu veće produktivnosti i manjeg apsentizma (SBO u odnosu na SAO). Naime, produktivnost rada je bila veća u SBO u odnosu na SAO, jer je broj pacijenata po lekaru bio 644 u SBO u odnosu na

Based on the total scale of all aspects of teamwork in the entire sample, high satisfaction with teamwork was dominant, which was expressed by a statistically predominant number of respondents, i.e., 94 (86.2%); $p < 0.001$ (Table 11). Respondents were most satisfied with management, team functioning, and culture, and least satisfied with organization. The respondents from the BIU were most satisfied with the team because they had the most respondents demonstrating high satisfaction with working in a team, both in the total scale and in all four subscales. BIU respondents, compared to AIU respondents, were statistically significantly more satisfied, in the total scale, with all aspects of teamwork ($p < 0.05$) and functioning ($p < 0.01$), and they were more satisfied with the organization, as compared to the DH ($p < 0.05$).

By comparing the findings in Table 5 (according to the annual patient count per doctor and absenteeism) with the data in Table 11 (all aspects of teamwork), we can conclude that in the organizational unit where there is greater satisfaction with building teamwork, there is

603 u SAO, i ovo je u skladu sa subjektivno iskazanim zadovoljstvom timskim radom na osnovu cele skale kao i podskale *Funkcionisanje u timu*. Ipak, apsentizam je nešto veći u SBO nego u SAO, što može biti i posledica veće opterećenosti lekara u ovoj organizacionoj jedinici. Nekompletno potvrđivanje polazne hipoteze može biti posledica relativno malog broja ispitanika po organizacionim jedinicama, a posebno malog broja lekara. U svakom slučaju, rezultati ukazuju na potrebne korekcije koje menadžment treba da sprovede u organizaciji timskog rada, kako bi već prilično visoko iskazano zadovoljstvo ispitanika timskim radom bilo još izraženije.

DISKUSIJA

Sprovedena studija predstavlja doprinos razumevanju elemenata timskog rada u rehabilitacionoj ustanovi sekundarnog nivoa zdravstvene zaštite u Republici Srbiji, koji su značajni za unapređenje kvaliteta medicinske rehabilitacije. Utvrđeno je da je potrebno unaprediti sve aspekte timskog rada i u svim organizacionim jedinicama ustanove. Takođe je potvrđeno da se izgradnjom timskog rada postižu bolje performanse, u smislu veće produktivnosti. Ovi rezultati su posebno važni ako se imaju u vidu relevantni dokazi iz sličnih istraživanja. Naime, pregled literature kojim su istraživani kriterijumi za procenu kvaliteta medicinske rehabilitacije na globalnom nivou, pokazao je da su, uprkos značajnim razlikama u organizaciji medicinske rehabilitacije, metodološki pristupi slični u pogledu osnovne namene i principa rehabilitacione medicine [14], pa je na izgradnji timskog rada potrebno više raditi.

Timski rad je važan instrument organizacionog razvoja i upravljanja kvalitetom. U medicinskoj rehabilitaciji, multidisciplinarni timovi su neophodnost. Rezultati analize sastava i funkcionisanja tima sačinjenog od profesionalaca različitih disciplina, kao i timskog rada, doprinose sagledavanju složenih procesa rada, uklopljenosti uloga i aktivnosti članova tima, kao i optimizaciji performansi tima, kao krajnjoj svrsi. Na osnovu podataka iz sedam evropskih zemalja [15], koji su se odnosili na povezanost sistema upravljanja kvalitetom sa percepcijom timskog rada, ukazano je na značaj pozitivne percepcije i ocene timskog rada za bezbednost medicinske nege pacijenata. Slično je potvrđeno i u našem istraživanju. Naime, najveće zadovoljstvo timskim radom je iskazano u SBO, čiji pripadnici su ostvarivali bolje performanse i manji apsentizam. S tim u vezi, pozitivna percepcija timskog rada može poboljšati aspekte organizacije, funkcionisanja, upravljanja i razvijanja optimalnog timskog procesa.

also better performance, in terms of higher productivity and less absenteeism (BIU compared to AIU). Namely, work productivity was higher in the BIU compared to the AIU, because the patient count per doctor was 644 in the BIU, as compared to 603 in the AIU, and this is in keeping with the subjectively expressed satisfaction with teamwork, based on the total scale as well as the *Team Functioning* subscale. However, absenteeism is somewhat higher in the BIU than in the AIU, which may also result from the higher workload of doctors in this organizational unit. Incomplete confirmation of the initial hypothesis may stem from the relatively small number of respondents per organizational unit, especially the small number of doctors. In any case, the results indicate the necessary adjustments that the management should implement in teamwork organization so that respondent satisfaction with teamwork, which is already quite high, would be even higher.

DISCUSSION

The study aims to contribute to the understanding of the elements of teamwork significant for improving the quality of medical rehabilitation in a rehabilitation facility at the secondary level of health care in the Republic of Serbia. It was determined that it is necessary to improve all aspects of teamwork in all the hospital organizational units. It was also confirmed that, by building teamwork, better performance is achieved, in terms of higher productivity. These results are particularly important when considering the relevant evidence from similar studies. Namely, the review of the literature, which investigated the criteria for assessing the quality of medical rehabilitation at the global level, showed that, despite the significant differences in the organization of medical rehabilitation, the methodological approaches are similar, in terms of the basic purpose and principles of rehabilitation medicine [14], and more needs to be done in the domain of teambuilding.

Teamwork is an important instrument of organizational development and quality management. In medical rehabilitation, multidisciplinary teams are a necessity. The results of the analysis of the structure and functioning of a team made up of professionals from different disciplines and of teamwork contribute to the understanding of complex work processes, the integration of roles and activities of team members, as well as the optimization of team performance, as the ultimate goal. Data from seven European countries [15] demonstrate the link between the quality management system and the perception of teamwork, as well as the significance of positive perception and assessment of teamwork for the safety of medical

Za sada, postoji samo nekoliko empirijskih studija koje su analizirale timski rad na polju zdravstvene zaštite, a posebno na polju stacionarne medicinske rehabilitacije [16]. Iako je izgradnja i negovanje timskog rada najvažnija za rehabilitaciju, do sada nije postignut konsenzus po mnogim pitanjima povezanim sa ovako složenim konceptom timskog rada, kao što su: konfiguracija i sukobi u timu, timski proces, organizacioni kontekst timskog rada, obrasci komunikacije, te efekti različitih karakteristika tima na ishode lečenja pacijenata [16]. Faktori savremene rehabilitacione doktrine, kao što su holistički pristup, multidisciplinarni timski rad, evaluacija ishoda lečenja, i drugi, nisu dovoljno afirmisani u svakodnevnoj rehabilitacionoj praksi zdravstvenog sistema Republike Srbije.

Nedostatak istraživanja u našoj literaturi koja se odnose na područje timskog rada u našim rehabilitacionim ustanovama navodi nas da zaključke donosimo na osnovu podataka o istraživanjima u rehabilitacionim centrima zemalja nama približnog nivoa razvoja. Studija sprovedena u Hrvatskoj koja se odnosila na analizu zadovoljstva i motivacije fizioterapeuta, te analizu faktora koji na njih utiču, pokazala je da 71% fizioterapeuta nije imalo zadovoljavajuću opremu i sredstva za adekvatno obavljanje posla, 75% nije imalo priliku da radi poslove za koje su se edukovali, a 77% ispitanika se izjasnilo da u prethodnih sedam dana niko nije pohvalio njihov rad [17]. U našem istraživanju, rezultati su ukazali na to da skoro polovina ispitanika ili manje nije bila zadovoljna aspektima organizacije, te upućivanjem na dodatno usavršavanje, a da trećina članova tima nikada nije bila nagrađena za dobro obavljen posao.

Analiza timskog rada u našem istraživanju je bila svojevrsan instrument organizacionog razvoja i upravljanja kvalitetom u ustanovi medicinske rehabilitacije, jer, osim što je članovima tima pružila informacije o sadržaju timskog rada, ona je time i doprinela poboljšanju timskog duha u medicinskoj rehabilitaciji. Analiza timova je omogućila procenu elemenata timskog rada i istakla koliko je važno da menadžeri poseduju veštine neophodne za građenje timova i negovanje timskog rada u medicinskoj rehabilitaciji kako bi se povećala produktivnost i smanjio apsentizam.

Nalazi drugih istraživača takođe sugerišu da je u periodu od dvanaest meseci nakon uvođenja programa osmišljenog da promoviše efikasniji timski rad došlo do poboljšanja usluga, povećanja poverenja unutar tima i smanjenja stepena odsustvovanja osoba (medicinske sestre, lekari, fizioterapeuti, socijalni radnici, radni terapeuti) [15]. S tim u vezi, naglašen je značaj timskih sastanaka i osećaj pripadnosti timu, što je i preporuka našeg istraživanja, kako bi se obez-

patient care. The same was confirmed in our study. Namely, the greatest satisfaction with teamwork was expressed in the BIU, whose members achieved better performance and lower absenteeism. In this regard, a positive perception of teamwork can improve the aspects of organization, functioning, management, and the development of an optimal team process.

Currently, there is only a handful of empirical studies analyzing teamwork in the domain of health care, particularly in the field of inpatient medical rehabilitation [16]. Although building and nurturing teamwork is of the utmost importance in rehabilitation, so far no consensus has been reached on many issues related to such a complex teamwork concept, namely: team configuration and conflicts in the team, team process, organizational context of teamwork, communication patterns, and effects of different team characteristics on patient treatment outcomes [16]. Factors of modern rehabilitation doctrine, such as a holistic approach, multidisciplinary teamwork, evaluation of treatment outcomes, etc., are not sufficiently promoted in the daily rehabilitation practice of the Republic of Serbia healthcare system.

The scarcity of research in Serbian literature related to teamwork in Serbian rehabilitation facilities leads us to draw conclusions based on data from research conducted in rehabilitation centers in countries with a similar level of development as Serbia. A study conducted in Croatia, analyzing the satisfaction and motivation of physical therapists and the factors that influence them, showed that 71% of physical therapists did not have satisfactory equipment and means for adequately performing their work, 75% did not have the opportunity to work in jobs that they were trained for, and 77% of respondents declared that in the preceding seven days, no one had praised their work [17]. In our study, the results indicated that almost half of the respondents, or less, were not satisfied with the organizational aspects and the additional training opportunities offered, while a third of the team members had never been rewarded for a job well done.

The analysis of teamwork in our study was, in effect, an instrument of organizational development and quality management in a medical rehabilitation facility, because, in addition to providing team members with information about the content of teamwork, it also contributed to the improvement of team spirit in medical rehabilitation. The analysis of the teams enabled the assessment of the elements of teamwork and highlighted how important it is for managers to possess the skills necessary to build teams and foster teamwork in medical rehabilitation, in order to increase productivity and reduce absenteeism.

Findings from other studies also suggest that in

bedile povratne informacije i odavanje priznanja za uspešno sprovedene aktivnosti. Razvijanje preciznih metoda za merenje efikasnosti tima biće od presudnog značaja za poboljšanje kvaliteta. Mali je broj literaturnih podataka i koncepata koji sistematski upoređuju i objašnjavaju efikasan timski rad. Većina alata za merenje efikasnosti tima primenjuje se u primarnoj zdravstvenoj zaštiti ili u hirurškim uslovima. Stoga je potrebno više rada na razvoju metoda za istraživanje u drugim kliničkim okruženjima, poput službe za rehabilitaciju.

ZAKLJUČAK

Analizom izabranih pokazatelja performansi kvaliteta timskog rada – godišnji broj pacijenata po lekaru i broj dana odsustvovanja sa posla, potvrđeno je da se izgradnjom timskog rada postižu bolje performanse, u smislu veće produktivnosti i smanjenja apsentizma. Potrebno je unapređenje veština menadžmenta u pogledu organizacije timskog rada i izgradnje timova. Rezultati ovog istraživanja mogu biti korisni za rukovodioce zdravstvenih ustanova koji pojedine aspekte timskog rada u medicinskoj praksi nesvesno stavljaju u drugi plan, a svesno stavljaju naglasak samo na kvantitet radne efikasnosti.

Etičko odobrenje

Istraživanje je odobreno od strane Etičkog odbora i Uprave Specijalne bolnice za cerebralnu paralizu i razvojnu neurologiju, dana 18. 12. 2020. godine, Odluka br. 338/I.

Zahvalnica

Istraživanje je deo master teze pod nazivom „Značaj timskog rada za unapređenje kvaliteta u medicinskoj rehabilitaciji“, na master akademskim studijama: *Menadžment u sistemu zdravstvene zaštite*. Teza je odbranjena na Medicinskim fakultetu Univerziteta u Beogradu, pod mentorstvom prof. dr Milene Šantrić Milićević, dana 29. 09. 2021. godine.

Sukob interesa: Nije prijavljen.

the twelve months following the introduction of a program designed to promote more effective teamwork, there was an improvement in services, an increase in trust within the team, and a drop in staff absenteeism (nurses, doctors, physical therapists, social workers, occupational therapists) [15]. In that sense, the importance of team meetings and the feeling of belonging to the team was emphasized, which is also the recommendation of our study, so as to provide feedback and recognition for successfully implemented activities. Developing accurate methods for measuring team effectiveness is going to be critical for quality improvement. There is a limited number of literature data and concepts that systematically compare and explain effective teamwork. Most tools for measuring team effectiveness are applied in primary care or surgical settings. Therefore, more work is needed to develop research methods for other clinical settings, such as rehabilitation services.

CONCLUSION

The analysis of selected performance indicators of teamwork quality – annual patient count per doctor and number of days of absence from work, confirmed that better performance is achieved by building teamwork, in terms of higher productivity and a drop in absenteeism. It is necessary to improve management skills regarding teamwork organization and team building. The results of this study can be useful for health facility managers who unwittingly give less attention to certain aspects of teamwork in medical practice while consciously putting emphasis only on the quantity of work efficiency.

Ethical approval

The study was approved by the Ethics Committee and the Administration of the Special Hospital for Cerebral Palsy and Developmental Neurology, on December 18, 2020, Decision No. 338/I.

Acknowledgments

The study is part of the master's thesis: *The importance of teamwork for quality improvement in medical rehabilitation*, within the program of master academic studies: *Management in the Health Care System*. The thesis was defended at the University of Belgrade Faculty of Medicine, under the mentorship of Prof. Milena Šantrić Milićević, PhD, on September 29, 2021.

Conflict of interest: None declared.

LITERATURA / REFERENCES

- White book on Physical and Rehabilitation Medicine in Europe. *J Rehabil Med*. 2007 Jan;(Suppl 45):6-47. doi: 10.2340/16501977-0028.
- UEMS-PRM Section and Board. European definition of Physical and Rehabilitation Medicine. [Internet]. Available from: <https://uems-prm.eu/the-specialty/>
- Paxino J, Denniston C, Woodward-Kron R, Molloy E. Communication in interprofessional rehabilitation teams: a scoping review. *Disabil Rehabil*. 2022 Jun;44(13):3253-69. doi: 10.1080/09638288.2020.1836271.
- Bendowska A, Baum E. The Significance of Cooperation in Interdisciplinary Health Care Teams as Perceived by Polish Medical Students. *Int J Environ Res Public Health*. 2023 Jan 5;20(2):954. doi: 10.3390/ijerph20020954.
- Brown SA, Sparapani R, Osinski K, Zhang J, Blessing J, Cheng F, et al.; Cardio-Oncology Artificial Intelligence Informatics & Precision (CAIP) Research Team Investigators. Team principles for successful interdisciplinary research teams. *Am Heart J Plus*. 2023 Jun 3;32:100306. doi: 10.1016/j.ahjo.2023.100306.
- Schmutz JB, Meier LL, Manser T. How effective is teamwork really? The relationship between teamwork and performance in healthcare teams: a systematic review and meta-analysis. *BMJ Open*. 2019 Sep 12;9(9):e028280. doi: 10.1136/bmjopen-2018-028280.
- Andersson, D, Rankin A, Diptee D. Approaches to team performance assessment: a comparison of self-assessment reports and behavioral observer scales. *Cogn Tech Work*. 2017 Sep 1; 19(2-3):517-28. doi: 10.1007/s10111-017-0428-0.
- Tempelaar D, Rienties B, Nguyen Q. Subjective data, objective data and the role of bias in predictive modelling: Lessons from a dispositional learning analytics application. *PLoS One*. 2020 Jun 12;15(6):e0233977. doi: 10.1371/journal.pone.0233977.
- Torres PL, Cornide-Reyes H. Team performance assessment and improvement in an agile methodology framework. 2022 XLVIII Latin American Computer Conference (CLEI), Armenia, Colombia, 2022;1-10. doi: 10.1109/CLEI56649.2022.9959959.
- Traylor AM, Thomas EJ, Salas E. Measuring Collaboration in Health Care: Insights from the Science of Teamwork. *Jt Comm J Qual Patient Saf*. 2020 Dec;46(12):661-3. doi: 10.1016/j.jcjq.2020.09.003.
- O'Leary KJ, Manojlovich M, Johnson JK, Estrella R, Hanrahan K, Leykum LK, et al. A Multisite Study of Interprofessional Teamwork and Collaboration on General Medical Services. *Jt Comm J Qual Patient Saf*. 2020 Dec;46(12):667-72. doi: 10.1016/j.jcjq.2020.09.009.
- Kilpatrick K, Tchouaket É, Paquette L, Guillemette C, Jabbour M, et al. Measuring patient and family perceptions of team processes and outcomes in healthcare teams: questionnaire development and psychometric evaluation. *BMC Health Serv Res*. 2019 Jan 6;19(1):9. doi: 10.1186/s12913-018-3808-0.
- Anderson JE, Lavelle M, Reedy G. Understanding adaptive teamwork in health care: Progress and future directions. *J Health Serv Res Policy*. 2021 Jul;26(3):208-14. doi: 10.1177/1355819620978436.
- Shevchuk V, Yavorovenko O, Belyaeva N, Kurylenko IV. Medical rehabilitation system and its quality control in developed countries of the world. *Wiad Lek*. 2020;73(9 cz. 2):2040-3. doi: 10.36740/WLek202009227
- Buljac-Samardžić M, Doekhie KD, van Wijngaarden JDH. Interventions to improve team effectiveness within health care: a systematic review of the past decade. *Hum Resour Health*. 2020 Jan 8;18(1):2. doi: 10.1186/s12960-019-0411-3.
- Wespi R, Birrenbach T, Schaubert SK, Manser T, Sauter TC, Kämmer JE. Exploring objective measures for assessing team performance in healthcare: an interview study. *Front Psychol*. 2023 Oct 24;14:1232628. doi: 10.3389/fpsyg.2023.1232628.
- Lončarić I, Kovač I, Rilović Đurašin M, Harbuš R, Kauzlarić N. Interdisciplinarni timski rad – izazov u suvremenoj rehabilitaciji. *JAHŠ*. 2016; 2(2): 147-54. doi: 10.24141/2/2/7.

POZITIVNI TRENDovi KRETANJA BROJA MEDICINSKIH SESTARA I TEHNIČARA U CRNOJ GORI: PREGLED PERIODA OD 2014. DO 2023. GODINE

ORIGINALNI RAD

ORIGINAL ARTICLE

POSITIVE TRENDS IN THE NUMBER OF NURSES AND TECHNICIANS IN MONTENEGRO: AN OVERVIEW OF PERIOD BETWEEN 2014–2023

Lidija Šćepanović¹, Zoran Vujošević¹

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

¹ Institute of Public Health of Montenegro, Podgorica, Montenegro

SAŽETAK

Uvod: Postizanje univerzalne zdravstvene pokrivenosti je veliki izazov za sve zemlje, a napredak u velikoj meri zavisi od resursa kojima one raspolažu i njihove dostupnosti.

Cilj rada je da se sagleda obezbeđenost i dinamika kretanja broja medicinskih sestara i tehničara i njihova struktura u desetogodišnjem periodu 2014–2023. godine, te da se ispita da li je u posmatranom periodu došlo do promene u ujednačenosti distribucije medicinskih sestara i tehničara u odnosu na broj stanovnika po opštinama.

Metode: Izvršena je retrospektivna analiza podataka o medicinskim sestrama i tehničarima zaposlenim u javnim zdravstvenim ustanovama u Crnoj Gori za period 2014–2023. godine, u kojoj su glavne mere ishoda bile: longitudinalni porast broja medicinskih sestara i tehničara; odnos broja medicinskih sestara i tehničara i lekara; struktura medicinskih sestara i tehničara u pogledu pola, starosti, obrazovanja; Gini koeficijent je korišćen kao mera jednakosti raspodele medicinskih sestara i tehničara u odnosu na broj stanovnika po opštinama.

Rezultati: Obezbeđenost medicinskim sestrama i tehničarima se u periodu 2014–2023. povećala (porast stope za 24%) i dostigla vrednost 5,84 na 1000 stanovnika u 2023. godini, dok je odnos medicinskih sestara i tehničara i lekara u sistemu dostigao 2,04 : 1. Medicinske sestre i tehničari su dominantno ženskog pola, starosti 35–44 godina, a udeo zaposlenih muškog pola je u porastu (12,91 u 2014. godini u odnosu na 18,68 u 2023. godini). Petina medicinskih sestara i tehničara stekla je obrazovanje u višoj/visokoj školi. Gini koeficijent jednakosti raspodele medicinskih sestara i tehničara je opao sa 0,195 u 2014. godini na 0,191 u 2023. godini.

Zaključak: U poslednjih deset godina došlo je do značajnih pozitivnih promena u obezbeđenosti i strukturi medicinskih sestara i tehničara, na koje su verovatno imale uticaja mere zdravstvene politike koje su se sprovodile u vreme pandemije.

Ključne reči: medicinske sestre, zdravstvena radna snaga, zdravstvena politika

ABSTRACT

Introduction: Achieving universal health coverage is a major challenge for all countries, and progress largely depends on the resources they possess and their availability.

The aim of the paper is to review the provision and dynamics of the number of nurses/technicians and their structure in the ten-year period 2014–2023, as well as to examine whether there was a change in the equity of their distribution in relation to the number of inhabitants by municipalities.

Methodology: A retrospective analysis of data on nurses and technicians employed in public health institutions in Montenegro for the period 2014–2023 was conducted, focusing on the following outcomes: the longitudinal increase in the number of nurses, the nurse-to-doctor ratio, the distribution of nurses by sex, age, and education, and the Gini coefficient as a measure of inequality in the distribution of nurses relative to the population across municipalities.

Results: The density of nurses increased by 24% between 2014 and 2023, reaching 5.84 per 1,000 inhabitants in 2023, while the nurse-to-doctor ratio in the system reached 2.04 : 1. Nurses are predominantly female, aged 35–44, and the share of male nurses is increasing (12.91 in 2014 compared to 18.68 in 2023). One-fifth of the nurses have completed a college or university education. The Gini coefficient of inequality of distribution of nurses/technicians decreased from 0.195 in 2014, to 0.191 in 2023.

Conclusion: In the last ten years, there have been significant positive changes in the density and structure of nurses and technicians which have probably been influenced by the health policy measures implemented during the COVID-19 pandemic.

Keywords: nurses, health workforce, health policy

Autor za korespondenciju:

Lidija Šćepanović

Institut za javno zdravlje Crne Gore

Džona Džeksona bb, 81000 Podgorica, Crna Gora

Elektronska adresa: lidija.scepanovic@ijzcg.me

Corresponding author:

Lidija Šćepanović

Institute of Public Health of Montenegro

bb Džona Džeksona Street, 81000 Podgorica, Montenegro

E-mail: lidija.scepanovic@ijzcg.me

Primljeno • Received: September 19, 2024; **Revidirano • Revised:** November 12, 2024; **Prihvaćeno • Accepted:** November 20, 2024; **Online first:** December 25, 2024

DOI: 10.5937/smdlk5-53578

UVOD

Sve zemlje se susreću sa velikim izazovima u postizanju adekvatne obezbeđenosti zdravstvenim kadrovima, posebno medicinskim sestrama i tehničarima, kao važnim i najbrojnijim segmentom zdravstvene radne snage. Međutim, zadovoljavajuća obezbeđenost ljudskim resursima nije garancija da će zdravstveni sistem biti otporan na veliki broj izazova sa kojima se suočava i uspešan sistem na putu postizanja univerzalne zdravstvene pokrivenosti. Samo kada su ljudski resursi raspoređeni tako da obezbeđuju visok nivo pravičnosti i dostupnosti zdravstvene zaštite, te kada su kompetentni i motivisani, mogu da pruže zdravstvenu zaštitu očekivanog kvaliteta i socio-kulturnih standarda [1,2].

Crna Gora je zemlja u kojoj je zdravstveni sistem dominantno zasnovan na kapacitetima u državnom vlasništvu. U novom milenijumu ulagani su naponi da se zdravstveni sistem ojača kroz snaženje primarne zdravstvene zaštite, timova izabranih doktora i medicinskih sestara i tehničara u pogledu njihovih kompetencija i uloga [3,4]. U periodu nakon reforme, donešen je plan razvoja zdravstva (od 2015. do 2020. godine), koji je postavio strateške pravce razvoja ljudskih resursa: redovne edukacije, kontinuirano unapređenje znanja i veština, razvijanje kapaciteta za upravljanje ljudskim resursima i mobilnost zdravstvenih radnika [5]. Plan ljudskih resursa u zdravstvu (od 2013. do 2022. godine), predviđao je porast broja angažovanih lekara u sistemu, dok je broj medicinskih sestara i tehničara trebalo da ostane konstantan [6].

Cilj ovog rada je da ispita obezbeđenost i dinamiku kretanja broja medicinskih sestara i tehničara u desetogodišnjem periodu (od 2014. do 2023. godine), njihovu strukturu u pogledu pola, starosti i nivoa obrazovanja, te da sagleda da li je u posmatranom periodu došlo do promene u ujednačenosti geografske distribucije medicinskih sestara/ tehničara u odnosu na broj stanovnika po opštinama.

METODE

Jedinice posmatranja u istraživanju bile su medicinske sestre i tehničari koji rade u državnim zdravstvenim ustanovama na teritoriji Crne Gore, a čiji broj je obuhvatio vanbolničke i bolničke ustanove. Pod medicinskim sestrama i tehničarima se, prema važećem zakonodavstvu u Crnoj Gori, smatraju zdravstveni radnici koji obavljaju poslove opšte zdravstvene nege, kao dela zdravstvene zaštite, i imaju adekvatan nivo obrazovanja iz oblasti zdravstvene zaštite [7,8]. Ukupan broj medicinskih sestara i tehničara nije obuhvatio medicinske sestre ginekološko-akušerskog smera. U medicinske sestre i tehničare ne svrstavaju se rentgen tehničari, fizioterapeutske tehničari i laboratorijski tehničari, radi obezbeđivanja uporedivosti i usklađivanja sa izvešta-

INTRODUCTION

All countries face significant challenges in ensuring an adequate supply of health personnel, particularly nurses and technicians, who form a vital and substantial segment of the health workforce. However, an adequate supply of human resources alone does not guarantee that a health system will be resilient to the numerous challenges it faces or successful in progressing toward universal health coverage. Only when human resources are equitably distributed to ensure widespread access to healthcare, and when they are both competent and motivated, can they deliver care that meets expected quality and socio-cultural standards [1,2].

Montenegro's health system is predominantly built around state-owned facilities. In the new millennium, efforts have focused on strengthening the health system by enhancing primary healthcare and improving the competencies and roles of teams comprising chosen doctors and nurses/technicians [3,4]. Following the reform, the healthcare development plan (2015–2020) was adopted, outlining strategic directions for human resource development. These included regular education, continuous enhancement of knowledge and skills, capacity building for human resource management, and promoting the mobility of healthcare workers [5]. The Human Resources in Healthcare Plan (2013–2022) projected an increase in the number of doctors employed within the system, while maintaining a constant number of nurses and technicians [6].

This study aims to analyze the supply and trends in the number of nurses and technicians over a ten-year period (2014–2023), examining their demographic structure in terms of gender, age, and education level. Additionally, it seeks to determine whether the observed period saw changes in the geographic distribution of nurses and technicians relative to the population size across municipalities.

METHODS

The units of observation in this study were nurses and technicians employed in state health institutions across Montenegro, encompassing both outpatient and hospital settings. According to current legislation in Montenegro, nurses and technicians are healthcare professionals responsible for providing general health care services and are required to have an appropriate level of education in the healthcare field [7,8]. The total number of nurses and technicians excluded those specializing in gynecology and obstetrics. Nurses and technicians do not include radiology technicians, physiotherapy technicians, or laboratory technicians, in order to maintain comparability and alignment with

vanjem u zemljama EU. Prilikom izračunavanja odnosa između broja medicinskih sestara i tehničara i lekara uzet je ukupan broj lekara koji su u navedenom periodu bili angažovani u javnim zdravstvenim ustanovama.

Osim primene deskriptivnih metoda (apsolutni i relativni brojevi) izračunavani su indeksi promene u broju medicinskih sestara i tehničara za period od 2014. do 2023. godine, kao i stope obezbeđenosti medicinskim sestrama i tehničarima na 1000 stanovnika po godinama posmatranog perioda. Na osnovu izračunatih stopa obezbeđenosti medicinskim sestrama i tehničarima i stopa rasta njihovog broja, dobijene su linije trenda koje pokazuju njihovo prosečno kretanje između 2014. i 2023. godine.

Demografske odrednice koje su korišćene bile su pol (muški/ženski) i starost (starosne grupe: do 34 godine, 35-44 godine, 45-54 godine, 55 i više godina). Za potrebe istpitivanja jednakosti raspodele medicinskih sestara i tehničara u odnosu na broj stanovnika po opštinama, koristili smo Gini koeficijent [9-11]. Koristeći kumulativni procenat stanovništva kao apscisu i kumulativni procenat medicinskih sestara kao ordinatu, nacrtali smo Lorencovu krivu distribucije medicinskih sestara i tehničara u odnosu na stanovništvo po opštinama. Gini koeficijent se izračunava iz odnosa površina koju zahvata Lorencova kriva i površine ispod hipotetičke linije apsolutne jednakosti, a kreće se u rasponu od 0 do 1, gde 0 predstavlja savršenu jednakost, dok indeks od 1 predstavlja savršenu nejednakost. Sve operacije rađene su u „Excel“ programu softverskog paketa „Microsoft“.

Podaci o ljudskim resursima, koje prikuplja i objavljuje Institut za javno zdravlje Crne Gore, korišćeni su u izradi ovog rada. Za izračunavanje stopa korišćeni su podaci o stanovništvu koje objavljuje Uprava za statistiku MONSTAT. Za dobijanje uporednih pokazatelja za zemlje Evropskog regiona i šire, korišćeni su podaci iz međunarodnih baza podataka: OECD Health Statistics 2020, Eurostat Database, baza podataka Svetske zdravstvene organizacije.

REZULTATI

U desetogodišnjem periodu (od 2014. do 2023. godine) došlo je do povećanja broja angažovanih medicinskih sestara i tehničara. Na kraju 2023. godine u zdravstvenim ustanovama radilo je 3602 medicinske sestre i tehničara, što predstavlja povećanje od 23% u odnosu na 2014. godinu. Stopa medicinskih sestara i tehničara na 1000 stanovnika je bila u stalnom porastu u navedenom periodu. Ona se povećala za 24% u odnosu na 2014. godinu i dostigla vrednost od 5,84 na 1000 stanovnika u 2023. godini (Grafikon 1). Broj medicinskih sestara ginekološko-akušerskog smera je bio relativno konstantan, a u 2023. godini je iznosio 250 (Tabela 1).

reporting standards in EU countries. When calculating the ratio between the number of nurses/technicians and doctors, the total number of doctors employed in public health institutions during the specified period was considered.

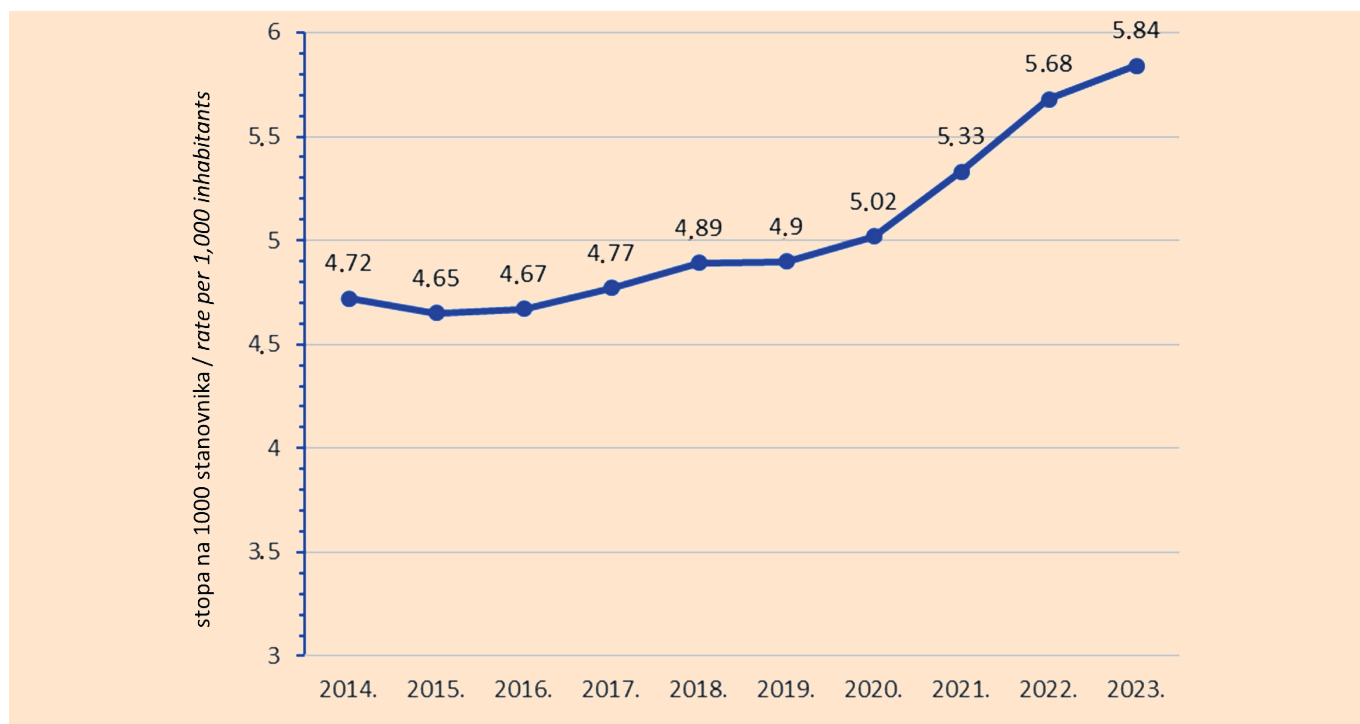
In addition to using descriptive methods (absolute and relative numbers), indices of change in the number of nurses and technicians were calculated for the period from 2014 to 2023. The rate of nurses and technicians per 1,000 inhabitants was also calculated for each year within the observed period. Based on the calculated rates of distribution of nurses/technicians and the growth rate of their numbers, trend lines were generated to illustrate their average movement between 2014 and 2023.

The demographic determinants used were gender (male/female) and age (age groups: up to 34 years, 35-44 years, 45-54 years, and 55 and over). To assess the equality of the distribution of nurses and technicians relative to the population size by municipality, we employed the Gini coefficient [9-11]. Using the cumulative percentage of the population as the abscissa and the cumulative percentage of nurses as the ordinate, we constructed a Lorenz curve to illustrate the distribution of nurses/technicians relative to the population by municipality. The Gini coefficient is calculated based on the ratio of the area under the Lorenz curve to the area beneath the hypothetical line of perfect equality. It ranges from 0 to 1, where 0 indicates perfect equality and 1 signifies perfect inequality. All calculations were performed using the “Excel” program within the “Microsoft” software package.

Data on human resources, collected and published by the Institute for Public Health of Montenegro, were used in the preparation of this study. To calculate the rates, population data published by the Statistical Office of Montenegro (MONSTAT) were used. For comparative indicators across European countries and beyond, data from international databases were utilized, including the OECD Health Statistics 2020, Eurostat Database, and the World Health Organization database.

RESULTS

Over the ten-year period from 2014 to 2023, the number of employed nurses/technicians increased. By the end of 2023, a total of 3,602 nurses and technicians were employed in healthcare institutions, reflecting a 23% increase compared to 2014. The rate of nurses and technicians per 1,000 inhabitants steadily increased throughout the mentioned period. By 2023, it had risen by 24% compared to 2014, reaching a value of 5.84 per 1,000 inhabitants (Graph 1). The number of gynecological-obstetrical nurses remained relatively constant, totaling 250 in 2023 (Table 1).



Grafikon 1. Broj medicinskih sestara/tehničara na 1000 stanovnika u Crnoj Gori u periodu od 2014. do 2023. godine

Graph 1. Number of nurses/technicians per 1,000 inhabitants in Montenegro from 2014 to 2023

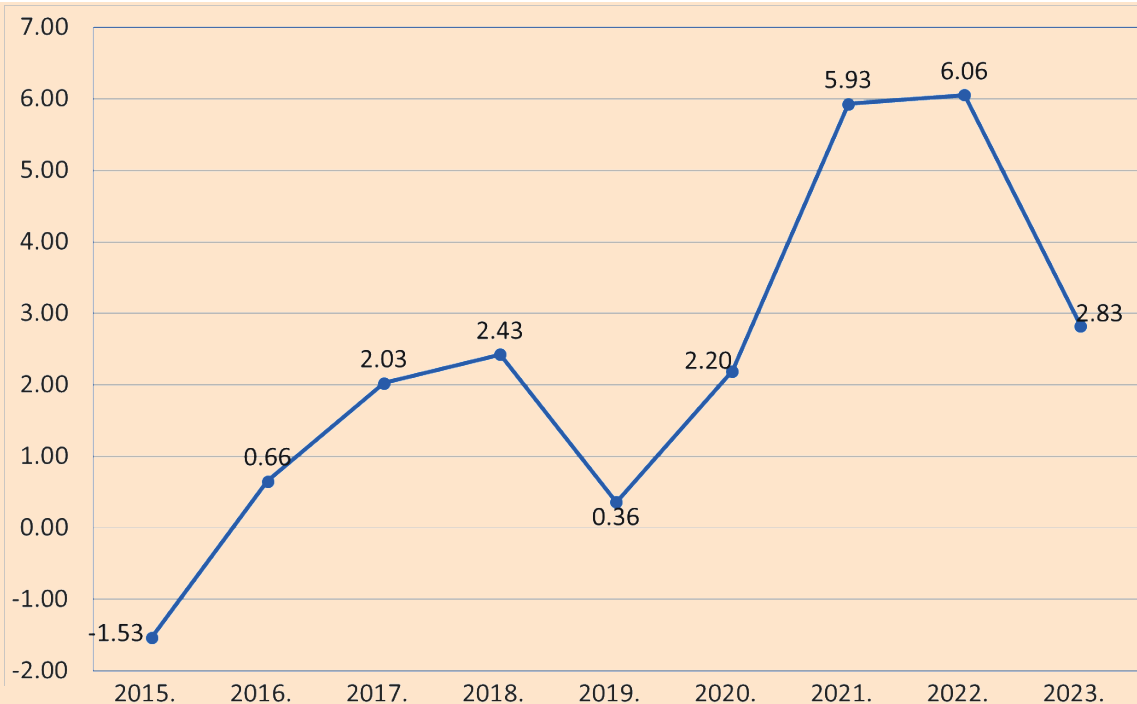
Na osnovu dinamike rasta broja medicinskih sestara i tehničara (prema stopi rasta po godinama posmatranog perioda), koja je prikazana na **Grafikonu 2**, uočavaju se dva dominantna intervala rasta: inicijalni period rasta (od 2014. do 2018.) i period dinamičnijeg rasta (od 2019. do 2022.). U prvom periodu, stopa ra-

Based on the growth dynamics of the number of nurses/technicians (according to the growth rate by years of the observed period), as shown in **Graph 2**, two dominant growth intervals can be identified: the initial growth phase (from 2014 to 2018) and a more rapid growth phase (from 2019 to 2022). In the first period, the growth rate of the number of nurses increased by

Tabela 1. Medicinske sestre/tehničari i sestre ginekološko-akušerskog smera u Crnoj Gori u periodu od 2014. do 2023. godine

Table 1. Number of nurses/technicians and gynecology-obstetrics nurses in Montenegro from 2014 to 2023

Godina / Year	Medicinske sestre/tehničari (broj) / Nurses/Technicians (number)	Medicinske sestre/tehničari (stopa na 1000 stanovnika) / Nurses/Technicians (rate per 1,000 inhabitants)	Medicinske sestre gin.-akušerskog smera (broj) / Gynecology-obstetrics nurses (number)
2014	2,935	4.72	243
2015	2,890	4.65	246
2016	2,909	4.67	228
2017	2,968	4.77	231
2018	3,040	4.89	243
2019	3,051	4.90	251
2020	3,118	5.02	256
2021	3,303	5.33	261
2022	3,503	5.68	255
2023	3,602	5.84	250



Grafikon 2. Dinamika rasta broja medicinskih sestara/tehničara u periodu od 2014. do 2023. godine

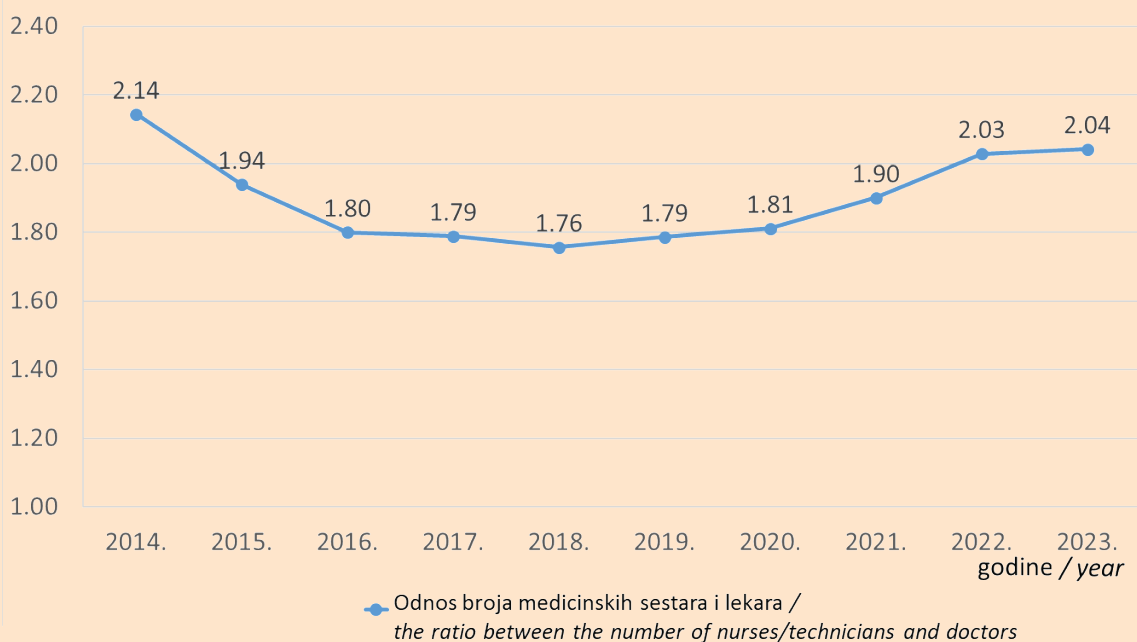
Graph 2. Growth dynamics of the number of nurses/technicians from 2014 to 2023

sta broja medicinskih sestara se povećala za 3,58%, a u drugom periodu nastavila je da raste još brže i ostvarila porast od 14,81% (Grafikon 2). Nakon 2022. godine, broj je rastao sporije, po stopi od 2,83%.

Odnos između broja medicinskih sestara i tehničara i lekara u javnim zdravstvenim ustanovama Crne Gore prikazan je na Grafikonu 3. Nakon 2014. godine

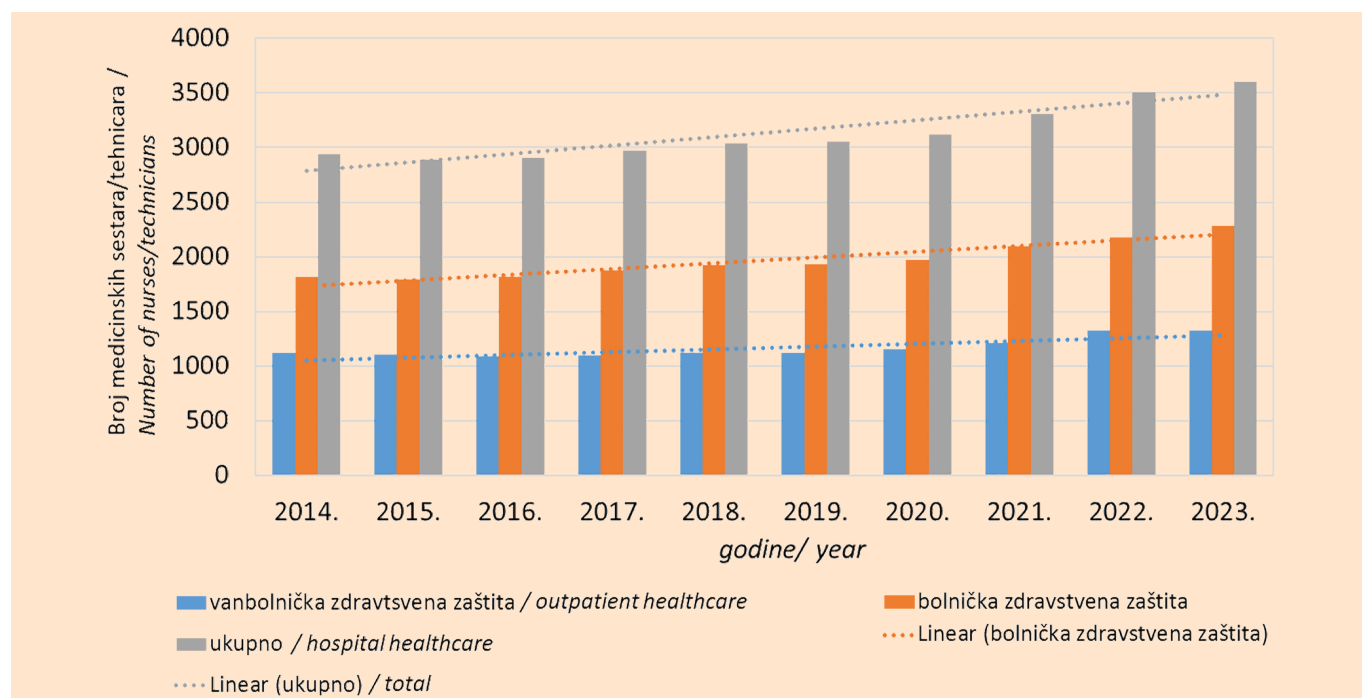
3.58%. In the second period, the growth rate accelerated further, reaching an increase of 14.81% (Graph 2). After 2022, the growth slowed, with a rate of 2.83%.

The ratio between the number of nurses/technicians and doctors in public health institutions in Montenegro is presented in Graph 3. After 2014, when the ratio was 2.14 : 1, it declined until 2018, reaching 1.76 : 1. From



Grafikon 3. Trend odnosa između broja medicinskih sestara/tehničara i lekara u Crnoj Gori u periodu od 2014. do 2023. godine

Graph 3. The trend in the ratio between the number of nurses/technicians and doctors in Montenegro from 2014 to 2023



Grafikon 4. Promene u distribuciji medicinskih sestara/tehničara u bolničkoj zdravstvenoj zaštiti, vanbolničkoj i u ukupnom broju u Crnoj Gori u periodu od 2014. do 2023. godine

Graph 4. Changes in the distribution of nurses/technicians across hospital healthcare, outpatient healthcare, and the total workforce in Montenegro from 2014 to 2023

Tabela 2. Medicinske sestre/tehničari po dobnim grupama i polu u javnim zdravstvenim ustanovama u Crnoj Gori, u 2014., 2019. i 2023. godini

Table 2. Nurses/Technicians by age group and gender in public health institutions in Montenegro: 2014, 2019, and 2023

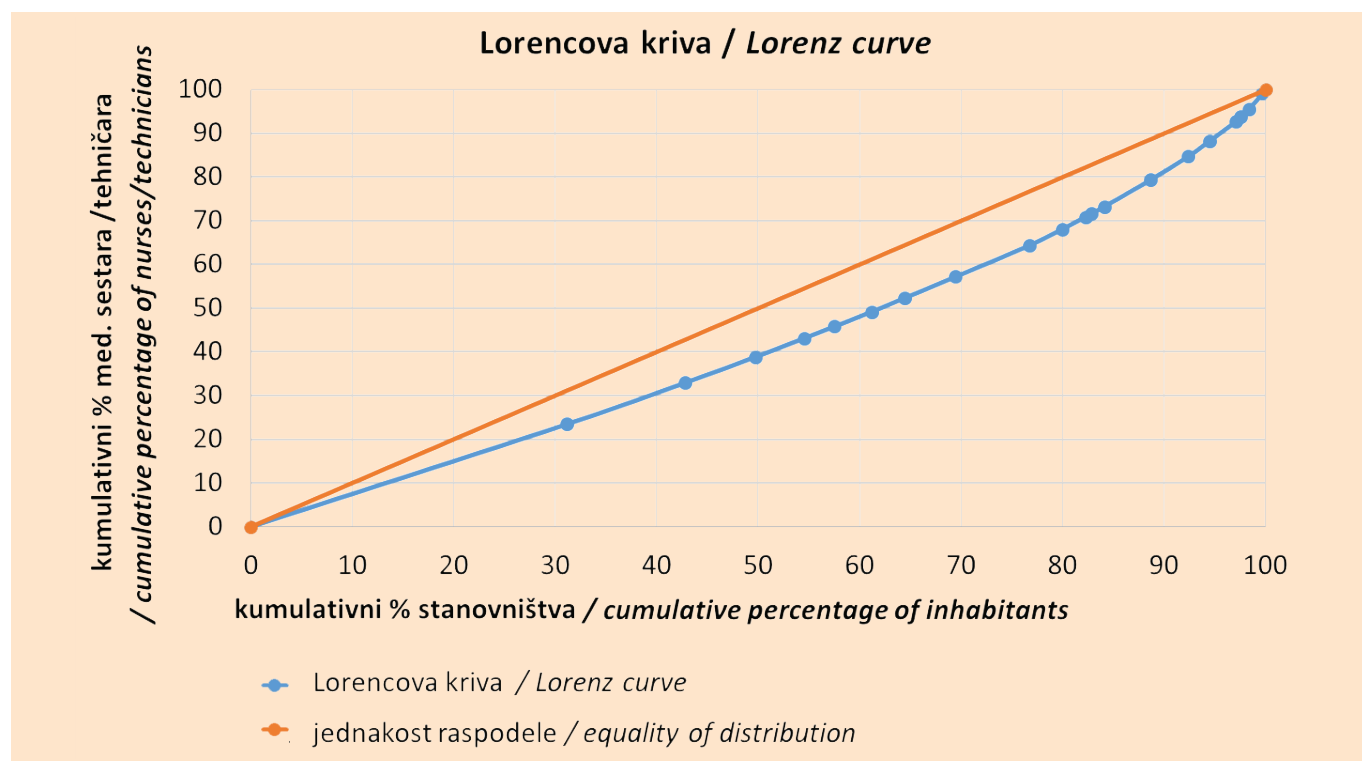
Medicinske sestre/tehničari / Nurses/Technicians	2014		2019		2023	
	Broj / Number	%	Broj / Number	%	Broj / Number	%
< 34	737	25.1	876	28.7	1,000	27.8
35–44	721	24.6	729	23.9	1,158	32.1
45–54	1,031	35.1	733	24	610	16.9
55 +	446	15.2	713	23.4	834	23.2
Ukupno / Total	2,935	100	3,051	100	3,602	100
Pol / Gender						
muški / Male	379	12.91	480	15.73	673	18.68
ženski / Female	2,556	87.09	2571	84.27	2929	81.32
Ukupno / Total	2,935	100	3051	100	3602	100
Nivo obrazovanja / Education						
visoka i viša SS / higher	229	7.8	411	13.5	771	21.4
srednja SS / secondary	2,706	92.2	2,640	86.5	2,832	78.6
Ukupno / Total	2,935	100	3,051	100	3,602	100

kada je ovaj odnos iznosio 2,14 : 1, dolazi do pada u periodu do 2018. godine (odnos 1,76 : 1), a zatim do blagog rasta u periodu do 2023. godine kada je dostignuto 2,04 : 1.

U 2023. godini najveći broj zaposlenih medicinskih sestara i tehničara (63,33%) radio je u bolničkoj zdrav-

2018 to 2023, the ratio showed a slight increase, reaching 2.04 : 1 by the end of the period.

In 2023, the majority of employed nurses/technicians (63.33%) worked in hospital healthcare, while 36.67% were employed in outpatient healthcare. This distribution has shifted slightly compared to 2014,



Grafikon 5. Nejednakost raspodele medicinskih sestara/tehničara u zdravstvenim ustanovama u Crnoj Gori u 2023. godini

Graph 5. Inequality in the distribution of nurses/technicians across health institutions in Montenegro in 2023

stvenoj zaštiti, dok je 36,67% radilo u vanbolničkoj. Zastupljenost broja medicinskih sestara i tehničara neznatno se promenila u odnosu na 2014. godinu, kada je navedeni odnos iznosio 61,91% : 38,09% u korist bolničke zdravstvene zaštite (Grafikon 4).

Najveći broj medicinskih sestara i tehničara je u 2023. godini bilo u dobnoj grupi 35-44 godina starosti. Broj medicinskih sestara i tehničara te životne dobi je u periodu od 2014. godine bio u porastu, isto kao i broj medicinskih sestara i tehničara u dobnim grupama do 34 godine starosti i u dobnoj grupi 55 i više godina. Istovremeno, smanjio se broj medicinskih sestara u dobnoj grupi 45-54 godina starosti. Među medicinskim sestrama i tehničarima u javnim zdravstvenim ustanovama dominirale su osobe ženskog pola u svim godinama posmatranog perioda. Udeo zaposlenih muškog pola se povećao sa 12,91 u 2014. godini na 18,68 u 2023. godini (Tabela 2). Udeo medicinskih sestara i tehničara sa visokom/višom školskom spremom se povećao sa 7,8% u 2014. godini na 21,4% u 2023. godini. Taj broj obuhvatio je medicinske sestre i tehničare koji su stekli diplomu četvorogodišnjih, trogodišnjih studija i više škole (dvogodišnje).

Kako bismo ispitali ujednačenost raspodele medicinskih sestara i tehničara u 22 opštine u Crnoj Gori, a u odnosu na broj stanovnika, izračunat je Gini koeficijent za početnu i krajnju godinu posmatranog vremenskog intervala. Gini koeficijent koji se odnosi na nejednakost

when the ratio was 61.91% in favor of hospital health-care and 38.09% in outpatient care (Graph 4).

In 2023, the largest proportion of nurses/technicians belonged to the 35-44 age group. The number of nurses/technicians in the 35-44 age group has been increasing since 2014, along with the number in the up-to-34 and 55-and-older age groups. At the same time, the number of nurses in the 45-54 age group decreased. In public health institutions, females consistently dominated among nurses/technicians throughout the observed period. However, the proportion of male employees increased from 12.91% in 2014 to 18.68% in 2023 (Table 2). The proportion of nurses/technicians with higher education increased from 7.8% in 2014 to 21.4% in 2023. This category includes nurses/technicians who completed four-year and three-year degree programs, as well as those with a two-year higher education diploma.

To assess the uniformity of the distribution of nurses/technicians across the 22 municipalities in Montenegro relative to the population size, the Gini coefficient was calculated for the start and end years of the observed period. The Gini coefficient, which measures the inequality of this distribution, decreased from 0.195 in 2014 to 0.191 in 2023. The distribution for the final year of the period is visually represented in the graph, using the Lorenz curve.

raspodele medicinskih sestara i tehničara se smanjio sa 0,195 u 2014. godini na 0,191 u 2023. godini. Navedena raspodela za poslednju godinu tog perioda je grafički prikazana na grafikonu prikazom Lorencove krive.

DISKUSIJA

U periodu od 2014. do 2023. godine sumiraju se rezultati reforme zdravstvenog sistema Crne Gore, u kojoj je broj medicinskih sestara i tehničara značajno redukovano. Iako strateška dokumenta nisu predviđala da će broj medicinskih sestara i tehničara rasti, već ostati konstantan, njihov broj je u navedenom periodu konstantno rastao i ukupno se povećao za skoro četvrtinu. Porast broja medicinskih sestara i tehničara u sistemu je bio neophodan kako bi se odgovorilo na porast potražnje uzrokovane globalnim izazovima koji nisu zaošli Crnu Goru, kao što su demografske promene (starenje stanovništva, nizak natalitet), porast hroničnih nezaraznih bolesti, zdravstvene krize, i drugo.

Uprkos porastu, stopa obezbeđenosti medicinskim sestrama i tehničarima u Crnoj Gori je i dalje relativno niska ako se uporedi sa evropskim zemljama. U većini zemalja EU je u periodu od 2010. do 2020. godine takođe došlo do porasta stope obezbeđenosti medicinskim sestrama, posebno u Finskoj, Irskoj i Nemačkoj, koje imaju i najveće stope obezbeđenosti navedenim kadrom, a prosečno je u zemljama EU stopa iznosila 8 na 1000 stanovnika [12]. Među zemljama regiona Jugoistočne Evrope, slične stope obezbeđenosti medicinskim sestrama i tehničarima onima u Crnoj Gori u 2022. godine prijavile su Srbija i Severna Makedonija [12]. Poznato je da je interpretacija i uporedivost međunarodno prikupljenih podataka o ljudskim resursima u velikoj meri otežana usled razlika među zemljama u pogledu organizacije zdravstvenog sistema i izveštavanja.

Druga značajna odrednica perioda koji smo posmatrali je pandemija izazvana Kovidom 19. Zemlje koje su imale značajno niže stope obezbeđenosti medicinskim sestrama i tehničarima imale su u vreme pandemije izazvane Kovidom 19 veće probleme usled izgaranja postojećeg kadra, lošijeg kvaliteta usluga koje su pružali i veću stopu odliva iz sistema [13]. U Crnoj Gori pandemija je uticala na porast potražnje medicinskih sestara i tehničara, na šta ukazuje ubrzanje stope njihovog rasta. U pandemijskim godinama desile su se velike promene na primarnom nivou zdravstvene zaštite u pogledu transformacije modela pružanja usluga i upravljanja, što je verovatno doprinelo tome da potrebe za kadrom budu još veće. Kako bi se sprečile migracije i zadržali zdravstveni radnici u zdravstvenom sistemu, na nacionalnom nivou su implementirane *ad hoc* mere povećanja plata zdravstvenim radnicima, poboljšani uslovi rada (nova oprema, modernizacija pro-

DISCUSSION

Between 2014 and 2023, the outcomes of Montenegro's healthcare system reform were evaluated, revealing a significant reduction in the number of nurses and technicians. Although the strategic documents projected that the number of nurses and technicians would remain constant, their numbers consistently increased during the specified period, ultimately growing by nearly a quarter. The increase in the number of nurses and technicians within the system became essential to address the rising demand driven by global challenges affecting Montenegro. These included demographic shifts such as an aging population and low birth rates, a surge in chronic non-communicable diseases, health crises, and other emerging issues.

Despite the increase, the distribution of nursing workforce in Montenegro remains relatively low compared to European standards. Between 2010 and 2020, most EU countries also experienced an increase in the distribution of nursing workforce, with Finland, Ireland, and Germany leading the way, having the highest ratios. On average, the nurse-to-population ratio in EU countries during this period was 8 per 1,000 inhabitants [12]. In 2022, Serbia and North Macedonia reported the distribution of nursing workforce comparable to that of Montenegro among countries in the Southeast European region [12]. The interpretation and comparability of internationally collected data on healthcare human resources are challenging, largely due to differences in health system organization and reporting practices across countries.

Another key factor during the observed period was the COVID-19 pandemic. Countries with significantly lower density of nursing personnel faced greater challenges, including increased staff burn-out, a decline in the quality of services provided, and higher attrition rates within the healthcare system [13]. In Montenegro, the pandemic led to a significant increase in the demand for nurses and technicians, which was reflected in the accelerated growth rate of their numbers. During the pandemic years, significant changes occurred at the primary healthcare level, including transformations in service delivery and management models, which likely contributed to an even greater need for staffing. To prevent migration and retain healthcare workers within the system, the government implemented *ad hoc* measures, including salary increases for health workers, improvements in working conditions (such as new equipment and the modernization of work processes), and educational programs at the state university

cesa rada), i uvedeni edukativni programi na državnom univerzitetu. Porast broja radno angažovanih medicinskih sestara i tehničara uticao je na popravljjanje odnosa broja medicinskih sestara i tehničara i lekara, koji je bio u padu nakon reformskih aktivnosti iz prethodnog perioda. Time se ovaj odnos primakao proseku EU iz 2020. godine koji je iznosio nešto više od dve medicinske sestre i tehničara po lekaru [12,14], a bio je veći od proseka u nekim zemljama regiona [15].

Medicinske sestre i tehničari su dominantno zaposleni u bolničkoj zdravstvenoj zaštiti, dok oko trećina medicinskih sestara radi u vanbolničkoj zdravstvenoj zaštiti. Njihova dinamika rasta u desetogodišnjem periodu ukazuje na blagu tendenciju jačanja ponude radne snage medicinskih sestara i tehničara u bolničkoj zdravstvenoj zaštiti. Najveći broj medicinskih sestara i tehničara je srednje životne dobi, što je rezultat zapošljavanja, posebno u pandemijskim godinama. Ipak, najstariji među njima (starosti 55+) čine skoro četvrtinu, što je lošije od proseka zemalja EU [16].

Kao i u velikom broju zemalja regiona i šire, žene su dominirale u profesiji medicinskih sestara u odnosu na medicinske tehničare, u svim godinama posmatranog perioda. To se posebno odnosi na medicinske sestre ginekološko-akušerskog smera, gde su isključivo zastupljene žene. Ipak, kako je u posmatranoj dekadi potražnja ovih profila u porastu i kako se poboljšavaju uslovi rada, broj angažovanih izvršilaca muškog pola konstantno raste. Posledično, pandemija izazvana Kovidom 19 u Crnoj Gori nije produbila postojeći jaz i nejednakost u zastupljenosti polova, kao što je bio slučaj u drugim zemljama [17].

Obrazovna struktura zaposlenih medicinskih sestara i tehničara se u posmatranoj dekadi promenila, pa sada petina medicinskih sestara i tehničara koji su zaposleni u zdravstvenim ustanovama ima diplomu više ili visoke škole. Tome je doprinela ekspanzija edukativnih programa: osnovnih (Visoka medicinska škola i Primenjena fizioterapija), specijalističkih i master studija (Zdravstvena nega i Fizioterapija) na državnom medicinskom fakultetu, koje mogu upisati medicinske sestre i tehničari sa završenim srednjoškolskim obrazovanjem.

Pitanje jednakosti raspodele medicinskih sestara i tehničara je od posebnog značaja za obezbeđivanje dostupnosti i pristupačnosti zdravstvene zaštite. U Crnoj Gori postoji relativno visok nivo jednakosti distribucije medicinskih sestara i tehničara u odnosu na stanovništvo po opštinama. Tome je verovatno doprinelo već pomenuto povećanje stopa obezbeđenosti. Slična istraživanja (ne)jednakosti raspodele raznih profila zdravstvenih radnika sprovedena su u raznim zemljama. Istraživanje koje je sprovedeno u Kini pokazalo je da je došlo do pogoršanja u ostvarenom nivou jedna-

level. The increase in the number of employed nurses and technicians helped improve the nurse-to-doctor ratio, which had been declining following the reform activities of the previous period. As a result, this ratio approached the EU average from 2020, which was slightly over two nurses/technicians per doctor [12,14], and was higher than the average in several countries in the region [15].

Nurses and technicians are predominantly employed in hospital healthcare, with approximately one-third working in outpatient care. The growth trends over the past decade indicate a slight shift toward strengthening the labor supply of nurses and technicians in hospital settings. The majority of nurses and technicians are middle-aged, reflecting the workforce expansion, particularly during the pandemic years. However, nearly a quarter of them are aged 55 and older, which is higher than the average in EU countries and presents a challenge for the workforce sustainability [16].

As in many countries in the region and beyond, women have consistently dominated the nursing profession over medical technicians throughout the observed period. This is particularly true for gynecological-obstetrical nurses, where the profession is exclusively female. However, as the demand for these roles increased over the observed decade and working conditions improved, the number of male nurses and technicians steadily grew. As a result, the COVID-19 pandemic in Montenegro did not exacerbate the existing gender gap or inequality in the profession [17].

The educational structure of employed nurses and technicians has evolved over the past decade, with one-fifth of those working in healthcare institutions now holding a higher or advanced degree. This change was supported by the expansion of educational programs, including basic courses (Medical College and Applied Physiotherapy), as well as specialized and master's studies (Nursing and Physiotherapy) at the state medical faculty. These programs are accessible to nurses and technicians who have completed their high school education.

The issue of equitable distribution of nurses and technicians is crucial for ensuring the availability and accessibility of healthcare. In Montenegro, there is a relatively high level of equality in the distribution of nurses and technicians across municipalities in relation to the population. The previously mentioned increase in the distribution of nursing workforce likely contributed to this trend. Similar studies examining the (in)equality in the distribution of various healthcare worker profiles have been conducted in several countries. Research conducted in China has shown a

kosti raspodele medicinskih sestara, na osnovu opadanja vrednosti Gini koeficijenta [18]. Istraživanja sprovedena u Poljskoj i Mongoliji utvrdila su relativno dobru jednakost distribucije medicinskih sestara u odnosu na populaciju, na osnovu vrednosti Gini koeficijenta u periodu od 2010. do 2017. godine [19,20].

Treba sprovesti dodatna istraživanja kako bi se ispitale zdravstvene potrebe stanovništva, pošto se u Crnoj Gori ne sprovode takva redovna istraživanja. Za proces planiranja, važno bi bilo sprovesti i istraživanja o migracijama medicinskih sestara i tehničara u zemlje regiona i EU, budući da su navedeni podaci oskudni ili ne postoje. Kvalitetni podaci o ljudskim resursima neophodan su preduslov za vođenje politike zasnovane na dokazima, pa je od suštinske važnosti da zdravstvene vlasti prepoznaju značaj uspostavljanja mehanizma koji će obezbediti ažurnu i potpuniju evidenciju.

Ovo istraživanje nije obuhvatilo medicinske sestre i tehničare koji rade u privatnom sektoru, a koji je poslednjih godina u ekspanziji u Crnoj Gori, posebno nakon pandemije izazvane Kovidom 19. Takođe nisu obuhvaćene medicinske sestre i tehničari zaposleni u državnim zatvorima, policiji, vojnim, predškolskim i ustanovama socijalne zaštite. Međutim, ovde treba uzeti u obzir činjenicu da ne mali broj medicinskih sestara koje su zaposlene u državnim zdravstvenim ustanovama, imaju istovremeno dopunski radni angažman u privatnim ustanovama. Medicinske sestre i tehničari koji rade u jedinicama za hitnu medicinsku pomoć u svim opštinama nisu obuhvaćeni prilikom izračunavanja Gini koeficijenta.

ZAKLJUČAK

U proteklom periodu desile su se značajne promene u segmentu zdravstvene radne snage koji čine medicinske sestre i tehničari: došlo je do porasta u ukupnom broju, popravljen je odnos medicinskih sestara u odnosu na lekare, kao i među polovima zastupljenim u profesiji. Došlo je do poboljšanja u domenu obrazovanja medicinskih sestara i tehničara, a smanjene su nejednakosti u njihovoj raspodeli u odnosu na stanovništvo po opštinama. Navedene promene bi mogle da budu u velikoj meri povezane sa odgovorom zemlje na krizu uzrokovanu pandemijom usled Kovida 19. Ipak, stopa obezbeđenosti je u poređenju sa prosekom zemalja EU i dalje relativno niska, kao i ideo sestara sa visokim obrazovanjem, a raspoloživi podaci o ljudskim resursima su ograničeni. Kako bi se mogle donositi adekvatne odluke zasnovane na dokazima, potrebno je raspolagati što potpunijim i ažurnijim podacima o ljudskim resursima na nivou čitavog zdravstvenog sistema.

Sukob interesa: Nije prijavljen.

decline in the level of equality in the distribution of nurses, as evidenced by a decrease in the Gini coefficient [18]. Research conducted in Poland and Mongolia found a relatively high level of equality in the distribution of nurses relative to the population, based on the Gini coefficient, during the period from 2010 to 2017 [19,20].

Additional research is needed to assess the health needs of the population, as such regular studies are not conducted in Montenegro. For effective planning, it is also crucial to investigate the migration patterns of nurses and technicians to regional and EU countries, as data on this topic is either scarce or nonexistent. Quality data on human resources is a critical prerequisite for evidence-based policymaking. Therefore, it is essential for health authorities to recognize the importance of establishing mechanisms that ensure up-to-date and comprehensive records.

This research did not include nurses and technicians working in the private sector, which has been expanding in Montenegro in recent years, particularly after the COVID-19 pandemic. It also excluded those employed in state prisons, the police, military, pre-school, and social protection institutions. However, it is important to consider that a significant number of nurses employed in state healthcare institutions also work part-time in private institutions. Additionally, nurses and technicians working in emergency medical aid units across all municipalities are not included in the calculation of the Gini coefficient.

CONCLUSION

In recent years, there have been significant changes in the health workforce segment comprising nurses and technicians: the total number has increased, the nurse-to-doctor ratio has improved, and there has been greater gender representation within the profession. There has been significant progress in the education of nurses and technicians, and inequalities in their distribution across municipalities have been reduced. These changes are largely attributed to the country's response to the crisis caused by the COVID-19 pandemic. However, the density of nursing workforce remains relatively low compared to the EU average, as does the proportion of nurses with higher education, while available data on human resources remains limited. To make informed decisions based on evidence, it is essential to have comprehensive and up-to-date data on human resources across the entire health system.

Conflict of interest: None declared.

LITERATURA / REFERENCES

- World Health Organization. Global strategy on human resources for health: workforce 2030 [Internet]. Geneva: World Health Organization; 2016 [cited 2024 August, 21]. 61 p. Available from: <https://iris.who.int/bitstream/handle/10665/250368/9789241511131-eng.pdf?sequence=1>
- Boniol M, Kunjumen T, Nair TS, Siyam A, Campbell J, Diallo K. The global health workforce stock and distribution in 2020 and 2030: a threat to equity and 'universal' health coverage? *BMJ Glob Health*. 2022 Jun;7(6):e009316. doi: 10.1136/bmjgh-2022-009316.
- Cvejanov Kezunović L, Drecun M, Švab I. Primary care reform in Montenegro. *Zdr Varst*. 2013 Dec;52(4):247-54. doi: 10.2478/sjph-2013-0025.
- Šćepanović L. Health personnel and the reform of primary health care in Montenegro. *Srpski medicinski časopis Lekarske komore*. 2023;4(1):27-40. doi: 10.5937/smlk4-42596.
- Ministarstvo zdravlja Crne Gore. Master plan razvoja zdravstva Crne Gore 2015–2020 [Internet]. Podgorica: Ministarstvo zdravlja Crne Gore; 2015 Aug [cited 2024 August, 16]. 61 p. Available from: <https://www.gov.me/dokumenta/fde2ae2d-2a46-44e2-bf7c-06fdf35f4998>
- Vlada Crne Gore – Ministarstvo zdravlja. Plan ljudskih resursa u zdravstvu u periodu 2013–2022. godine [Internet]. Podgorica: Vlada Crne Gore – Ministarstvo zdravlja; 2013 Feb [cited 2024 August, 21]. 71 p. Available from: <https://www.gov.me/dokumenta/8155b409-453c-479e-af20-396c92778a8b>
- Ministarstvo zdravlja Crne Gore. Zakon o zdravstvenoj njezi pacijenata, „Službeni list CG” br. 25/2010 [Internet]. Available from: <https://www.gov.me/dokumenta/b732b99d-0134-45bc-a1fb-f47541443f24>
- Ministarstvo zdravlja Crne Gore. Zakon o zdravstvenoj zaštiti „Službeni list CG”, br. 3/2016, 39/2016, 2/2017, 44/2018, 24/2019 – dr. zakoni, 82/2020 i 8/2021 [Internet]. Available from: <https://www.gov.me/clanak/zakon-o-zdravstvenoj-zastiti>
- Brown MC. Using Gini-style indices to evaluate the spatial patterns of health practitioners: theoretical considerations and an application based on Alberta data. *Soc Sci Med*. 1994 May;38(9):1243-56. doi: 10.1016/0277-9536(94)90189-9.
- Kharazmi E, Bordbar N, Bordbar S. Distribution of nursing workforce in the world using Gini coefficient. *BMC Nurs*. 2023 May 5;22(1):151. doi: 10.1186/s12912-023-01313-w.
- Castillo-Salgado C, Schneider C, Loyola E, Mujica O, Roca A, Yerg T. Measuring health inequalities: Gini coefficient and concentration index. *Epidemiol Bull* [Internet]. 2001 Mar [cited 2024 August, 5];22(1):3-4. Available from: https://www3.paho.org/english/sha/be_v22n1-Gini.htm
- OECD/European Union. Health at a Glance: Europe 2022: State of Health in the EU Cycle [Internet]. Paris: OECD Publishing; 2022 Dec [cited 2024 July,13]. 219 p. Available from: <https://doi.org/10.1787/507433b0-en>
- Buchan J, Catton H, Shaffer F. Sustain and retain in 2022 and beyond. The global nursing workforce and the COVID-19 pandemic [Internet]. Philadelphia: International Centre on Nurse Migration; 2022 [cited 2024, July 17]. 71 p. Available from: <https://www.icn.ch/sites/default/files/2023-04/Sustain%20and%20Retain%20in%202022%20and%20Beyond-%20The%20global%20nursing%20workforce%20and%20the%20COVID-19%20pandemic.pdf>
- Drennan VM, Ross F. Global nurse shortages-the facts, the impact and action for change. *Br Med Bull*. 2019 Jun 19;130(1):25-37. doi: 10.1093/bmb/ldz014.
- Janković Z, Nešković A, Budić B. rovision of nurses in the Republic of Serbia during 2000–2016. *Zdravstvena zaštita*. 2018;47(3):1-12. doi: 10.5937/ZZ1803001J.
- World Health Organization Regional Office for Europe. Health and care workforce in Europe: time to act [Internet]. Copenhagen: WHO Regional Office for Europe 2022 Sep [cited 2024, August 15]. 205 p. Available from: <https://www.who.int/europe/activities/building-sustainable-and-fit-for-purpose-workforce>
- World Economic Forum Website [Internet]. What's needed now to protect health workers: WHO COVID-19 briefing. Geneva: World Economic Forum; 2020 Apr 10 [cited 2024 August 7]. Available from: <https://www.weforum.org/stories/2020/04/10-april-who-briefing-health-workers-covid-19-ppe-training/>
- Lu H, Hou L, Zhou W, Shen L, Jin S, Wang M, et al. Trends, composition and distribution of nurse workforce in China: a secondary analysis of national data from 2003 to 2018. *BMJ Open*. 2021 Oct 27;11(10):e047348. doi: 10.1136/bmjopen-2020-047348.
- Erdenee O, Paramita SA, Yamazaki C, Koyama H. Distribution of health care resources in Mongolia using the Gini coefficient. *Hum Resour Health*. 2017 Aug 29;15(1):56. doi: 10.1186/s12960-017-0232-1.
- Rój J. Inequality in the distribution of healthcare human resources in Poland. *Sustainability*. 2020;12(5):2043. doi: 10.3390/su12052043.

EXPLORING THE ASSOCIATION BETWEEN NARCISSISTIC PERSONALITY DISORDER AND SOCIAL MEDIA USE

Lejla Imamović Lerić¹, Indira Husić²

¹ "Fakulteta za organizacijske studije", Novo Mesto, Slovenija

¹ Faculty of Organisation Studies, Novo Mesto, Slovenia

² Univerzitet „Džemal Bijedić“, Mostar, Bosna i Hercegovina

² University Džemal Bijedić, Mostar, Bosnia and Herzegovina

SAŽETAK

Uvod/Cilj: Narcisoidni poremećaj ličnosti je sve primetniji u modernom vremenu. Sve je više onih u društvu kojima vlastito „ja“ predstavlja odskočnu dasku ili prepreku za sopstveno napredovanje. Postavlja se pitanje da li i u kojoj meri je narcisoidni poremećaj ličnosti povezan sa upotrebom društvenih mreža. Društvene mreže su postale deo svakodnevnice, kako mladih, tako i starijih osoba. Na društvenim mrežama se pokušava prikazati odraz svakodnevnice koji često predstavlja iluziju koja zapravo ne postoji. Dakle, na društvenim mrežama se predstavlja lažna slika, daje se lažni sjaj, pokušava se prikazati ono što ne postoji, u želji da se drugi zadive i pomisle da je autor sadržaja u nekoj meri bolji ili važniji, odnosno uspješniji od njih. Rad pokušava da dovede u vezu narcisoidni poremećaj ličnosti i upotrebu društvenih mreža, kako bi se ustanovilo da li su ove dve varijable povezane.

Materijali i metode: Osnovne metode primenjene u ovom istraživanju su metoda analize i sinteze, metoda indukcije i dedukcije, statistička i komparativna metoda. U procesu prikupljanja podataka učestvovalo je 58 studenata, a prilikom istraživanja, korišćeni su Inventar narcisoidne ličnosti, Inventar o prisustvu na društvenim mrežama i usmerenju upotrebe društvenih mreža (akademsko usmerenje, socijalizacija, zabava, informisanje, kompulzivna upotreba), (engl. *Statements of Social Networking Usage Questionnaire*), te su postavljana pitanja opšte prirode (sociodemografska pitanja). Istraživanje je sprovedeno u Sloveniji i Bosni i Hercegovini, u periodu januar–jun 2024. godine.

Rezultati: Utvrđen je veoma nizak stepen korelacije između narcisizma i akademskih svrhe upotrebe društvenih mreža ($r = 0,20$). Utvrđena je srednje jaka korelacija između narcisizma i socijalizacije kao svrhe društvenih mreža ($r = 0,66$). Ustanovljena je veoma slaba korelacija između narcisizma i informativne svrhe upotrebe društvenih mreža, tačnije koeficijent korelacije je iznosio ($r = 0,28$). Najzad, utvrđena je visoka korelacija između narcisizma i zabave kao svrhe upotrebe društvenih mreža – stepen korelacije između ove dve varijable bio je $r = 0,88$.

Zaključak: Rezultati istraživanja ukazuju na postojanje značajne veze između narcisoidnog poremećaja ličnosti i prisustva na društvenim mrežama.

Ključne reči: narcisizam, poremećaj, socijalne mreže, studenti

ABSTRACT

Introduction/Aim: Narcissistic personality disorder has become more and more noticeable in modern times. For an increasing number of people, their ego has become a springboard in society or an obstacle to their progress. The question is whether and to what extent narcissistic personality disorder is related to the use of social media networks. For young and older people alike, social media networks have become a part of everyday life. Social media networks are used in an attempt to show a reflection of everyday life that often represents a non-existent illusion. Therefore, social media networks present a false image, a fake splendor, in an attempt to show what is not there, so as to impress other people and induce them to think that the author of the content is somehow better or more important, i.e., more successful than them. This study attempts to link narcissistic personality disorder and the use of social media networks, in order to determine whether these two variables are related.

Materials and methods: The basic research methods applied in this study are the method of analysis and synthesis, the method of induction and deduction, and the statistical and comparative methods. A total of 58 university students participated in the data collection process. The Narcissistic Personality Inventory and the Statements of Social Networking Usage Questionnaire (i.e., an inventory of social media presence and its purpose – academic, socialization, entertainment, information, compulsive use) were used in the study. Questions of a general nature (for collecting socio-demographic data) were also included. The study was conducted in Slovenia and Bosnia and Herzegovina, from January to June 2024.

Results: A very low degree of correlation was found between narcissism and the academic purpose of using social media networks ($r = 0.20$). A moderately strong correlation was found between narcissism and socialization as the purpose of using social media networks ($r = 0.663$). A very weak correlation was found between narcissism and the informative purpose of using social media networks, more precisely, the correlation coefficient was ($r = 0.28$). Finally, a high level of correlation was found between narcissism and entertainment as the purpose of using social media networks – the degree of correlation between these two variables was $r = 0.88$.

Conclusion: The research results indicate the existence of a significant relationship between narcissistic personality disorder and presence on social media networks.

Keywords: narcissism, disorder, social media networks, university students

Autor za korespondenciju:

Lejla Imamović Lerić

Fakulteta za organizacijske studije

Ulica talcev 3, 8000 Novo Mesto, Slovenija

Elektronska adresa: lejla.imamovicleric@gmail.com

Corresponding author:

Lejla Imamović Lerić

Faculty of Organisation Studies

3 Talcev Street, 8000 Novo Mesto, Slovenia

E-mail: lejla.imamovicleric@gmail.com

Primljeno • Received: June 25, 2024; Revidirano • Revised: November 6, 2024; Prihvaćeno • Accepted: December 11, 2024; Online first: December 25, 2024

DOI: 10.5937/smlk5-51815

UVOD

Upotreba društvenih mreža je postala svakodnevica za većinu ljudi na planeti. Sadržaj koji se objavljuje na društvenim mrežama je veoma raznolik, a njegov uticaj može u velikoj meri da opredeli određene ljude ka određenim aktivnostima. U ovom radu će biti reči o osobama sa narcisoidnim poremećajem ličnosti (NPL), odnosno o takozvanim „narcisima“, i njihovom odnosu prema društvenim mrežama. Osobe sa narcisoidnim poremećajem ličnosti imaju specifične obrasce ponašanja, koji ih, kao takvi, opredeljuju ka određenim aktivnostima, u manjoj ili većoj meri. Prethodna istraživanja ukazuju na to da osobe sa narcisoidnim poremećajem ličnosti koriste društvene mreže u specifične svrhe.

Svrhe upotrebe društvenih mreža možemo podeliti u pet osnovnih kategorija: akademska svrha, svrha socijalizacije, informativna svrha, svrha zabave i kompulzivna upotreba društvenih mreža.

U empirijskom delu rada napravljeno je istraživanje koje se odnosilo na grupu studenata koji su, prema kriterijumima narcisizma – narcisi (ili imaju narcisoidni poremećaj ličnosti), te se analiziralo u koju svrhu ova grupacija najčešće koristi društvene mreže. Kroz koeficijent korelacije, ispitivalo se koja svrha upotrebe društvenih mreža najviše korelira sa narcisizmom.

Narcisoidnost je postala karakteristika koja definiše moderno doba: zanimanje za taj koncept zaokupilo je maštu javnosti, medija i književnosti. Sedamdesetih godina prošlog veka, američki novinar Tom Volf skovao je frazu „the ‘me’ decade“ kako bi opisao porast slavljenja samog sebe, a američki istoričar i društveni kritičar Kristofer Leš je objavio knjigu „Kultura narcisizma“, u kojoj istražuje porast pojave narcisoidnih ličnosti i decadencije. Ovi popularizovani tekstovi praćeni su sve većim akademskim interesovanjem i empirijskim istraživanjima, posebno u područjima psihologije, društvenih nauka i kulturoloških studija [1].

Osnovne karakteristike narcisizma su [2]:

- ♦ evidentna koncentracija na sebe u međuljudskoj razmeni;
- ♦ nedostatak psihološke svesti (videti takođe: *insight, ego syntonic*);
- ♦ poteškoće s empatijom, nemogućnost sagledavanja sveta iz perspektive drugih;
- ♦ poteškoće u razlikovanju sebe od drugih, drugi se sagledavaju kao njihov „produžetak“;
- ♦ iskorišćavanje drugih za sopstvene ciljeve, bez obzira na cenu njihovog delovanja;
- ♦ ranjivost na sramotu ili krivicu;
- ♦ poricanje kajanja i zahvalnosti;
- ♦ iritiranost u odnosu na ljude koji im se ne dive;
- ♦ laskanje ljudima koji im se dive;
- ♦ razmetanje sopstvenim uspesima;

INTRODUCTION

The use of social media networks has become a daily routine for most people worldwide. The content posted on social media is very diverse, and its influence can largely steer certain people towards particular activities. This paper will analyze people with narcissistic personality disorder (NPL) and people known as narcissists, and their attitudes towards social networks. People with narcissistic personality disorder have specific patterns of behavior, which, as such, steer them toward certain activities, to a lesser or greater extent. Previous research indicates that people with narcissistic personality disorder use social media networks for particular purposes.

The different purposes of using social media networks can be divided into five basic categories: academic purpose, socialization purpose, informative purpose, entertainment purpose, and compulsive use of social media networks.

The empirical segment of this study researched a group of university students who, according to the criteria of narcissism, are narcissists (or suffer from narcissistic personality disorder), and analyzed the most common purpose for using social media networks in this group. The correlation coefficient was used to examine which purpose for using social networks correlates with narcissism the most.

Narcissism has become a defining characteristic of the modern age: interest in the concept has captured the public's imagination, the media, and literature. In the 1970s, American journalist Tom Wolfe coined the phrase *the 'me' decade* to describe the rise of self-celebration, and American historian and social critic Christopher Lasch published the book, *The Culture of Narcissism*, wherein he explored the rise in narcissistic personality disorder and decadence. These popularized texts have sparked increasing academic interest and empirical research, especially in the domains of psychology, social sciences, and cultural studies [1].

The basic characteristics of narcissism are [2]:

- ♦ evident concentration on oneself in interpersonal exchanges;
- ♦ lack of psychological awareness (see also *insight, ego syntonic*);
- ♦ difficulty with empathy, inability to see the world from the point of view of others;
- ♦ difficulty in distinguishing oneself from others, the others are seen as their “extension”;
- ♦ exploitation of others for their own goals, with no consideration of the price of their action;
- ♦ vulnerability to shame or guilt;
- ♦ denial of remorse and gratitude;
- ♦ irritation towards people who do not admire them;

- ♦ predstavljanje nepostojećih uspeha;
- ♦ razmetanje sposobnostima ili pretvaranje da se poseduju nepostojeće sposobnosti;
- ♦ oholost izražena govorom tela.

Narcisoidni poremećaj ličnosti se može opisati kao prožimajući obrazac grandioznosti, potrebe za divljenjem i nedostatka empatije. Devet kriterijuma koji karakterišu NPL su sledeći: grandiozni osećaj vlastite važnosti i propratne grandiozne fantazije, uverenje u sopstvenu posebnost i jedinstvenost, potreba za pažnjom punom divljenja, osećaj povlašćenosti (očekivanje posebnog tretmana i prava na izuzetak), izrabljivanje (iskorišćavanje drugih ljudi), arogancija i oholost, nedostatak empatije (tj. nevoljnost prepoznavanja ili poistovećivanja s osećajima i potrebama drugih), te zavist prema drugima ili uverenje da im drugi zavide.

Obeležja povezana sa narcisoidnim poremećajem ličnosti su ranjivo samopoštovanje – osećaj stida, osetljivosti i intenzivne reakcije poniženja, praznine ili prezira na kritiku ili poraz, kao i kršenje radne etike koje proizlazi iz poteškoća u tolerisanju kritike ili takmičenja [3]. Ovaj poremećaj uključuje tri elementa: preuveličana svest o sopstvenom značaju, nedostatak topline ili empatije u odnosima prema drugim ljudima, te primena raznih strategija za održavanje preuveličanog mišljenja o sebi. Narcisizam nije povezan sa viđenjem sebe kao brižnijeg i ljubaznijeg od drugih [4].

Dijagnostičke nedoumice oko narcisoidnog poremećaja ličnosti se javljaju zbog vrlo varijabilne prezentacije i širokog raspona ozbiljnosti poremećaja koja može karakterisati narcisoidnu patologiju. Pojedinci sa narcisoidnim poremećajem ličnosti mogu biti grandiozni ili mrzeti sami sebe, ekstrovertni ili društveno izolovani, majstori svog zanata ili nesposobni da zadrže stalni posao, uzorni građani ili skloni antisocijalnim aktivnostima [5]. Savremene konceptualizacije patološkog narcisizma naglašavaju njegove manifestacije u grandioznosti i ranjivosti. Narcisoidna grandioznost povezana je sa osećanjima privrženosti, vlastite važnosti i sa izrabljivačkim ponašanjem. Pojedinci sa visokom grandioznošću verovatno će biti otvoreno neskromni, promovisaće sami sebe i prikazivaće se boljim nego što jesu. Narcisoidna ranjivost povezuje se sa osećajem povlašćenosti i antagonizmom prema drugima u svojoj okolini, ali se takođe karakteriše stidom i negativnom emocionalnošću. Stoga, umesto da se odražava u ponašanju traženja nagrade, poput grandioznosti, ranjivost se odražava u motivima kao što je izbegavanje neprijatnosti, i ima tendenciju da bude široko povezana sa drugim oblicima patologije ličnosti [6].

Sa druge strane, klasični poremećaj ličnosti je definicija koja se koristi za zajedničke fizičke, mentalne i duhovne karakteristike [7]. Većina definicija

- ♦ flattery towards people who admire them;
- ♦ ostentation of one's successes;
- ♦ fiction of non-existent successes;
- ♦ ostentation or pretense of competence;
- ♦ haughtiness expressed with body language.

Narcissistic personality disorder can be described as a pervasive pattern of grandiosity, a need for admiration, and a lack of empathy. The nine criteria that characterize people with NPL are as follows: grandiose sense of self-importance and accompanying grandiose fantasies, belief in one's specialness and uniqueness, need for excessive admiration, sense of entitlement-privilege (expectation of special treatment and the right to exception), exploitation (taking advantage of other people), arrogance and haughtiness, lack of empathy (i.e. reluctance to recognize or identify with the feelings and needs of others), and envy of others or belief of being envied by others.

Features associated with narcissistic personality disorder include vulnerable self-esteem – feelings of shame, sensitivity, and intense reactions of humiliation, emptiness, or contempt to criticism or defeat, as well as poor work ethics, arising from difficulties in tolerating criticism or competition [3]. This disorder includes three elements: an exaggerated sense of self-importance, a lack of warmth or empathy in relationships with other people, and the use of various strategies to maintain an exaggerated opinion of oneself. Narcissism is not associated with seeing oneself as more caring or kinder than others [4].

Diagnostic dilemmas regarding narcissistic personality disorder stem from the highly variable presentation and a wide range of disorder severity that can characterize narcissistic pathology. Individuals with narcissistic personality disorder may be grandiose or self-loathing, extroverted or socially isolated, masters of their trade or incapable of holding down a steady job, exemplary citizens or prone to antisocial activities [5]. Contemporary conceptualizations of pathological narcissism emphasize its manifestations in grandiosity and vulnerability. Narcissistic grandiosity is associated with feelings of attachment, self-importance, and exploitative behavior. Individuals exhibiting a high level of grandiosity are likely to be overtly immodest, self-promoting, and prone to self-aggrandizement. Narcissistic vulnerability is associated with a sense of entitlement and antagonism towards other people but is also characterized by shame and negative emotionality. Thus, rather than being reflected in reward-seeking behaviors such as grandiosity, vulnerability is reflected in motives such as avoidance of unpleasantness and tends to be broadly associated with other forms of personality pathology [6].

poremećaja ličnosti naglašava hroničnu, dugotrajnu prirodu karakteristika i obrazaca reagovanja na neprijatnost, koji su često ograničene varijabilnosti, i često se primenjuju bez obzira na prikladnost kontekstu. Na primer, u „Dijagnostičkom i statističkom priručniku za mentalne poremećaje“ (engl. *Diagnostic and Statistical Manual of Mental Disorders – DSM*), poremećaji ličnosti su opisani kao obrazac unutrašnjeg iskustva i ponašanja koji odstupa od kulturnih normi. Ovi obrasci opažanja, odnosa i razmišljanja o okolini i sebi su prožimajući, nefleksibilni i stabilni tokom vremena i za posledicu imaju probleme ili oštećenje u funkcionisanju. Osobe sa poremećajem ličnosti imaju tendenciju da se nađu u „začaranim krugovima“ u kojima nastaju upravo ona iskustva koja pokušavaju da izbegnu, a ti obrasci počinju da definišu iskustvo tog pojedinca. Način na koji pojedinac misli, oseća, deluje i odnosi se prema drugima direktno ograničava njegovu sposobnost za rad, postizanje ciljeva i uživanje u intimnim odnosima [5]. Narcisoidni pacijenti pokušavaju da o sebi zadrže sliku savršenstva i lične nepobedivosti i da projektuju takvu sliku o sebi i drugima. Fizička bolest može da razbije ovu iluziju, a pacijent može izgubiti osećaj sigurnosti svojstven kohezivnom doživljaju sebe. Ovaj gubitak ubrzava panično osećanje da se „moj svet raspada u paramparčad“, a pacijent ima osećaj lične fragmentacije [8].

Poslednjih godina, upotreba društvenih mreža je postala svetski fenomen. Upotreba društvenih mreža je nesumnjivo jedna od aktivnosti koje oduzimaju najviše slobodnog vremena u mnogim zemljama. Preko društvenih mreža, pojedinci mogu da se, između ostalog, povežu sa svojim prijateljima i pratiocima, da izraze emocije, označe svoju lokaciju, te podele fotografije i video zapise. Ovaj proces omogućava pojedincima trenutno i živo izražavanje sebe. Crte ličnosti mogu da utiču na preterano i patološko korišćenje društvenih mreža. Osim toga, otkriveno je da, po svoj prilici, zavisnost od društvenih mreža predviđa narcisoidne crte ličnosti. U manjini slučajeva, aktivnosti na društvenim mrežama mogu uzrokovati negativne društvene i psihološke učinke, a neki tvrde da ekstremno problematično korišćenje društvenih mreža može da izazove zavisnost. Zavisnost od društvenih mreža može dovesti do negativnih ishoda na društvenom, profesionalnom i/ili obrazovnom planu te je povezana sa različitim oblicima psihopatologije, akademskim problemima i usamljenošću.

Ove posledice su navele istraživače na teoretisanje i empirijsko ispitivanje prirode zavisnosti od društvenih mreža i povezanih varijabli [9]. Dokazano je da društvene mreže imaju značajno dejstvo na samopouzdanje svojih korisnika. Psiholozi su opsežno proučavali potre-

On the other hand, classic personality disorder is a definition used for common physical, psychological, and spiritual characteristics [7]. Most definitions of personality disorders emphasize the chronic, long-lasting nature of distress response characteristics and patterns, which are often of limited variability, and are applied regardless of contextual appropriateness. For example, in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), personality disorders are described as a pattern of inner experience and behavior that deviates from cultural norms. These patterns of perceiving, relating, and thinking about the environment and oneself are pervasive, inflexible, and stable over time, and result in problems or impairment in functioning. Individuals with a personality disorder tend to find themselves in “vicious circles” where the very experiences that they are trying to avoid occur, and these patterns begin to define this individual’s experience. How an individual thinks, feels, acts, and relates to others directly limits their ability to work, achieve goals, and enjoy sexual relations [5]. Narcissistic patients try to maintain an image of perfection and invincibility and to project such an image of themselves onto others. Physical illness can shatter this illusion, and the patient can lose the sense of security inherent in a cohesive experience of self. This loss accelerates a sense of panic wherein these individuals feel: “My world is falling apart”, and the patient has a sense of personal fragmentation [8].

In recent years, the use of social media networks has become a worldwide phenomenon. The use of social media networks is undoubtedly one of the activities that take up the greatest amount of free time in many countries. Through social media networks, individuals can, among other things, connect with their friends and followers, express emotions, tag their location, and share photos and videos. This process allows individuals to express themselves instantly and vividly. Personality traits can influence excessive and pathological use of social media networks. In addition, social media addiction was found to predict narcissistic personality traits. In a minority of cases, social media activity can cause negative social and psychological effects, and some argue that extremely problematic social media use can be addictive. Social media addiction can lead to negative social, professional, and/or educational outcomes and is associated with various forms of psychopathology, academic problems, and loneliness.

These effects have led researchers to theorize and empirically examine the nature of social network addiction and related variables [9]. It has been proven that social media networks have a significant effect on the self-confidence of their users. Psychologists have extensively studied the need to belong, and some have

bu za pripadanjem, a neki postuliraju da društvene mreže pružaju prikladan način da se uklopite među druge. Pripadnost nekoj grupaciji podstiče razvoj kolektivnog samopoštovanja koje socijalni psiholozi opisuju kao aspekt samopoimanja pojedinca proistekao iz njegove svesti o pripadnosti društvenoj grupaciji, zajedno sa vrednošću i emocionalnim značenjem koji se tom članstvu pridaju. U tom smislu, upotreba društvenih mreža mogla bi da poveća nivo samopoštovanja [10].

Prva studija o odnosu između upotrebe društvenih mreža i narcizma pokazala je da je grandiozni narcizam korisnika, koji su sami prijavili, bio značajno povezan s količinom njihovih društvenih interakcija (kompozitna mera broja prijatelja i broja objava na tzv. „zidu“), ali ne i sa količinom informacija navedenih u odeljku „O sebi“. Štaviše, istraživači su ocenili opseg samopromotivnog sadržaja (uglavnom samopromocije u slikama i citatima) na Fejsbuk stranicama ispitanika i povezali te ocene s grandioznim narcizmom koji su oni sami prijavili. Nekoliko indikatora sadržaja Fejsbuk profila, kao što su citati za samopromociju, dali su pozitivan odnos s narcisoidnošću koju su ispitanici sami prijavili, dok drugi (npr. slike za samopromociju) nisu. Ovi rezultati upućuju na to da se čini da narcise posebno privlače aktivnosti koje jačaju njihov osećaj sopstvene važnosti i pružaju im mogućnost da se drugima predstave u povoljnom svetlu. Nadalje, narcisi teže brojnoj publici prikupljanjem velikog broja Fejsbuk prijatelja i čestim ažuriranjem statusa koji odražavaju njihovu grandioznu sliku o sebi.

Kada je ova temeljna studija objavljena, Fejsbuk je imao oko 29 miliona aktivnih korisnika – što je oko 2% njegovog trenutnog aktivnog članstva.

U međuvremenu je sprovedeno opsežno istraživanje o vezi između upotrebe društvenih mreža i narcisoidnosti, uporedo sa značajnom medijskom pokrivenošću ove teme. Do sada su u različitim disciplinama sprovedena istraživanja koja su ostala donekle neuverljiva: dok su mnoge studije potkrepile ideju o pozitivnom odnosu između grandioznog narcizma i broja kontakata na društvenim mrežama, druge studije nisu pronašle nikakvu povezanost ili su čak ustanovile obrnute veze. Slično tome, dok neke opservacione studije imaju tendenciju da naglašavaju vezu između narcizma i upotrebe društvenih mreža, drugi ocenjuju da ta veza nije uspostavljena [11].

Pojedinci koriste društvene mreže kako bi istakli sopstveni značaj, privukli pažnju i obezbedili poštovanje i status. Oni postavljaju atraktivne fotografije i dele najzanimljivije podatke o sebi da bi ovo ostvarili.

Intrigantan je i odnos između narcisoidnosti i ponašanja pri slikanju tzv. „selfija“. U studiji sprovedenoj kako bi se ispitao ovaj odnos, autori su otkrili da su ispitanici

postulated that social media networks provide a convenient method of fitting in with others. Belonging to a group encourages the development of collective self-esteem, which social psychologists describe as an aspect of an individual's self-concept derived from his/her awareness of belonging to a social group, along with the value and emotional significance attached to that membership. In this sense, the use of social media networks could increase a person's level of self-esteem [10].

The first study on the relationship between social media use and narcissism found that users' self-reported grandiose narcissism was significantly linked to the number of their social interactions (a composite measure of the number of friends and number of posts on the user's wall), but not to the amount of information listed in the "About" section. Furthermore, the researchers rated the extent of self-promotional content (mainly self-promotion through pictures and quotes) posed on the subjects' Facebook pages. They correlated those ratings with self-reported grandiose narcissism. Several indicators of Facebook profile content, such as self-promotional quotes, yielded a positive relationship with the subjects' self-reported narcissism, while others (e.g., self-promotional pictures) did not. These results suggest that narcissists appear to be particularly attracted to activities that enhance their sense of self-importance and provide them with the opportunity to present themselves to others in a favorable light. Furthermore, narcissists strive for a large audience by collecting large numbers of Facebook friends and frequently updating statuses that reflect their grandiose self-image. When this seminal study was published, Facebook had about 29 million active users – about 2% of its current active membership.

In the meantime, extensive research has been conducted on the link between social media use and narcissism and this topic has received significant media coverage. Thus far, research has been conducted in various disciplines, with somewhat inconclusive results. Namely, while many studies support the idea of a positive relationship between grandiose narcissism and the number of contacts on social networks, other studies have found no connection or have even found reverse connections. Similarly, while some observational studies tend to emphasize the link between narcissism and social media use, others find that no link has been established [11].

Individuals use social media to emphasize their self-importance, attract attention, and secure respect and status. They post flattering photos and share the most interesting information about themselves to achieve this.

The relationship between narcissism and behavior when taking a selfie is also intriguing. In a study con-

sa visokim stepenom narcisoidnosti obraćali više pažnje na komentare i tzv. „lajkove“ drugih na društvenim mrežama i više pratili tuđe selfije. Drugo istraživanje pokazalo je da je deljenje selfija povezano s narcizmom samo kod muških učesnika, ali ne i kod ženskih. U drugoj studiji istraživana je veza između objavljivanja selfija i tri aspekta narcizma (vođstvo / autoritet, preterano eksponiranje, autoritet / izrabljivanje). Prema dobijenim rezultatima, utvrđena je pozitivna značajna veza između učestalosti deljenja selfija i vođstva / autoriteta, preteranog eksponiranja, kao i autoriteta / izrabljivanja [12].

MATERIJALI I METODE

Naše istraživanje uticaja narcisoidne ličnosti na objave na društvenim mrežama izvršeno je na uzorku od 58 studenata fakulteta različitih smerova u Sloveniji i Bosni i Hercegovini, u periodu januar - jun 2024. godine. Kriterijumi uzorkovanja su bili:

- ♦ da je osoba student;
- ♦ da osoba ima profil na društvenim mrežama: Fejsbuk, Tviter, Instagram, Tiktok;
- ♦ da osoba iskazuje određene elemente narcizma.

Istraživanje je izvršeno putem platforme *Google Survey*, a upitnik je sadržao sledeće elemente:

- ♦ Inventar narcisoidne ličnosti – najrasprostranjeniji instrument za merenje individualnih razlika u narcizmu u nekliničkoj populaciji. Iako su stavke samoprocene za NPL izvedene iz kriterijuma za narcisoidni poremećaj ličnosti definisanih u DSM-III, ova ponašanja zapravo odražavaju narcisoidnost kao normalnu osobinu ličnosti, osim ako se ne pokazuju u ekstremnim oblicima. Inventar je izvorno uključivao 223 stavke, a kasnije je sažet kao inventar od 40 stavki koji se uglavnom koristi u istraživanju narcisoidnih osoba ličnosti već više od dve decenije [13]. Ovaj merni instrument sadrži elemente koji se mere Likertovom skalom od 1 do 5 (1 – najniža ocena; 5 – najviša ocena). Pored navedenog inventara, korišćena su i određena dihotomna pitanja koja se odnose na narcizam.
- ♦ Inventar o prisustvu na društvenim mrežama i usmerenju upotrebe društvenih mreža (akademsko usmerenje, socijalizacija, zabava, informisanje, kompulzivna upotreba), (engl. *Statements of Social Networking Usage Questionnaire*) [14]. Pored navedenog inventara, korišćena su i određena dihotomna pitanja ili pitanja višestrukog izbora koja se odnose na upotrebu društvenih mreža.
- ♦ Pitanja koja se odnose na uzorak i opšta (sociodemografska) pitanja.

Istraživanje je imalo za cilj da ukaže na to koliko narcisoidni poremećaj ličnosti ima uticaja na upotrebu društvenih mreža, kao i u koje svrhe (akademska svrha, socijalizacija, zabava, informisanje, kompulzivna upo-

ducted to examine this relationship, the authors found that subjects with high levels of narcissism paid more attention to comments and other people's "likes" on social media and followed other people's selfies more. Another study found that sharing selfies was associated with narcissism only in male participants, but not in female participants. Another study investigated the relationship between selfie posting and three aspects of narcissism (leadership / authority, magnificent exhibitionism, authority / exploitation). According to the obtained results, a positive significant relationship was found between the frequency of sharing selfies and leadership / authority, magnificent exhibitionism, as well as authority / exploitation [12].

MATERIALS AND METHODS

Our study on the influence of narcissistic personality on social media posts was conducted in Slovenia and Bosnia and Herzegovina, from January to June 2024, on a sample of 58 university students majoring in different areas. The sampling criteria were as follows:

- ♦ that the person is a university student;
- ♦ that the person has a profile on social media networks: Facebook, Twitter, Instagram, TikTok;
- ♦ that the person exhibits certain elements of narcissism.

The study was conducted via *Google Survey*, with the questionnaire containing the following elements:

- ♦ The Narcissistic Personality Inventory – the most widely used instrument for measuring individual differences in narcissism in a non-clinical population. Although the self-evaluation items for NPI are derived from the criteria for narcissistic personality disorder defined in DSM-III, these behaviors, in fact, reflect narcissism as a normal personality trait, unless manifested in extreme forms. The inventory originally included 223 items and was later condensed to a 40-item inventory that, for over two decades, has been predominantly used for researching narcissistic personality traits [13]. This measuring instrument contains elements measured on a Likert scale ranging from 1 to 5 (1 – the lowest score; 5 – the highest score). In addition to the aforementioned inventory, certain dichotomous questions related to narcissism were also used.
- ♦ The Statements of Social Networking Usage Questionnaire – (i.e., an inventory of social media presence and its purpose – academic, socialization, entertainment, information, compulsive use) [14]. In addition to the above inventory, certain dichotomous or multiple-choice questions related to the use of social networks were also used.
- ♦ Questions related to the sample and general (socio-demographic) questions.

treba) osobe sa narcisoidnim poremećajem ličnosti najčešće koriste društvene mreže.

U zavisnosti od tipa varijabli i normalnosti raspodele, deskripcija podataka je prikazana kao n (%), aritmetička sredina (A) $\pm$ standardna devijacija (SD) ili medijana ($min-max$). Za procenu povezanosti korišćen je Pearsonov koeficijent korelacije. Statističke hipoteze su testirane na nivou statističke značajnosti (alfa nivo) od 0,05. Svi podaci su obrađeni u softverskom paketu IBM SPSS Statistics 22 (SPSS Inc., Chicago, IL, USA).

REZULTATI EMPIRIJSKOG ISTRAŽIVANJA

Na samom početku prezentacije rezultata istraživanja prikazani su podaci koji se odnose na uzorak.

Prilikom analize podataka prikupljenih na datom uzorku, došlo se do rezultata predstavljenih u Tabeli 1. U procesu istraživanja učestvovalo je 58 ispitanika. Od ukupnog broja ispitanika, 34,4% su bili muškarci, dok

The study aimed to determine how much narcissistic personality disorder influences the use of social media networks, as well as to identify the purposes (academic, socialization, entertainment, information, compulsive use) for which people with narcissistic personality disorder most often use social networks.

Depending on the type of variables and the normality of the distribution, the data description is presented as n (%), arithmetic mean (A) $\pm$ standard deviation (SD), or median ($min-max$). Pearson's correlation coefficient was used to assess the association. Statistical hypotheses were tested at the statistical significance level (alpha level) of 0.05. All data were processed with the software package IBM SPSS Statistics 22 (SPSS Inc., Chicago, IL, USA).

RESULTS OF EMPIRICAL RESEARCH

The data related to the sample are presented at the very beginning of the study results presentation.

Tabela 1. Sociodemografski podaci i podaci koji se odnose na strukturu uzorka

Variable / Variables	<i>n</i>	%
Pol / Sex		
Muški / Male	20	34.4
Ženski / Female	38	65.6
Godine / Age (years)		
18-20 / 18-20	41	70
21-25 / 21-25	12	20
preko 25 / over 25	6	10
Da li ste student? / Are you a university student?		
Da / Yes	58	100
Ne / No	0	0
Koji fakultet studirate? / Which faculty are you enrolled at?		
Ekonomski / Faculty of Economy	6	10
Pravni / Faculty of Law	6	10
Građevinski / Faculty of Civil Engineering	6	10
Medicinski/Stomatološki / Faculty of Medicine/Dentistry	6	10
Farmaceutski / Faculty of Pharmacy	6	10
Nastavnički / Faculty of Education	29	50
Da li koristite društvene mreže? / Do you use social media networks?		
Da / Yes	58	100
Ne / No	0	0
Koje društvene mreže koristite? / Which ones do you use?		
Fejsbuk / Facebook	15	25.9
Instagram / Instagram	8	13.8
Tviter / Twitter	5	8.6
TikTok / TikTok	1	1.7
Sve od navedenog / All the above	29	50.0
Ukupno / Total	58	100.0

Table 1. Sociodemographic data and data related to the structure of the sample

je ostatak ispitanika (65,6%) bilo ženskog pola. Takođe, 70% ispitanika je imalo između 18 i 20 godina, a najviše njih je studiralo nastavnički fakultet (50%). Svi ispitanici koji su se našli u uzorku su bili studenti (100%) i svi ispitanici iz uzorka su bili korisnici društvenih mreža (100%). Na osnovu rezultata istraživanja zaključuje se da je čak 50,0% ispitanika koristilo sve ponuđene društvene mreže (Fejsbuk, Instagram, Tviter i Tiktok). Od preostalih 50,0%, njih 25,9% je koristilo samo Fejsbuk, 13,8% je koristilo samo Instagram, 8,6% je koristilo samo Tviter, dok je 1,7% koristilo samo Tiktok. Zaključuje se da su među studentima veoma rasprostranjene i veoma popularne društvene mreže, koje se koriste u različite svrhe.

U nastavku je predstavljena pojava narcizma u uzorku.

Pomoću prethodno opisanih mernih instrumenata, došlo se do saznanja da je od ukupnog broja ispitanika, njih 93,1% pripadalo grupi narcisoidnih ličnosti, dok samo 6,9% nije pripadalo ovoj grupi (Grafikon 1). Na osnovu prethodno navedenog, može se zaključiti da su osnovne postavke procesa uzorkovanja zadovoljene, te da je uzorak relevantan za dalje razmatranje.

Analizom **Tabele 2** može se zaključiti da najveći broj ispitanika koristi društvene mreže u svrhu zabave ($3,55 \pm 0,65$), potom u svrhu informisanja ($3,42 \pm 0,91$) i u akademske svrhe ($3,07 \pm 0,56$). Nešto ređe se društvene mreže koriste u svrhu socijalizacije ($2,56 \pm 0,48$), a najmanje se koriste zato što studenti to „moraju“, ili zato što su iz nekog razloga „prinudjeni“ na to ($2,03 \pm 0,56$).

Primenom Pirsonovog koeficijenta linearne korelacije, u nastavku rada je ispitan stepen korelacije između narcizma i svake od svrha upotrebe društvenih mreža. Osnovna svrha koreliranja je bilo prikazivanje međusobne povezanosti različitih svrha upotrebe društvenih mreža sa pojavom narcizma kod mladih ljudi.

Razmatranjem međusobnog odnosa narcizma i akademske svrhe upotrebe društvenih mreža (**Tabela 3**), utvrđen je veoma nizak stepen korelacije između ove dve varijable, tačnije, $r = 0,20$, uz $p = 0,132$. Reč je o veoma maloj, gotovo neznatnoj korelaciji.

Razmatranjem međusobnog odnosa narcizma i socijalizacije kao svrhe društvenih mreža, utvrđen je stepen korelacije između ove dve varijable od $r = 0,66$, uz $p < 0,001$. Reč je o srednje jakoj korelaciji.

Na osnovu rezultata istraživanja, utvrđeno je postojanje veoma slabe korelacije između narcizma i informativne svrhe upotrebe društvenih mreža, tačnije koeficijent korelacije je iznosio $r = 0,28$, uz $p = 0,033$.

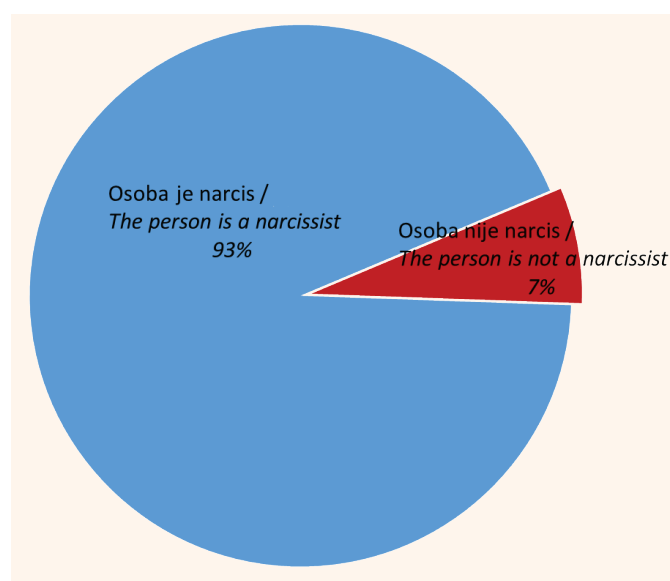
Razmatranjem međusobnog odnosa narcizma i zabave kao svrhe upotrebe društvenih mreža, utvrđen je stepen korelacije između ove dve varijable od $r = 0,88$, uz $p < 0,001$. Reč je o veoma visokoj (skoro pa idealnoj) korelaciji između varijabli.

The data analysis on the given sample yielded the results presented in **Table 1**. A total of 58 respondents participated in the research process. Of the total number of respondents, 34.4% were male, while the remaining respondents were female (65.6%). Also, 70% of the respondents were between 18 and 20 years old, and the highest number of them were students of the Faculty of Education (50%). All respondents in the sample were university students (100%) and all respondents in the sample were social media users (100%). The research results show that as many as 50.0% of respondents used all of the social media networks (Facebook, Instagram, Twitter, and TikTok) listed in the questionnaire. Of the remaining 50.0%, 25.9% only used Facebook, 13.8% only used Instagram, 8.6% only used Twitter, and 1.7% only used TikTok. The conclusion is that social media networks, which are used for different purposes, are widespread and very popular among university students.

The presence of narcissism in the sample is presented next.

Using the previously described measuring instruments, it was found that out of the total number of respondents, 93.1% belonged to the group of narcissistic personalities, while only 6.9% did not belong to this group (**Figure 1**). Based on the above, it can be concluded that the basic principles of the sampling process were met rendering the sample relevant for further consideration.

Analysis of **Table 2** leads to the conclusion that the largest number of respondents use social media networks for entertainment (3.55 ± 0.65), followed by the purpose of obtaining information (3.42 ± 0.91) and academic purposes (3.07 ± 0.56). Social media networks are used somewhat less frequently for socialization



Grafikon 1. Narcizam u uzorku

Figure 1. Presence of narcissism in the sample

Tabela 2. Svrha upotrebe društvenih mreža

	<i>n</i>	Aritmetička sredina / <i>Mean</i>	Standardna devijacija / <i>Standard deviation</i>	Minimum / <i>Minimum</i>	Maksimum / <i>Maximum</i>
Akadska svrha / <i>Academic purpose</i>	58	3.07	0.56	2.00	4.29
Svrha socijalizacije / <i>Socialization purpose</i>	58	2.56	0.48	1.83	3.83
Informativna svrha / <i>Informative purpose</i>	58	3.42	0.91	1.00	5.00
Kompulzivna upotreba društvenih mreža / <i>Compulsive use of social media networks</i>	58	2.03	0.56	1.25	3.50
Svrha zabave / <i>Entertainment purpose</i>	58	3.55	0.65	2.25	5.00

Rezultati istraživanja pokazali su skoro potpuno odsustvo korelacije između narcizizma i kompulzivne upotrebe društvenih mreža. Koeficijent korelacije između ove dve varijable je iznosio $r = 0,10$, uz $p = 0,455$.

DISKUSIJA

Različita prethodna istraživanja dokazala su da je narcisoidni poremećaj ličnosti usko povezan sa upotrebom društvenih mreža. U svom istraživanju, Kasale i Banki navode da postoji značajna povezanost problematične upotrebe društvene mreže Fejsbuk sa narcisoidnim poremećajem ličnosti [15]. U svom radu, pomenute autorke navode da su do sada objavljena brojna istraživanja upravo na ovu temu. Akož i Erbaš u svom istraživanju navode da upotreba društvenih mreža može uzrokovati narcisoidni poremećaj ličnosti [12], baš kao i obrnuto – osobe sa narcisoidnim poremećajem ličnosti mogu koristiti društvene mreže u različite svrhe. Slično je zabeleženo i u našem istraživanju, gde se navodi kako postoji nekoliko različitih

Table 2. The purpose of using social media networks

(2.56 ± 0.48), and they are used the least because students feel that they “have to” use them or because they are “compelled” to do so for some reason (2.03 ± 0.56).

In the next segment of this article, Pearson's linear correlation coefficient was used to examine the degree of correlation between narcissism and each of the purposes of using social media networks. The main purpose of establishing correlations was to show the interrelationship between different purposes of using social media networks and the presence of narcissism in young people.

The analysis of the interrelationship between narcissism and the academic purpose of using social networks (Table 3) showed a very low degree of correlation between these two variables, specifically, it was $r = 0.20$, with $p = 0.132$. This correlation is quite small.

The analysis of the interrelationship between narcissism and socialization as the purpose of using social media networks showed the degree of correlation between these two variables to be $r = 0.66$, with $p < 0.001$. This is a moderately strong correlation.

Tabela 3. Korelacija između narcizizma i različitih svrha upotrebe društvenih mreža

Varijable / <i>Variables</i>	Narcizizam/ Narcisoidni poremećaj ličnosti / <i>Narcissism/ Narcissistic personality disorder</i>
Akadska svrha upotrebe društvenih mreža / <i>The academic purpose of using social media networks</i>	$r = 0.20$ $p = 0.132$
Socijalizacija kao svrha upotrebe društvenih mreža / <i>Socialization as the purpose of using social media networks</i>	$r = 0.66$ $p < 0.001$
Informativna svrha upotrebe društvenih mreža / <i>Informative purpose of using social media networks</i>	$r = 0.28$ $p = 0.033$
Zabava kao svrha upotrebe društvenih mreža / <i>Entertainment as the purpose of using social media networks</i>	$r = 0.88$ $p < 0.001$
Kompulzivna upotreba društvenih mreža / <i>Compulsive use of social media networks</i>	$r = 0.10$ $p = 0.455$

Table 3. Correlation between narcissism and different purposes of using social media networks

svrha upotrebe društvenih mreža, a to su: upotreba u akademske svrhe, radi socijalizacije, zabave, informisanja, te kompulzivna upotreba. Da je upotreba društvenih mreža u akademske svrhe od strane narcisoidnih osoba prisutna, što je zabeleženo i u našem istraživanju, izvestile su i autorke Mekejn i Kempbel, koje su navele da narcisoidne osobe doživljavaju kulturno uzdizanje kroz upotrebu društvenih mreža [16].

Na osnovu studije slučaja koju su sproveli Umber i saradnici, dolazi se do zaključka da narcisoidne osobe koriste društvene mreže u svrhu socijalizacije, što čini da se oni osećaju bolje [17]. Takvi rezultati su potvrđeni i našim istraživanjem, ali i istraživanjem koje je sprovela Freglet [18].

Da narcisoidne osobe koriste društvene mreže u svrhu zabave i informisanja, kako je potvrđeno na analiziranom uzorku u našoj studiji, zabeleženo je i u istraživanju koje su sproveli Goel i saradnici [19]. Slično je potvrđeno i u istraživanju Parambukis i saradnika [20], sa posebnim osvrtom na Instagram kao društvenu mrežu. Nije zabeleženo u prethodnim istraživanjima da su narcisoidne osobe kompulzivno koristile društvene mreže.

ZAKLJUČAK

Osobe sa narcisoidnim poremećajem ličnosti definitivno koriste društvene mreže na specifičan način. Istraživanje pokazuje da postoje osobe sa narcisoidnim poremećajem ličnosti koje koriste društvene mreže i u akademske, i u informativne svrhe, ali i u svrhu zabave, socijalizacije, ili pak da ih kompulzivno koriste. Ipak, ispitivanjem korelacije između narcizma i same svrhe upotrebe društvenih mreža došlo se do saznanja da osobe sa narcisoidnim poremećajem ličnosti najčešće koriste društvene mreže u svrhu sopstvene zabave, kao i u svrhu socijalizacije. Veoma retko koriste društvene mreže u svrhu informisanja ili u akademske svrhe, a koriste ih i iz kompulzivnih razloga. Na osnovu navedenog, utvrđuje se da narcizam inicira zabavu i potencijalno samopromociju kao vid zabave na društvenim mrežama, te i umrežavanje, što je neodvojivo deo narcizma. Društvene mreže su za osobe koje imaju narcisoidni poremećaj ličnosti izvor zabave i socijalizacije, a ne izvor informacija. Osnovna ograničenja istraživanja odnose se na poteškoće u formiranju uzorka, te postojanje potencijalne opasnosti od nerazumevanja postavljenih pitanja u anketnom upitniku od strane ispitanika.

Sukob interesa: Nije prijavljen.

Based on the results of the study, a very weak correlation between narcissism and the informative purpose of using social networks was established, more precisely, the correlation coefficient was $r = 0.28$, with $p = 0.033$.

In the analysis of the mutual relationship between narcissism and entertainment as the purpose of using social media networks, the degree of correlation between these two variables was determined to be $r = 0.88$, with $p < 0.001$.

The results of the study showed an almost complete absence of correlation between narcissism and compulsive use of social media networks. The correlation coefficient between these two variables was $r = 0.10$, with $p = 0.455$.

DISCUSSION

Various previous studies have proven that narcissistic personality disorder is closely related to the use of social media networks. In their study, Casale and Banchi state that there is a significant association between problematic use of the social media network Facebook and narcissistic personality disorder [15]. In their article, the abovementioned authors state that, so far, numerous studies have been published on this very topic. Akkoz and Erbaş state, in their study, that the use of social media networks can cause narcissistic personality disorder [12], and vice versa – people with narcissistic personality disorder can use social media networks for different purposes. The same was noted in our study, where it is stated that there are several different purposes for using social networks, namely: academic purposes, socialization, entertainment, obtaining information, and compulsive use. The use of social media networks for academic purposes by narcissists is present, which was recorded in our study, and was also reported by McCain and Campbell, who stated that narcissists experience cultural enlightenment through the use of social media networks [16].

Based on a case study conducted by Umber et al., it can be concluded that narcissists use social media networks for socialization, which makes them feel better [17]. Such results were confirmed by our study, as well as by the study conducted by Freglette [18].

The study conducted by Goel et al. [19] also noted that narcissists use social media networks for entertainment and obtaining information (as confirmed in the sample analyzed in our study). Paramboukis et al. [20] also confirmed this, with special reference to Instagram as a social media network. Previous studies have not found compulsive use of social media networks in narcissists.

LITERATURA / REFERENCES

1. Yakeley J. Current understanding of narcissism and narcissistic personality disorder. *BJPsych Advances*. 2018 Sep;24(5):305-15. doi:10.1192/bja.2018.20.
2. Stranieri G, De Stefano L, Greco AG. Pathological Narcissism. *Psychiatr Danub*. 2021 Sep;33(Suppl 9):35-40. Dostupno na: https://www.psychiatria-danubina.com/UserDocImages/pdf/dnb_vol33_noSuppl%209/dnb_vol33_noSuppl%209_35.pdf
3. Ronningstam E. Narcissistic personality disorder: a current review. *Curr Psychiatry Rep*. 2010 Feb;12(1):68-75. doi: 10.1007/s11920-009-0084-z.
4. Campbell WK, Baumeister RF. Narcissistic personality disorder. In: Fisher JE, O'Donohue WT, editors. *Practitioner's guide to evidence-based psychotherapy*. New York: Springer; 2006. p. 423-31. doi: 10.1007/978-0-387-28370-8_42.
5. Caligor E, Levy KN, Yeomans FE. Narcissistic personality disorder: diagnostic and clinical challenges. *Am J Psychiatry*. 2015 May;172(5):415-22. doi: 10.1176/appi.ajp.2014.14060723.
6. Edershile EA, Wright AGC. Grandiose and vulnerable narcissistic states in interpersonal situations. *Self Identity*. 2021;20(2):165-81. doi: 10.1080/15298868.2019.1627241.
7. Köse SS, Erbaş O. Personality disorders diagnosis, causes, and treatments. *D J Tx Sci*. 2020;5(1-2):22-31. doi: 10.5606/dsufnjt.2020.013.
8. Long P. *Diagnostic and statistical manual of mental disorders, Third edition (DSM-III)*. 1980:2.
9. Savci M, Turan M, Griffiths MD, Ercengiz M. Histrionic personality, narcissistic personality, and problematic social media use: testing of a new hypothetical model. *Int. J. Ment. Health Addict*. 2021 Aug;19:986-1004. doi: 10.1007/s11469-019-00139-5.
10. Somerville TA. The effect of social media use on narcissistic behavior. *McKendree University Online Journal of Undergraduate Research [Internet]*. 2015 [cited 2024 Oct 29]. 25. Dostupno na: <https://www.mckendree.edu/academics/scholars/somerville-issue-25.pdf>
11. Gnambs T, Appel M. Narcissism and social networking behavior: a meta-analysis. *J Pers*. 2018 Apr;86(2):200-12. doi: 10.1111/jopy.12305.
12. Akkoz M, Erbaş O. The relationship between social media use and narcissism. *D J Tx Sci* 2020;5(1-2):32-8. doi: 10.5606/dsufnjt.2020.014.
13. Leung L, Zhang R. Narcissism and social media use by children and adolescents. In Young KS, de Abreu CN, editors. *Internet addiction in children and adolescents: Risk factors, assessment, and treatment*. New York: Springer; 2017. p. 47-64. doi: 10.1891/9780826133731.0003.
14. Gupta S, Bashir L. Social networking usage questionnaire: development and validation in an Indian higher education context. *Turk. online j. distance educ*. 2018 Oct 1;19(4):214-27. doi: 10.17718/tojde.471918.
15. Casale S, Banchi V. Narcissism and problematic social media use: a systematic literature review. *Addict Behav Rep*. 2020 Jan 28;11:100252. doi: 10.1016/j.abrep.2020.100252.

CONCLUSION

People with narcissistic personality disorder definitely use social media in a specific way. This study has demonstrated there are people with narcissistic personality disorder who use social media networks both for academic and informative purposes, but also for entertainment and socialization or out of compulsion. However, an analysis of the correlation between narcissism and the purpose of using social media networks discovered that people with narcissistic personality disorder most often use social media networks for entertainment, as well as for socialization. These individuals rarely use social media networks for informative or academic purposes and may use them out of compulsion. Based on the above, the conclusion is that narcissism initiates entertainment and potentially self-promotion as a form of entertainment on social media networks, as well as networking, as an inseparable part of narcissism. For people with narcissistic personality disorder, social media networks are a source of entertainment and socialization, not a source of information. The study's main limitations are related to the difficulties in forming a sample and the potential danger of the respondents misunderstanding the questions asked in the questionnaire.

Conflict of interest: None declared.

16. McCain J, Campbell K. Narcissism and Social Media Use: A Meta-Analytic Review. *Psychol. Pop. Media Cult*. 2018;7(3):308-27. doi:10.1037/ppm0000137.
17. Umber S, Ali M, Latif MA. Exploring the relationship between digital narcissism, subjective wellbeing, and social media usage: a case study on GCUF students on Facebook and Instagram. *Remit Rev*. 2023 Jan;9(1):812-36. doi:10.33182/rr.vx9il.24.
18. Freglette C. Predicting narcissism through social media. *Caravel Undergraduate Research Journal [Internet]*. 2021 [Citirano: 29.10. 2024.]. Dostupno na: https://sc.edu/about/offices_and_divisions/research/news_and_pubs/caravel/archive/2021_spring/2021_narcissism.php
19. Goel M, Mishra R, Kanwar C. Analysing the relation between social media usage and narcissism among young adults: Indian setting. *Int. j. Indian psychol*. 2023;11(2):2514-20. doi: 10.25215/1102.248.
20. Parambous O, Skues J, Wise L. An exploratory study of the relationships between narcissism, self-esteem and Instagram use. *Social Networking*. 2016 Apr;5(2):82-92. doi:10.4236/sn.2016.52009.

DOSTUPNOST PREVENTIVNIH STOMATOLOŠKIH USLUGA PREDŠKOLSKOJ I ŠKOLSKOJ DECI U JAVNIM USTANOVAMA NA PODRUČJU KANTONA SARAJEVO

ORIGINALNI RAD

ORIGINAL ARTICLE

AVAILABILITY OF PREVENTIVE DENTAL SERVICES TO PRESCHOOL AND SCHOOL CHILDREN WITHIN THE PUBLIC HEALTH SECTOR IN THE CANTON OF SARAJEVO

Amela Brčkalija¹, Amer Ovčina², Aida Ramić-Čatak^{2,3}, Zarema Obradović²,
Šeila Cilović-Lagarija³, Adis Hrvačić⁴, Maja Pločo⁵

¹ Javna ustanova „Dom zdravlja Kantona Sarajevo“, Organizaciona jedinica „Dom zdravlja Stari grad Sarajevo“, Sarajevo, Bosna i Hercegovina

² Univerzitet u Sarajevu, Fakultet zdravstvenih studija, Sarajevo, Bosna i Hercegovina

³ Zavod za javno zdravstvo Federacije Bosne i Hercegovine, Sarajevo, Bosna i Hercegovina

⁴ Zavod za javno zdravstvo Srednje bosanskog Kantona, Travnik, Bosna i Hercegovina

⁵ Sveučilište „Vitez“, Vitez, Bosna i Hercegovina

¹ Public institution Primary Healthcare Center of the Canton of Sarajevo, Organizational unit Primary Healthcare Center Stari grad Sarajevo, Sarajevo, Bosnia and Herzegovina

² University of Sarajevo, Faculty of Health Studies, Sarajevo, Bosnia and Herzegovina

³ Institute for Public Health of the Federation of Bosnia and Herzegovina, Sarajevo, Bosnia and Herzegovina

⁴ Institute for Public Health of the Central Bosnian Canton, Travnik, Bosnia and Herzegovina

⁵ Vitez University, Vitez, Bosnia and Herzegovina

SAŽETAK

Uvod: Oralno zdravlje predstavlja segment opšteg zdravlja čoveka a čini ga stanje oralnih tkiva koje doprinosi celokupnom fizičkom, psihičkom i socijalnom blagostanju, omogućavajući osobama da jedu, komuniciraju i učestvuju u društvenom životu bez neprijatnosti, neugodnosti ili stresa. Ovo istraživanje ima za cilj da utvrdi učestalost sprovođenja sistematskih pregleda u ranom dečijem uzrastu, praksu roditelja/staratelja u procesu očuvanja oralnog zdravlja dece, kao i zadovoljstvo pruženim uslugama.

Materijali i metode: Istraživanje je sprovedeno kao deskriptivna i komparativna studija preseka u Javnoj zdravstvenoj ustanovi *Domovi zdravlja Kantona Sarajevo*. Ispitanici su bili odgovorna lica – šefovi stomatoloških službi, te korisnici preventivnih stomatoloških usluga. Istraživanje je obuhvatilo ukupno pet rukovodilaca i 209 roditelja, a sprovedeno je putem onlajn obrasca *Google forms*, a na osnovu originalnog autorskog upitnika.

Rezultati: Dostupnost stomatološke zdravstvene zaštite je na visokom nivou prema iskazu roditelja, te je utvrđeno da je dostupna u 139 ili 66,5% slučajeva. Samo 24 ili 11,7% ispitanika su navela da nemaju dostupnu stomatološku zdravstvenu zaštitu. Većina roditelja navodi da ne čekaju na pregled zuba, da su zadovoljni pristupačnošću osoblja, te su dali visoku ocenu od $4,14 \pm 1,21$ na skali od 1 do 5.

Zaključak: Na osnovu rezultata istraživanja, uspeli smo da dokažemo da je na području Kantona Sarajevo osigurana kvalitetna i sigurna preventivna stomatološka zaštita za predškolsku i školsku decu u javnom zdravstvenom sektoru. Većina roditelja navode da su zadovoljni profesionalnim radom i pristupačnošću osoblja.

Ključne reči: preventivne stomatološke usluge, predškolska deca, školska deca, Kanton Sarajevo

ABSTRACT

Introduction: Oral health is a segment of general human health reflected in the condition of oral tissues, which contributes to overall physical, psychological and social well-being, enabling people to eat, communicate and participate in social life without discomfort, inconvenience or stress. This study aims to determine the frequency of conducting regular oral and dental examinations in early childhood, the practice of parents/guardians in the process of preserving children's oral health, as well as the satisfaction with the services provided.

Materials and methods: The study was conducted as a cross-sectional, descriptive and comparative study at the Primary Healthcare Center of the Canton of Sarajevo. Heads of dental services and service users were the respondents of the study. The study included five heads of dental services and 209 parents who participated via an online *Google forms* survey that was based on an original questionnaire designed by the study authors.

Results: The availability of dental health care is at a high level according to parents, and it was determined to be available in 139 or 66.5% of cases. Only 24 or 11.7% of respondents stated that they do not have access to dental health care. Most parents stated that they did not have to wait for a dental examination for their children and that they were satisfied with the accessibility of the staff, giving a high score of 4.14 ± 1.21 on a scale of 1 to 5.

Conclusion: Based on the results of the study, we were able to prove that quality and safe preventive dental care for preschool and school children in the public health sector is provided in the Canton of Sarajevo. Most parents stated that they were satisfied with the professionalism, work and accessibility of the staff.

Keywords: preventive dental services, preschool children, school children, Canton of Sarajevo

Autor za korespondenciju:

Amer Ovčina

Fakultet zdravstvenih studija, Univerzitet u Sarajevu

Bolnička 25, 71000 Sarajevo, Bosna i Hercegovina

Elektronska adresa: amerovcina@yahoo.com

Corresponding author:

Amer Ovčina

Faculty of Health Studies, University of Sarajevo

75 Bolnička Street, 71000 Sarajevo, Bosnia and Herzegovina

E-mail: amerovcina@yahoo.com

Primljeno • Received: July 8, 2024; **Revidirano • Revised:** December 26, 2024; **Prihvaćeno • Accepted:** December 27, 2024; **Online first:** December 31, 2024

DOI: 10.5937/smcl5-51982

UVOD

Oralno zdravlje predstavlja segment opšteg zdravlja čoveka a čini ga stanje oralnih tkiva koje doprinosi celokupnom fizičkom, psihičkom i socijalnom blagostanju, omogućavajući osobama da jedu, komuniciraju i učestvuju u društvenom životu bez neprijatnosti, neugodnosti ili stresa.

Cilj stomatološke zaštite na nivou primarne zdravstvene zaštite je održavanje dobrog oralnog zdravlja pre nego što se pojave problemi koji zahtevaju lečenje. Idealno bi bilo da se celokupna populacija podvrgava periodičnim pregledima na mestima gde se okuplja veliki broj ljudi, kao što su škole, preduzeća, mesne zajednice i domovi zdravlja. U oblastima gde se to ne može postići, potrebno je izabrati mesta koja najviše odgovaraju pripadnicima lokalne zajednice [1].

U većini zemalja u razvoju nije lako organizovati nezavisni sistem oralne zdravstvene zaštite u zajednici. Neke zemlje već imaju dobro organizovanu primarnu zdravstvenu zaštitu i za njih je imperativ da integrišu oralno zdravlje u postojeću infrastrukturu zdravstvene zaštite. Neke zemlje već imaju zdravstvenu i obrazovnu infrastrukturu, ali su im potrebna sredstva koja bi omogućila proširenje njihove delatnosti na oralnu zdravstvenu zaštitu [2,3].

Praćeno je stanje oralnog zdravlja stanovništva koje živi na području Federacije Bosne i Hercegovine. S tim u vezi, može se reći da je stanje oralnog zdravlja kako odrasle populacije tako i dece i omladine na veoma niskom nivou. Iz tog razloga, Federalno ministarstvo zdravstva pokrenulo je inicijativu za donošenje programa mera za poboljšanje oralnog zdravlja stanovništva u skladu sa *Zakonom o stomatološkoj djelatnosti* i u saradnji sa Zavodom za javno zdravstvo Federacije Bosne i Hercegovine. U okviru ovog programa poseban fokus biće stavljen na decu predškolskog uzrasta i na promociju prirodne ishrane za najmlađu populaciju sa akcentom na podsticanje dojenja, koje omogućava zdrav rast deteta, kao i razvoj facijalnih struktura. Takođe, fokus će biti na deci predškolskog uzrasta kako bi se sačuvali prvi stalni zubi [4].

Preventivne stomatološke usluge su tako označene zato što omogućavaju stomatologu da prati oralno zdravlje pacijenata, promoviše zdrave navike, sprečava nove bolesti kroz različite usluge lečenja i uoči rane znake problema oralnog zdravlja. Ovo daje pacijentu i stomatologu dovoljno vremena da identifikuju, leče i spreče problem.

Usluge kao što su plombiranje zuba, lečenje kanala korena zuba, lečenje paradontopatije, ortodonticija ili vađenje zuba, ne smatraju se preventivnom stomatologijom. Oni su usmereni na rešavanje već postojećeg problema i obično spadaju u manje (rutinske) ili veće procedure [5].

INTRODUCTION

Oral health is a segment of general human health reflected in the condition of oral tissues, which contributes to overall physical, psychological and social well-being, enabling people to eat, communicate and participate in social life without discomfort, inconvenience or stress.

The goal of dental care at the primary healthcare level is to maintain good oral health before problems requiring treatment arise. Ideally, the entire population should undergo periodic examinations in places with high concentrations of people, such as schools, companies, local community centers, and primary healthcare centers. In areas where this cannot be achieved, it is necessary to choose venues that are most suitable for the community members [1].

In most developing countries, it is not easy to organize an independent oral healthcare system in the community. Some countries already have well-organized primary healthcare and for them it is imperative to integrate oral health into the existing healthcare infrastructure. Some countries already have a healthcare and education infrastructure, but they need funds that would enable the expansion of their activities to include oral healthcare [2,3].

The state of oral health among the population residing in the territory of the Federation of Bosnia and Herzegovina was monitored. In this regard, it can be said that the state of oral health of both the adult population and children and adolescents is at a very low level. For this reason, the Federal Ministry of Health launched an initiative to adopt a program of measures aimed at improving the oral health of the population in accordance with the *Law on Dental Practice* and in cooperation with the Institute for Public Health of the Federation of Bosnia and Herzegovina. Within this program, special focus will be placed on preschool children and on promoting nature-based nutrition for the youngest population with an emphasis on encouraging breastfeeding, which enables healthy growth in a child as well as the development of the structures of the face and mouth. Also, the focus will be on preschool children so as to preserve the first permanent teeth [4].

Preventive dental services are designated as such because they enable the dentist to monitor the patient's oral health, promote healthy habits, prevent new diseases through various treatment services, and spot early signs of oral health problems. This gives the patient and the dentist enough time to identify, treat and prevent the problem.

Services such as fillings, root canal therapy, periodontal treatments, orthodontics or tooth extractions are not considered preventive dentistry. They are aimed at solving an existing problem and usually fall under basic or major procedures [5].

Tokom redovnog stomatološkog pregleda, stomatolog će obaviti oralni pregled kako bi proverio da li ima znakova karijesa ili bolesti desni, abnormalnog trošenja zuba, malokluzije ili mehaničkih problema, bolesti mekog tkiva (kao što je rak usne šupljine) i dr. Nakon ovog pregleda obično sledi profesionalno čišćenje, uz nanošenje fluora kada je to potrebno, kako bi se obezbedila čista, zdrava i zaštićena usna šupljina. Preventivne stomatološke usluge ne treba zanemariti. Redovne posete stomatologu i prevencija problema oralnog zdravlja mogu pomoći u održavanju opšteg zdravlja i blagostanja kako starite i uštedeti vreme, novac i potencijalnu nelagodnost izbegavanjem ozbiljnih zubnih bolesti [6].

Deca uzrasta od 4–5 godina se identifikuju sa svojim roditeljima, pa je odnos roditelja prema oralnom zdravlju i redovnom praćenju od presudnog značaja [7,8].

Ponašanje roditelja kao uzora po ovom pitanju je mnogo važnija metoda za postizanje željenog cilja u zdravstvenom vaspitanju od bilo koje druge poznate metode. Da li će dete kasnije imati zdrave zube ili će mu zubi biti izvor bola i problema zavisi od brige roditelja [9].

Osnovni cilj ove studije je da se utvrdi dostupnost preventivnih stomatoloških usluga u javnom zdravstvu, kao i efikasnost u pružanju usluga. Ova studija ima za cilj da utvrdi učestalost sprovođenja redovnih pregleda u ranom detinjstvu, praksu roditelja / staratelja u procesu očuvanja oralnog zdravlja dece, kao i zadovoljstvo pruženim uslugama.

MATERIJALI I METODE

Ovo je deskriptivna, uporedna studija preseka koja je rađena u okviru Javne zdravstvene ustanove, *Dom zdravlja Kantona Sarajevo*, u četiri stomatološke službe: Hadžići, Trnovo, Stari Grad, Novo Sarajevo i Dom zdravlja Novi Grad. U istraživanje su bili uključeni rukovodioci stomatoloških službi i korisnici usluga (roditelji dece). Učestvovali su putem onlajn ankete *Google forms* zasnovane na originalnom autorskom upitniku. Studija je obuhvatila ukupno pet rukovodilaca službi i 209 nasumično odabranih roditelja. Testiranje unutrašnje konzistentnosti studije sprovedeno je na uzorku od 20 roditelja, a Kronbahov koeficijent alfa za ovu veličinu uzorka bio je 0,854, što ukazuje na dobru unutrašnju konzistentnost i snagu upitnika.

U našoj studiji poštovani su svi etički principi koji se odnose na zaštitu identiteta ispitanika i podataka dobijenih putem upitnika / intervju. Poverljivost podataka garantuje istraživač. Ispitanici nisu imali finansijski ili bilo kakav drugi interes za učešće u njoj.

Nominalne i ordinalne varijable su predstavljene kroz broj slučajeva i procenat, dok su kontinuirane

During a regular dental exam, the dentist will perform an oral exam to check for signs of cavities or gum disease, abnormal tooth wear, abnormal alignment or mechanical problems, soft tissue disease (such as oral cancer), and more. This examination is usually followed by a professional cleaning, along with the application of fluoride when appropriate, to ensure a clean, healthy and protected oral cavity. Preventive dental services should not be neglected. Regular dental visits and prevention of oral health problems can help maintain overall health and well-being as you age and save time, money, and potential discomfort by avoiding serious dental disease [6].

Children at the age of 4–5 identify with their parents, so parental attitudes towards oral health and regular follow-ups is of crucial importance [7,8].

Basic role modeling by parents is a much more important method for achieving the desired goal in health education than any other known method. Whether the child will later have healthy teeth or whether their teeth will be a source of pain and problems depends on parental care [9].

The main objective of this study is to determine the availability of preventive dental services in the public health sector, as well as the efficiency in providing services. This study aims to determine the frequency of conducting regular examinations in early childhood, the practice of parents / guardians in the process of preserving children's oral health, as well as satisfaction with the services provided.

MATERIALS AND METHODS

This was a cross-sectional, descriptive, comparative study carried out within the Public Health Institution, *Primary Healthcare Centers of the Canton of Sarajevo*, at four dental care services: Hadžići, Trnovo, Stari Grad, Novo Sarajevo, and Novi Grad Primary Healthcare Center. Heads of dental services and service users (children's parents) were the respondents of the study. They participated via an online *Google forms* survey that was based on an original questionnaire designed by the study authors. The study included five heads of dental services and 209 randomly selected parents. Internal consistency testing of the study was carried out on a sample of 20 parents and Cronbach's alpha for this sample size was 0.854 indicating a good internal consistency and power of the questionnaire.

In this study, all ethical principles related to the protection of the identity of the respondents and the data obtained through questionnaires / interviews were respected. Data confidentiality is guaranteed by the researcher. Respondents had no financial or any other interest for participation.

varijable, aritmetička sredina i standardna devijacija, korišćene za prikaz srednjih vrednosti i mera disperzije. Rezultati testa su smatrani statistički značajnim na nivou statističke značajnosti $p < 0,05$. Za statističku analizu dobijenih podataka korišćen je softver SPSS for Windows (Version 13.0, SPSS Inc, Chicago, Illinois, USA) i Microsoft Excel (Version 11, Microsoft Corporation, Redmond, WA, USA).

REZULTATI

Upitnik za rukovodioce stomatoloških službi popunilo je ukupno pet ispitanika.

Samo jedan rukovodilac stomatoloških službi (20,0%) je naveo da imaju usvojenu dokumente o obezbeđivanju kvaliteta u skladu sa kojim pružaju usluge, da imaju strategiju za unapređenje kvaliteta stomatoloških usluga i da imaju uspostavljen informacioni sistem u svojoj ustanovi. Od ukupnog broja rukovodilaca stomatoloških službi, dva (40,0%) su izjavila da osoblje

Nominal and ordinal variables are presented as the number of cases and percentages, while continuous variables, the arithmetic mean and standard deviation, were used to display the mean values and measures of dispersion. The test results were considered statistically significant at the level of statistical significance $p < 0.05$. The SPSS for Windows software (Version 13.0, SPSS Inc, Chicago, Illinois, USA) and Microsoft Excel (Version 11, Microsoft Corporation, Redmond, WA, USA) were used for statistical analysis of the obtained data.

RESULTS

A total of five respondents completed the questionnaire for heads of dental services.

Only one head of dental services (20.0%) stated that they have adopted quality documents according to which they provide services, that they have a strategy for improving the quality of dental services, and that they have an established information system in their

Tabela 1. Analiza odgovora na pitanja iz upitnika za rukovodioce stomatoloških službi

Table 1. Analysis of answers to questions from the questionnaire for heads of dental services

	n	%
Ustanova ima strateški dokument/politiku za program prevencije karijesa i promocije oralnog zdravlja. / The institution has a strategic document/policy for a caries prevention and oral health promotion program.	2	40.0
Postoji dobra saradnja sa školama kada je u pitanju stomatološka zaštita. / There is a good relationship with schools when it comes to dental care.	5	100.0
Diplomirana medicinska sestra sa dodatnom edukacijom iz preventivne stomatologije mogla bi da obavlja prevenciju zubnih i oralnih bolesti kod dece predškolskog i školskog uzrasta. / A graduated nurse with additional education in preventive dentistry could perform prevention of dental and oral diseases in preschool and school children.	3	60.0
Postoje dokumenti o obezbeđivanju kvaliteta usluga u skladu sa kojima se pružaju usluge. / There are quality documents in place according to which services are provided.	1	20.0
Postoji strategija za unapređivanje kvaliteta stomatoloških usluga. / There is a strategy for improving the quality of dental services.	1	20.0
U ustanovi je uspostavljen informacioni sistem. / An information system has been established in the institution.	1	20.0
Zaposleni učestvuju u donošenju planova i programa za obezbeđivanje kvaliteta. / The staff participates in the adoption of plans and programs for quality assurance.	2	40.0
Da li ste zadovoljni profesionalnošću osoblja? / Are you satisfied with the professionalism of the staff?	4	80.0
Postoji plan za stručno usavršavanje kadrova zaposlenih u ustanovi. / There is a plan for the professional development of the personnel of the institution.	4	80.0
Da li vaši zaposleni dobijaju kontinuiranu obuku? / Do your employees receive continuous training?	5	100.0
Ustanova pruža stomatološke usluge deci i omladini sa smetnjama u razvoju, a arhitektonsko rešenje objekata omogućava pristup ovim pacijentima. / The institution provides dental services for children and adolescents with developmental disabilities the architectural design of the facilities enables access for these patients.	5	100.0
Postoje liste čekanja za preventivne stomatološke usluge. / There are waiting lists for preventive dental services.	2	40.0

Tabela 2. Sociodemografske karakteristike ispitanika

Table 2. Sociodemographic characteristics of respondents

		n	%
Pol / Gender	Muški / Male	36	17.2
	Ženski / Female	173	82.8
Starost / Age	18-34 godine / 18-34 years	33	15.8
	35-54 godine / 35-54 years	173	82.8
	Preko 54 godine / Over 54 years	3	1.4

njihove ustanove učestvuje u donošenju planova i programa za obezbeđivanje kvaliteta. Takođe, dva (40,0%) rukovodioca stomatoloških službi su izjavila da imaju strateški dokument (politiku) za program prevencije karijesa i unapređenja oralnog zdravlja u svojoj ustanovi. Svi rukovodioci stomatoloških službi (100%) su izjavili da imaju dobru saradnju sa školama po pitanju preventivnih usluga. Većina načelnika stomatoloških službi, odnosno njih četiri (80,0%), izjavilo je da u svojoj ustanovi imaju plan stručnog usavršavanja kadrova i da su zadovoljni stručnošću osoblja. Svi rukovodioci stomatoloških službi (100%) su naveli da zaposleni prolaze kontinuiranu edukaciju. Veći broj načelnika stomatoloških službi, odnosno njih troje (60,0%), izjavilo je da smatra da bi diplomirana medicinska sestra sa dodatnom edukacijom iz preventivne stomatologije mogla da sprovodi preventivne mere protiv bolesti zuba i usne šupljine kod dece predškolskog i školskog uzrasta. Svi rukovodioci stomatoloških službi (100%) su izjavili da njihova ustanova pruža stomatološke usluge deci i adolescentima sa smetnjama u razvoju i da arhitektonsko rešenje objekata omogućava ovim pacijentima pristup. Većina načelnika stomatoloških službi, njih troje (60,0%), izjavilo je da nemaju listu čekanja za preventivne stomatološke usluge. Institucije koje imaju liste čekanja navode da se čeka do 7 dana ili između 7 i 10 dana.

institution. Out of the total number of heads of dental services, two (40.0%) stated that the staff of their institution participates in the adoption of plans and programs for quality assurance. Also, two (40.0%) heads of dental services, stated that they have a strategic document (policy) for a program of caries prevention and promotion of oral health in their institution. All heads of dental services (100%) stated that they have good cooperation with schools regarding preventive services. The majority of heads of dental services, i.e., four (80.0%), stated that they have a staff development plan in their institution and that they are satisfied with the expertise of the staff. All heads of dental services (100%) stated that employees undergo continuous education. A greater number of heads of dental services, i.e., three (60.0%), stated that they believe that a graduate nurse with additional education in preventive dentistry could perform preventive measures against dental and oral diseases in preschool and school children. All heads of dental services (100%) stated that their institution provides dental services for children and adolescents with developmental disabilities and that the architectural design of the facilities enables access for these patients. Most heads of dental services, three (60.0%) stated that they do not have a waiting list for preventive dental services. Institutions that have waiting lists state that the wait is either up to 7 days or between 7 and 10 days.

A total of 209 respondents filled out the questionnaire for parents.

With respect to gender, 173 (82.8%) mothers and 36 (17.2%) fathers completed the questionnaire.

As to the age of the parents, the largest number was in the 35–54 years age group (173 or 82.8%), followed by the youngest age group, i.e., 18–34 years (33 or 15.8%), while the smallest number (3 or 1.4 %) of respondents were in the group aged over 54 years.

A majority of parents, 167 (79.9%), stated that their children regularly brush their teeth and maintain oral

Tabela 3. Pregled navika unosa šećera i gaziranih pića, pranja zuba i oralne higijene

Table 3. Overview of sugar and soda intake, tooth brushing, and oral hygiene habits

		n	%
Da li vaše dete ima naviku redovnog pranja zuba i održavanja oralne higijene? / Does your child have regular teeth brushing and oral hygiene habits?	Da / Yes	167	79.9
	Ne / No	42	20.1
Da li vi imate naviku redovnog pranja zuba i održavanja oralne higijene? / Do you regularly brush your teeth and maintain oral hygiene?	Da / Yes	194	92.8
	Delimično / Partially	14	6.7
	Ne / No	1	0.5
Često konzumira rafinisane šećere (bombone, čokolade, grickalice) / Often consumes refined sugars (candy, chocolate, snacks)	Da / Yes	148	70.8
Često konzumira gazirana pića / Often consumes carbonated drinks	Da / Yes	33	15.8

Tabela 4. Analiza prevalencije stomatoloških oboljenja i lečenja

Table 4. Analysis of the prevalence of dental diseases and treatment

		n	%
Da li je vašem detetu dijagnostikovana bilo kakvo stomatološko oboljenje? / Has your child been diagnosed with any dental disease?	Da / Yes	14	6.7
Ako je odgovor da, navedite koju bolest zuba dete ima? / If the answer is yes, state which dental disease the child has?	Hipomineralizacija stalnih zuba / Hypomineralization of permanent teeth	2	1.0
	Karijes / Caries	12	5.7
Da li se vaše dete plaši stomatološkog pregleda? / Is your child afraid of a dental examination?	Da / Yes	18	8.7
	Dete ima strah od belog mantila / The child has a fear of the white coat.	5	2.4
	Dete se plaši aparata i buke / The child is afraid of the equipment and noise	7	3.4
	Delimično / Partially	65	31.6
Da li vaše dete koristi neku vrstu ortodontskog aparata? / Does your child use any type of orthodontic appliance?	Da / Yes	26	12.4

Upitnik za roditelje popunilo je ukupno 209 ispitanika.

Kada je u pitanju pol roditelja koji su učestvovali u istraživanju, upitnik je popunilo 173 (82,8%) majki i 36 (17,2%) očeva. Što se tiče starosti roditelja, najveći broj je bio u starosnoj grupi 35–54 godine (173 ili 82,8%), zatim u najmlađoj starosnoj grupi, odnosno 18–34 godine (33 ili 15,8%), dok je najmanji broj (3 ili 1,4 %) ispitanika bio u grupi starijih od 54 godine.

Većina roditelja, njih 167 (79,9%), izjavila je da njihova deca redovno peru zube i održavaju higijenu usne duplje. Na isti način, većina roditelja, njih 194 (92,8%), navela je da oni sami redovno peru zube i održavaju higijenu usne duplje. Ukupno 14 (6,7%) roditelja izjavilo je da delimično ima ove navike, a samo jedan roditelj je izjavio da nema takve navike. Prema podacima roditelja, u 148 (70,8%) slučajeva deca često konzumiraju rafinirani šećer, dok u 33 (15,8%) slučajeva deca često piju gazirana pića.

hygiene. In the same way, most parents, 194 (92.8%) of them, stated that they regularly brush their teeth and maintain oral hygiene. A total of 14 (6.7%) parents stated that they partially had these habits, and only one parent stated that they did not have such habits. According to the parents, in 148 (70.8%) of cases, children often consume refined sugar, while in 33 (15.8%) of cases, children often drink carbonated drinks.

In 14 (6.7%) cases children have been diagnosed with a dental disease. Among the dental diseases, parents most often mentioned caries (in 12 or 5.7% of the cases) and hypomineralization of permanent teeth (in 2 or 1.0 % of cases). Slightly less than half of the parents (95 or 45.5% of the cases) stated that their child is afraid of the dental examination, either completely or partially. Of the total number of respondents, 26 (12.4%) stated that their children use some type of orthodontic appliance.

A majority of respondents (139 or 66.5%) stated that preventive dental services are available to them

Tabela 5. Dostupnost preventivnih stomatoloških usluga u domu zdravlja

Table 5. Availability of preventive dental services at the primary healthcare center

		n	%
Da li su preventivne stomatološke usluge dostupne u domu zdravlja? / Are preventive dental services available at the primary healthcare center?	Da / Yes	139	66.5
	Delimično / Partially	42	20.1
Koliko je vaš dom udaljen od zdravstvene ustanove koja pruža preventivne stomatološke usluge? / How far is your home from a health facility that provides preventive dental services?	500 m / 500 m	41	19.6
	1.000 m / 1,000 m	62	29.7
	2.000 m / 2,000 m	48	23.0
	Preko 2.000 m / More than 2,000 m	56	26.8
Koliko dugo čekate na stomatološki pregled deteta kod stomatologa u domu zdravlja? / How long do you wait for your child's dental examination at the dentist in the primary healthcare center?	1-3 dana / 1-3 days	39	18.7
	3-5 dana / 3-5 days	33	15.8
	10 i više dana / 10 days and more	32	15.3
	Nema čekanja / No waiting	76	36.4
	Bez odgovora / No answer	29	13.9

Tabela 6. Redovnost poseta preventivnom stomatologu

		n	%
Da li vaše dete redovno posećuje preventivnog stomatologa? / Does your child visit a preventive dentist regularly?	Da / Yes	124	59.3
	Delimično / Partially	70	33.5
	Ne / No	15	7.2
Ako je vaš odgovor da ili delimično, navedite koliko puta godišnje? / If your answer is yes or partially, state how many times a year?	Na svaka tri meseca / Every three months	63	30.1
	Na svakih šest meseci / Every six months	86	41.1
	Na svakih dvanaest meseci / Every twelve months	45	21.5
	Bez odgovora / No answer	15	7.2
Da li vi lično redovno obavljate preventivne stomatološke preglede? / Do you personally regularly have preventive dental examinations?	Da / Yes	123	58.9
	Delimično / Partially	68	32.5
	Ne / No	18	8.6
Ako je odgovor da, navedite koliko puta u godini? / If yes, please specify how often in a year?	Svakog meseca / Every month	10	4.8
	Na svaka tri meseca / Every three months	22	10.5
	Na svakih šest meseci / Every six months	77	36.8
	Na svakih dvanaest meseci / Every twelve months	59	28.2
	Bez odgovora / No answer	41	19.6
Da li vam je ikada naplaćena usluga preventivnog stomatološkog pregleda vašeg deteta u domu zdravlja? / Have you ever been charged for the service of a preventive dental examination for your child at the primary healthcare center?	Da / Yes	1	0.6

U 14 (6,7%) slučajeva je deci dijagnostikovana zubna bolest. Od stomatoloških oboljenja, roditelji najčešće navode karijes (u 12 ili 5,7% slučajeva) i hipomineralizaciju stalnih zuba (u 2 ili 1,0% slučajeva). Nešto manje od polovine roditelja (95 ili 45,5% slučajeva) izjavilo je da se njihovo dete plaši stomatološkog pregleda, u potpunosti ili delimično. Od ukupnog broja ispitanika, 26 (12,4%) je izjavilo da njihova deca koriste neku vrstu ortodontskog aparata.

Većina ispitanika (139 ili 66,5%) je izjavila da su im preventivne stomatološke usluge dostupne u domu zdravlja, dok je 42 (20,1%) ispitanika izjavilo da su dostupne delimično. Udaljenost od objekta u kome se pružaju preventivne stomatološke usluge je u većini slučajeva oko 1.000 metara (62 slučaja ili 29,7%), u 56 (26,8%) slučajeva udaljenost je veća od 2.000 metara, udaljenost iznosi 2.000 metara u 48 (23,0. %) slučajeva, dok je za 41 (19,6%) ispitanika ta udaljenost oko 500 metara. Većina roditelja je izjavila da ne moraju da čekaju stomatološki pregled u domu zdravlja (76 slučajeva ili 36,4%), što je u skladu sa odgovorima rukovodilaca stomatoloških službi. Međutim, u 32 (15,3%) slučaja ispitanici su izjavili da moraju da čekaju duže od 10 dana.

Većina dece redovno posećuje preventivnog stomatologa, odnosno potpuno u 124 (59,3%) slučajeva i delimično u 70 (33,5%) slučajeva, dok u 15 (7,2%) slučajeva deca ne posećuju redovno preventivnog stomatologa.

Table 6. Regularity of visits to the preventive dentist

at the primary healthcare center, while 42 (20.1%) of the respondents stated that they are available partially. The distance from the facility where preventive dental services are provided is around 1,000 meters in most cases (62 cases or 29.7%), in 56 (26.8%) cases the distance is more than 2,000 meters, it amounts to 2,000 meters in 48 (23.0%) cases, and in 41 (19.6%) cases it is around 500 meters. A majority of parents stated that they do not have to wait for a dental examination at the primary healthcare center (76 cases or 36.4%), which is in line with the answers given by the heads of dental services. However, in 32 (15.3%) cases respondents stated having to wait for more than 10 days.

Most children regularly visit a preventive dentist, i.e., fully in 124 (59.3%) cases and partially in 70 (33.5%) cases, while in 15 (7.2%) cases children do not visit a preventive dentist regularly.

The greatest number of children (86 or 41.1%) visit a preventive dentist every 6 months, 63 (30.1%) children visit a preventive dentist every three months, and the least number of children (45 or 21.5%) visit the dentist every 12 months. A total of 15 (7.2%) parents did not answer this question. A majority of parents stated that they also personally have preventive dental examinations: always (123 cases or 58.9%) and partially (68 cases 32.5%), while 18 (8.6%) respondents do not have these examinations.

Tabela 7. Značaj dobijanja informacija o zdravlju zuba u obdaništima/školama i predlozi za unapređenje preventivne stomatološke zaštite

		n	%
Da li ste upoznati sa tim da li vaše dete dobija informacije o važnosti zdravlja zuba u obdaništu/školi? / Are you aware whether your child receives information about the importance of dental health in kindergarten/school?	Da / Yes	89	42.6
	Delimično / Partially	68	32.5
	Ne / No	52	24.9
Predlozi za unapređenje obavljanja preventivnih stomatoloških pregleda / Suggestions for improving the performance of preventive dental examinations	Organizovanje redovnih sistematskih pregleda svakih 6 meseci za decu uzrasta 4-12 godina / Organizing regular check-ups every 6 months for children aged 4-12 years	115	55.0
	Obezbeđivanje mesečnih stomatoloških pregleda deci u obdaništima i školama od strane stomatoloških tehničara i medicinskih tehničara / Providing monthly dental examinations of children in kindergartens and schools by dental technicians and nurse-technicians	69	33.0
	Obezbeđivanje većeg broja stomatoloških timova u javnim ustanovama / Providing a greater number of dental teams in public institutions	64	30.6
	Pružanje više informacija roditeljima o značaju zdravlja zuba (mediji i sl.) / Providing more information to parents about the importance of dental health (media, etc.)	20	9.6

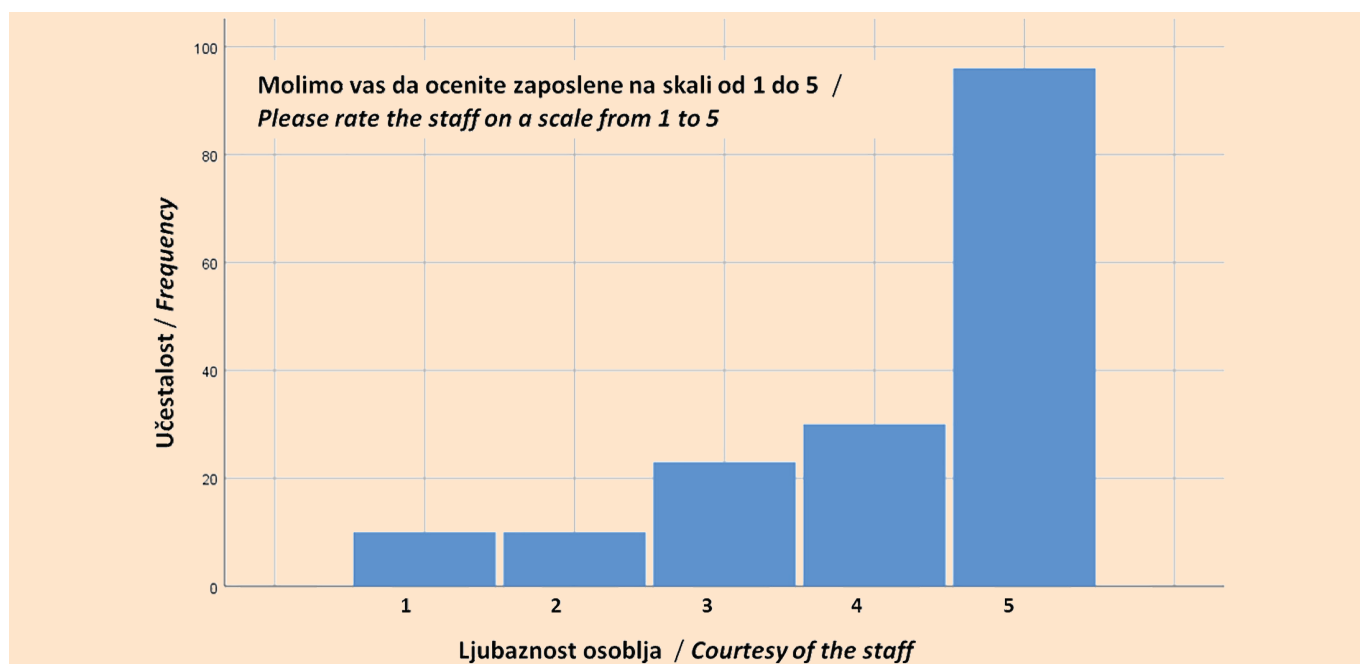
Najveći broj dece (86 ili 41,1%) posećuje preventivnog stomatologa svakih 6 meseci, 63 (30,1%) dece posećuje preventivnog stomatologa svaka tri meseca, a najmanje dece (45 ili 21,5%) posećuje stomatologa svakih 12 meseci. Na ovo pitanje nije odgovorilo ukupno 15 (7,2%) roditelja. Većina roditelja je izjavila da i lično obavlja preventivne stomatološke preglede: uvek (123 slučaja ili 58,9%) i delimično (68 slučajeva ili 32,5%), dok 18 (8,6%) ispitanika ne obavlja ove preglede.

Parents most often perform preventive dental examinations every 6 months (77 cases or 36.8%) or every 12 months (59 cases or 28.2%). Only one parent reported being charged for the preventive dental examination at the primary healthcare center.

About three quarters of the parents are fully (89 or 42.6%) or partially (68 or 32.5%) aware of whether their child receives information about the importance of dental health in kindergarten/school. The rest (52 or 24.9%) answered in the negative.

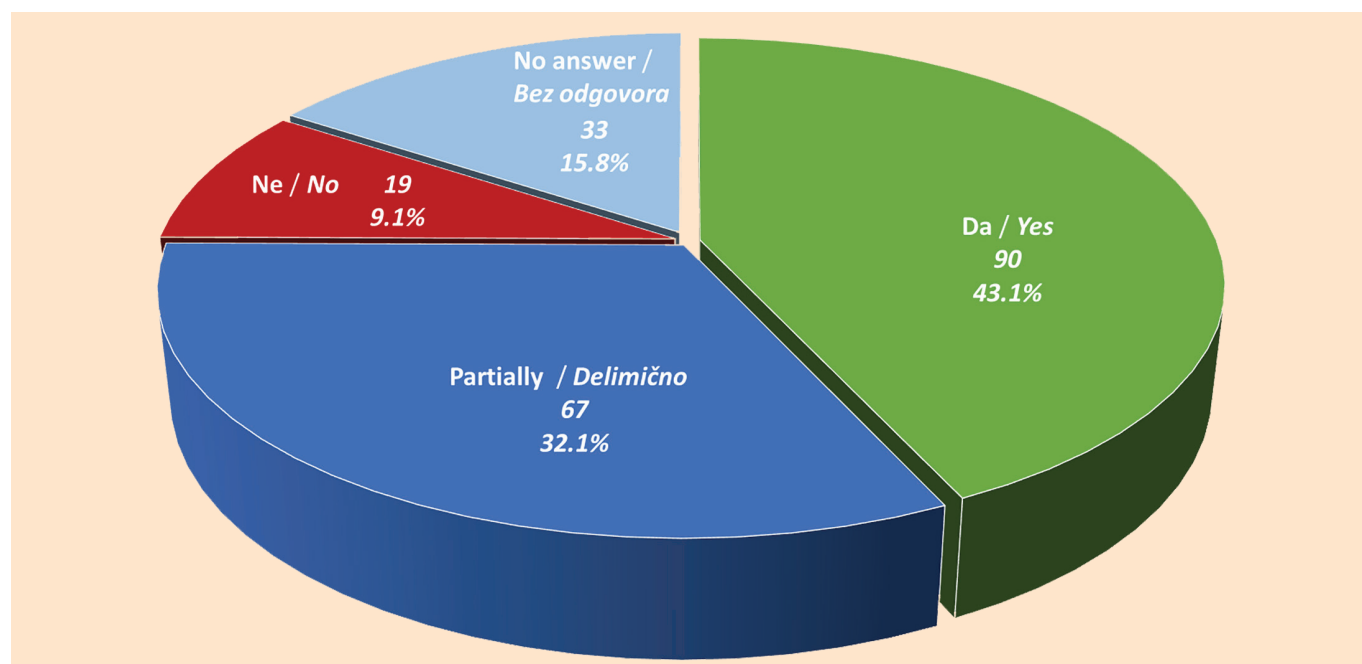
Grafikon 1. Analiza ljubaznosti osoblja stomatoloških službi u domovima zdravlja

Figure 1. Analysis of the friendliness of the staff of dental services at the primary healthcare centers



Grafikon 2. Analiza zadovoljstva profesionalnim radom osoblja u stomatološkim službama doma zdravlja

Figure 2. Analysis of satisfaction with the professionalism and work of the staff in the dental services of the primary healthcare center



Roditelji najčešće preventivne stomatološke preglede obavljaju svakih 6 meseci (77 slučajeva ili 36,8%) ili svakih 12 meseci (59 slučajeva ili 28,2%). Samo jedan roditelj prijavio je da mu je naplaćen preventivni stomatološki pregled u domu zdravlja.

Oko tri četvrtine roditelja je u potpunosti (89 ili 42,6%) ili delimično (68 ili 32,5%) upoznato sa tim da li njihovo dete dobija informacije o važnosti zdravlja zuba u vrtiću/školi. Preostali roditelji (52 ili 24,9%) su dali negativan odgovor.

Među predlozima za unapređenje preventivne stomatološke zaštite roditelji su najčešće navodili „Organizovanje redovnih sistematskih pregleda svakih 6 meseci za decu uzrasta 4-12 godina“ (115 slučajeva ili 55,0%), slede predlozi „Obezbeđivanje mesečnih stomatoloških pregleda deci u obdaništima i školama od strane stomatoloških tehničara i medicinskih tehničara“ (69 ispitanika ili 33,0%), „Obezbeđivanje većeg broja stomatoloških timova u javnim ustanovama“ (64 slučaja ili 30,6%), a najmanje ispitanika je predložilo „Pružanje više informacija roditeljima o značaju zdravlja zuba (mediji i sl.)“, (20 ispitanika ili 9,6%).

Ukupno 169 roditelja ocenilo je ljubaznost osoblja stomatološke službe doma zdravlja visokom prosečnom ocenom od $4,14 \pm 1,21$, na skali od 1 do 5.

Skoro 80% roditelja je izjavilo da je zadovoljno profesionalnim radom osoblja u stomatološkoj službi doma zdravlja: potpuno (90 ispitanika ili 43,1%) i delimično (67 slučajeva ili 32,1%). Od svih ispitanika, 33 (15,8%) nije odgovorilo na ovo pitanje.

Among the proposals for improvement, parents most often stated “Organizing regular check-ups every 6 months for children aged 4-12 years” (115 cases or 55.0%), followed by the suggestion “Providing monthly dental examinations of children in kindergartens and schools by dental technicians and nurse-technicians” (69 respondents or 33.0%), “Providing a greater number of dental teams in public institutions” (64 cases or 30.6%), and the least number of respondents suggested “Providing more information to parents about the importance of dental health (media, etc.)”, (20 respondents or 9.6 %).

A total of 169 parents rated the friendliness of the staff of the dental service of the primary healthcare center, on a scale of 1 to 5, with a high average rating of 4.14 ± 1.21 .

Almost 80% of parents stated that they are satisfied with the professionalism and work of the staff in the dental service of the primary healthcare center: fully (90 respondents or 43.1%) and partially (67 cases or 32.1%). Of all the respondents, 33 (15.8%) did not answer this question.

DISCUSSION

Two questionnaires were analyzed for the purpose of this study. One questionnaire was for heads of dental services, and the other was for children's parents. Five respondents completed the questionnaire for heads of dental services.

DISKUSIJA

Za potrebe ovog istraživanja analizirana su dva upitnika. Jedan upitnik je bio za rukovodioce stomatoloških službi, a drugi za roditelje dece. Pet ispitanika je popunilo upitnik za rukovodioce stomatoloških službi.

Što se tiče prevencije oralnih bolesti, manje od polovine ispitanika je izjavilo da imaju strateški dokument o programu prevencije karijesa i unapređenja oralnog zdravlja u svojoj ustanovi, dok su svi ispitanici izjavili da imaju dobru saradnju sa školama po pitanju preventivnih usluga.

Zanimljivo je da je većina ispitanika (60,0%) istakla da bi diplomirana medicinska sestra sa dodatnom edukacijom iz preventivne stomatologije mogla da sprovodi prevenciju oralnih bolesti kod dece predškolskog i školskog uzrasta.

Takođe, većina ispitanika je izjavila da je zadovoljna nivoom znanja i obrazovanja osoblja u njihovoj ustanovi. Važno je istaći da su svi ispitanici izjavili da njihova ustanova pruža stomatološke usluge deci i adolescentima sa smetnjama u razvoju, a da arhitektonsko rešenje objekata omogućava pristup ovim pacijentima.

Upitnik za roditelje popunilo je ukupno 209 ispitanika, od čega 36 muškaraca i 173 žene. Većina ispitanika je bila starosti 35–54 godine.

Važno je istaći da je većina roditelja (80,7%) izjavila da njihova deca imaju naviku redovnog pranja zuba i održavanja oralne higijene. Takođe, što se tiče redovnog pranja zuba i održavanja oralne higijene kod roditelja, većina roditelja ima naviku redovnog pranja zuba.

Većina roditelja je navela da njihova deca često konzumiraju rafinisane šećere, dok nešto manje njih konzumira i gazirana pića. Manji broj ispitanika (6,7%) je potvrdio da njihovo dete ima neko stomatološko oboljenje, te da neka od dece (12,7%) koriste neku vrstu ortodontskog aparata.

Dostupnost stomatološke zdravstvene zaštite je na visokom nivou prema iskazima roditelja (139 ispitanika ili 67,8%). Samo 24 (11,7%) ispitanika je izjavilo da nema pristup stomatološkoj zdravstvenoj zaštiti.

U svojim odgovorima o vremenu čekanja na stomatološki pregled, većina roditelja je izjavila da ne moraju da čekaju na stomatološki pregled.

Veoma je važno dobiti informacije o značaju oralnog zdravlja u obdaništima/školama, a 43,4% ispitanika je izjavilo da je u potpunosti upoznato da li njihovo dete dobija informacije o značaju oralnog zdravlja.

Takođe, važno je da većina roditelja osoblje stomatološke službe doma zdravlja smatra veoma ljubaznim, dajući zaposlenima u ustanovi visoku prosečnu ocenu na skali od 1 do 5. Većina roditelja (51,1%) je zadovoljna profesionalnim radom stomatoloških službi, sledi 38,1% delimično zadovoljnih i 10,8% nezadovoljnih

Regarding the prevention of oral diseases, less than half of the respondents stated that they have a strategic document in place for a program of caries prevention and promotion of oral health in their institution while all respondents stated that they have good cooperation with schools regarding preventive services.

It is interesting to note that a majority of respondents (60.0%) pointed out that a graduate nurse with additional education in preventive dentistry could carry out prevention of oral diseases in preschool and school children.

Also, a majority of respondents stated that they are satisfied with the level of knowledge and education of the staff at their institution. It is important to point out that all respondents stated that their institution provides dental services for children and adolescents with developmental disabilities, and that the architectural design of the facilities enables access for these patients.

A total of 209 respondents filled out the questionnaire for parents, of whom 36 men and 173 women. Most respondents were aged 35–54.

It is important to point out that a majority of parents (80.7%) stated that their children have regular habits of brushing their teeth and maintaining oral hygiene. Also, regarding regular tooth brushing and maintaining oral hygiene in parents, most parents have regular teeth brushing habits.

Most parents stated that their children often consume refined sugars, while slightly fewer of them also consume carbonated drinks. A smaller number of respondents (6.7%) confirmed that their child has some dental disease, and that some of them (12.7%) use some type of orthodontic appliance.

The availability of dental health care is at a high level according to the parents (139 respondents or 67.8%). Only 24 (11.7%) of respondents stated that they do not have access to dental health care.

In their answers regarding the waiting time for a dental examination a majority of the parents stated that they do not have to wait for a dental examination.

It is very important to get information about the importance of oral health at kindergartens/schools, and 43.4% of the respondents stated that they are fully aware of whether their child is getting information about the importance of oral health.

Also, it is important that a majority of parents consider the staff of the dental services of the primary healthcare center to be very friendly, giving them a high average rating on a scale of 1 to 5. Most parents (51.1%) are satisfied with the professionalism and work of the dental services, followed by 38.1% of partially satisfied respondents and 10.8% of unsatisfied respon-

ispitanika. Preventivne stomatološke usluge u Domu zdravlja su besplatne o čemu govori i podatak da je samo jedan roditelj naveo da su mu preventivne stomatološke usluge naplaćene.

Najčešći predlozi za poboljšanje obavljanja preventivnih stomatoloških pregleda su: organizovanje redovnih sistematskih pregleda na svakih 6 meseci za decu uzrasta 4–12 godina (55,0%), obezbeđivanje mesečnih stomatoloških pregleda dece predškolskog i školskog uzrasta od strane zubnih tehničara i medicinskih tehničara (33,0%), te obezbeđivanje većeg broja stomatoloških timova u javnim ustanovama (30,6%).

Brčić, u svojoj studiji sprovedenoj 2021. godine, ističe da stomatološka služba Doma zdravlja Opštine Livno obezbeđuje sve uslove za kvalitetnu preventivnu zaštitu dece predškolskog i školskog uzrasta i njihovih roditelja, te da zastarela medicinska oprema i činjenica da je osoblje starije i sa višegodišnjim stažom nemaju uticaja na kvalitet preventivnih stomatoloških usluga [9].

U svojoj studiji iz 2023. godine, Bajrić i saradnici su dokazali da je zadatak preventivnih programa prepoznavanje pacijenata sa visokim rizikom od razvoja karijesa i primena individualnog pristupa u dijagnostici i terapiji [5]. Preventivne procedure obuhvataju profesionalno čišćenje uz upotrebu fluorida i esencijalno savetovanje o ishrani i ishrani [10]. U kliničkom radu, različiti testovi, kao što su plak test, *CRT bacteria* i *CRT* pufer test, mogu dokazati postojanje povećanog rizika od karijesa. Na ovaj način je moguće uvesti odgovarajuće preventivne mere u ranoj fazi [11]. Cilj svih preventivnih mera oralne higijene je da se ukloni što više plaka i što duže odloži njegovo ponovno formiranje. Sredstva kojima se to postiže su četkica za zube, pasta za zube, interdentalne četkice, zubni konac i antiseptici.

Roditelji koji počnu da peru zube svojoj deci pre druge godine, kao i veštine koje roditelji percipiraju u pranju zuba kao deo svakodnevne rutine njihove dece, povezuju se sa manjom incidencijom karijesa kod dece uzrasta do četiri godine. U svojoj studiji iz 2015. godine, Hubner i saradnici su potvrdili da angažovanje roditelja u osmišljavanju programa koji podržavaju pranje zuba kod odojčadi i male dece dovodi do pozitivnih rezultata, odnosno do 30% povećanja broja roditelja koji peru zube svojoj maloj deci dva puta dnevno, uz povećanje samopouzdanja roditelja i efikasnosti pranja zuba. Pranje zuba dva puta dnevno je jeftina strategija za smanjenje rizika od karijesa u detinjstvu. Programi za decu najmlađeg uzrasta mogu pomoći u obezbeđivanju prednosti pranja zuba za svu decu, pomažući roditeljima da svojoj deci usade važnost lične higijene [12]. Da bi se očuvalo oralno zdravlje dece, potrebno je zdravstvenim i vaspitnim procedurama uticati na usvajanje zdravih oblika ponašanja, u pogledu oralne higijene,

dents. Preventive dental services at the primary health-care center are free of charge, which is supported by the fact that only one parent stated that they were charged for preventive dental services.

The most common suggestions for improving the performance of preventive dental examinations are as follows: organizing regular check-ups every 6 months for children aged 4–12 years (55.0%), providing monthly dental examinations for kindergarten and school children by dental technicians and nurse-technicians (33.0%), and providing a greater number of dental teams in public institutions (30.6%).

In her study, carried out in 2021, Brčić points out that the dental service of the Primary Healthcare Center of the Livno Municipality provides all conditions for quality preventive care of preschool and school children and their parents, and that the outdated medical equipment and the fact that the staff are older and with many years of service have no influence on the quality of preventive dental services [9].

In their study from 2023, Bajrić et al. proved that the task of preventive programs is to recognize patients at high risk of developing caries, and to apply an individual approach to diagnostics and therapy [5]. Preventive procedures include professional cleaning with the use of fluoride, and essential nutritional and dietary counseling [10]. In clinical work, various tests, such as the plaque test, *CRT bacteria*, and *CRT* buffer, can prove the existence of an increased risk for caries. In this way, it is possible to introduce appropriate preventive measures at an early stage [11]. The goal of all preventive oral hygiene measures is to remove as much plaque as possible and delay its re-formation for as long as possible. The means by which this is achieved are a toothbrush, toothpaste, interdental brushes, dental floss, and antiseptics.

Parents who start brushing their children's teeth before the age of two, as well as the parents' perceived skills in brushing teeth as part of their children's daily routine, are associated with a lower incidence of caries in children aged four and younger. In their study from 2015, Huebner et al. confirmed that engaging parents in the design of programs that support brushing teeth in infants and young children leads to positive results, i.e. a 30% increase in the number of parents who brush their young children's teeth twice a day accompanied with an increased self-confidence of parents and the efficiency of tooth brushing. Brushing teeth twice a day is a low-cost strategy to reduce the risk of caries in childhood. Early childhood programs can be helpful in ensuring all children receive the benefits of tooth brushing by helping parents instill in their children the importance of personal hygiene [12]. In order to

fluorisanja, zdrave ishrane, redovnih poseta stomatologu. Zdravstvenim vaspitanjem potrebno je uticati na sve članove porodice, sa ciljem razvijanja veština neophodnih za pravilnu oralnu i stomatološku negu i povećanja motivacije za prevenciju oralnih bolesti [13]. Programi i inicijative za unapređenje oralnog zdravlja i prevenciju karijesa koji počinju da se sprovode na nacionalnom nivou trebalo bi da omoguće promene, podignu svest o značaju preventivnog delovanja i podstaknu revitalizaciju preventivne stomatološke zdravstvene zaštite u predškolskom i školskom uzrastu [14].

Brojni autori su u svojim originalnim člancima i sistematskim prikazima ukazivali da se većina oralnih bolesti može sprečiti, ali da je sa edukacijom i prevencijom oralnih bolesti potrebno početi od najranijeg uzrasta. Zato je neophodno kontinuirano prikupljati epidemiološke podatke, vršiti preglede literature, vršiti naučne analize preventivnih metoda, kako bi se mogli kreirati programi zasnovani na dokazima i pristupiti pitanju prevencije na multidisciplinarni način [7,15,16].

U svojoj studiji iz 2020. godine, Dimitrova i saradnici su istraživali temu individualnih programa zdravstvenog vaspitanja i motivacije za oralnu higijenu i ishranu kod dece uzrasta od 7 do 10 godina. Atif i saradnici objavili su sistematski pregled literature 2023. Obe ove studije su dokazale da stomatolozi imaju na raspolaganju različite oblike, načine i sredstva da motivišu decu i roditelje da brinu o svom oralnom zdravlju, kao što su različiti medijski sadržaji, radionice i prezentacije, koji, osim što su edukativni, podstiču kreativnost i interesovanje. Motivacija za podizanje svesti o zdravim navikama je dugoročan psihološki proces i zahteva kontinuiranu strategiju [17,18].

ZAKLJUČAK

Na osnovu rezultata studije, uspeli smo da dokažemo da se u Kantonu Sarajevo pruža kvalitetna i sigurna preventivna stomatološka zaštita predškolske i školske dece u javnom zdravstvu.

Na osnovu upitnika za rukovodioce stomatoloških službi, može se zaključiti da većina ustanova ima plan razvoja kadrova, da se svi zaposleni kontinuirano edukuju, te da u ustanovama postoji plan stručnog usavršavanja kadrova. Ovo govori u prilog kvalitetne usluge od strane obrazovanog osoblja.

Samo dve od tri ustanove imaju strateški dokument (politiku) za program prevencije karijesa i unapređenja oralnog zdravlja, što govori u prilog činjenici da treba više raditi na strateškom planiranju prevencije.

Na osnovu analize upitnika za roditelje, može se zaključiti da je preventivna stomatološka usluga u javnom sektoru u domu zdravlja u potpunosti dostupna skoro svoj deci.

preserve the oral health of children, it is necessary to influence the adoption of healthy forms of behavior, in terms of oral hygiene, the use of fluoridation, healthy nutrition, and regular visits to the dentist, through health and education procedures. Through health education, it is necessary to influence all family members, with the aim of developing the skills necessary for proper oral and dental care and increasing the motivation for preventing oral diseases [13]. Programs and initiatives for promoting oral health and caries prevention that are starting to be implemented at the national level should enable changes, raise awareness about the importance of preventive action, and encourage the revitalization of preventive dental health care at the preschool and school age [14].

Numerous authors, in their original articles and systematic reviews, have pointed out that most oral diseases can be prevented, but it is necessary to start with education and prevention of oral diseases from an early age. That is why it is necessary to continuously collect epidemiological data, carry out literature reviews, and perform scientific analyses of preventive methods, in order to be able to create evidence-based programs and approach the issue of prevention in a multidisciplinary manner [7,15,16].

In their study from 2020, Dimitrova et al. researched the topic of individual programs for health education and motivation for oral hygiene and nutrition in children aged 7 to 10 years. Atif et al. published a systematic literature review in 2023. Both of these studies have proven that dentists have at their disposal various forms, ways, and means to motivate children and parents to take care of their oral health, such as various media content, workshops, and presentations, which, in addition to being educational, stimulate creativity and interest. Motivation to raise awareness of healthy habits is a long-term psychological process and requires a continuous strategy [17,18].

CONCLUSION

Based on the results of the study, we were able to prove that quality and safe preventive dental care for preschool and school children in the public health sector is provided in the Canton of Sarajevo.

Based on the questionnaire for heads of dental services, it can be concluded that a majority of the institutions have a staff development plan, that all employees are continuously educated, and that the institutions have a personnel professional development plan in place. This speaks in favor of providing quality service by educated staff.

Only two out of three institutions have a strategic document (policy) for a program of caries prevention

Većina ispitanika je izjavila da ne čeka stomatološki pregled kod stomatologa u domu zdravlja. Procena roditelja o ljubaznosti osoblja u domu zdravlja je visoka, što ukazuje da je većina roditelja zadovoljna profesionalnim radom osoblja u stomatološkoj službi doma zdravlja.

Sukob interesa: Nije prijavljen.

LITERATURA / REFERENCES

- Ahmić, A. Uvod u stomatologiju s historijom i etikom. Univerzitet u Sarajevu. Sarajevo. 2018.
- Ivanković A, Rebac Z. Financing of dental health care in the Federation of Bosnia and Herzegovina. *Croat Med J.* 1999 Jun;40(2):166-74.
- Bajrić E, Kobašlija S, Huseinbegović A, Zukanović A, Marković N, Selimović-Dragaš M, et al. Predictors of dental fear and anxiety in 9-12-year-old children in Bosnia and Herzegovina. *Acta Stomatol Croat.* 2022 Sep;56(3):246-56. doi: 10.15644/asc56/3/3.
- Muratbegović A, Marković N, Ganibegović Selimović M. Molar incisor hypomineralisation in Bosnia and Herzegovina: aetiology and clinical consequences in medium caries activity population. *Eur Arch Paediatr Dent.* 2007 Dec;8(4):189-94. doi: 10.1007/BF03262595.
- Bajrić E, Arslanagić A, Zukanović A, Duratbegović D, Šaćić-Selmanović L, Katana E, et al. Dental caries experience in children in public kindergartens of Sarajevo, Bosnia and Herzegovina. *Acta Stomatol Croat.* 2023 Mar;57(1):32-42. doi: 10.15644/asc57/1/4.
- Hraste J, Gržić R. Uvod u stomatologiju. Sveučilište u Rijeci. Medicinski fakultet. Rijeka. 2006.
- Karamahmedović E, Bajrić E, Virtanen JI. Oral health behaviour of nine-year-old children and their parents in Sarajevo. *Int J Environ Res Public Health.* 2021 Mar 21;18(6):3235. doi: 10.3390/ijerph18063235.
- Welbury RR, Duggal MS, Hosey MT. Paediatric Dentistry. Oxford: Oxford University Press. 2005.
- Brčić Lj. Upravljanje kvalitetom u preventivnoj stomatološkoj djelatnosti na nivou Općine Livno. Završni rad. Sveučilište/Univerzitet „Vitez“ u Travniku. Vitez. 2021.
- Voza I, Capasso F, Calcagnile F, Anelli A, Corridore D, Ferrara C, et al. School-age dental screening: oral health and eating habits. *Clin Ter.* 2019 Jan-Feb;170(1):e36-40. doi: 10.7417/CT.2019.2105.
- Khan MW, Cruz de Jesus V, Mittermuller BA, Sareen S, Lee V, Schroth RJ, et al. Role of socioeconomic factors and interkingdom crosstalk in the dental plaque microbiome in early childhood caries. *Cell Rep.* 2024 Aug 27;43(8):114635. doi: 10.1016/j.celrep.2024.114635.
- Huebner CE, Milgrom P. Evaluation of a parent-designed programme to support tooth brushing of infants and young children. *Int J Dent Hyg.* 2015 Feb;13(1):65-73. doi: 10.1111/idh.12100.
- Šaćić L, Marković N, Arslanagić Muratbegović A, Zukanović A, Kobašlija S. The prevalence and severity of early childhood caries in preschool children in the Federation of Bosnia and Herzegovina. *Acta Med Acad.* 2016 May;45(1):19-25. doi: 10.5644/ama2006-124.152.
- Heller LS, Pithavadian R, Micheal S, Chandio N, Sanagavarapu P, Parmar J, et al. Parental perceptions of an oral health promotion program in early childhood education and care settings: A qualitative study. *J Public Health Dent.* 2024 Dec;84(4):407-19. doi: 10.1111/jphd.12641.
- Elsadek YE, Baker SR. Oral health promotion through health-promoting schools in developing countries: A scoping review. *Community Dent Oral Epidemiol.* 2023 Dec;51(6):1197-208. doi: 10.1111/cdoe.12864.
- Geetha Priya PR, Asokan S, Janani RG, Kandaswamy D. Effectiveness of school dental health education on the oral health status and knowledge of children: A systematic review. *Indian J Dent Res.* 2019 May-Jun;30(3):437-49. doi: 10.4103/ijdr.IJDR_805_18.
- Dimitrova M, Tankova H, Rashkova M. Individual program for health education and motivation for oral hygiene and nutrition in children aged 7 to 10 years. *Problems of dental medicine.* 2020;46(2):28-36.
- Atif M, Tewari N, Saji S, Srivastav S, Rahul M. Effectiveness of various methods of educating children and adolescents for the maintenance of oral health: A systematic review of randomized controlled trials. *Int J Paediatr Dent.* 2024 May;34(3):229-45. doi: 10.1111/ipd.13125.

and promotion of oral health, which speaks in favor of the fact that more work should be done on strategic prevention planning.

Based on the analysis of the questionnaire for parents, it can be concluded that the preventive dental service in the public sector at the primary healthcare center is fully available for almost all children.

Most respondents stated that they do not wait for a dental examination at the dentist in the primary healthcare center. The parents' assessment of the friendliness of the staff at the public primary healthcare center yielded a high score, indicating that a majority of parents were satisfied with the professionalism and work of the staff in the dental service of the primary healthcare center.

Conflict of interest: None declared.

EJEKCIJNA FRAKCIJA LEVE KOMORE I ANTEROPOSTERIORNI DIJAMETAR LEVE PRETKOMORE KAO PREDIKTORI ISHODA AKUTNOG ISHEMIJSKOG MOŽDANOG UDARA

ORIGINALNI RAD

ORIGINAL ARTICLE

THE LEFT VENTRICULAR EJECTION FRACTION AND THE LEFT ATRIAL ANTEROPOSTERIOR DIAMETER AS PREDICTORS OF ACUTE ISCHEMIC STROKE OUTCOME

Dejan Munjiza¹, Biljana Georgievski-Brkić^{1,2}, Filip Vitošević¹, Marjana Vukićević^{1,2}

¹ Specijalna bolnica „Sveti Sava“, Beograd, Srbija

¹ Special Hospital "Sveti Sava", Belgrade, Serbia

² Univerzitet u Kragujevcu, Fakultet medicinskih nauka, Kragujevac, Srbija

² University of Kragujevac, Faculty of Medical Sciences, Kragujevac, Serbia

SAŽETAK

Uvod: Akutni moždani udar predstavlja značajno zdravstveno opterećenje. Kako su varijable dobijene transtorakalnom ehokardiografijom dokazani prediktori ishoda kardioloških oboljenja, pokušali smo da utvrdimo njihov značaj u predikciji ishoda ove grupe bolesnika.

Cilj rada je dokazivanje hipoteze da je uvećanje leve pretkomore iskazano porastom anteroposteriornog dijametra kao i pad sistolne funkcije leve komore, posmatran vrednošću ejeckione frakcije, prediktor lošeg ishoda kod ovih bolesnika.

Materijali i metode: Osnov metodologije je analiza podataka 106 bolesnika sa akutnim ishemijskim moždanim udarom uz podatke o modifikovanom Rankin skor u otpustu, koji su pokazatelj funkcionalnog ishoda oboljenja.

Rezultati: Pokazana je korelacija između funkcionalnog ishoda bolesti u odnosu na ejeckionu frakciju leve komore. Opadanjem ejeckione frakcije leve komore raste mogućnost lošijeg ishoda bolesti. Veličina leve pretkomore je takođe testirana kao prediktor lošijeg ishoda u smislu veće leve pretkomore povezane sa lošijim ishodom bolesti, a hipoteza se i ovde pokazala tačnom, s obzirom da postoji korelacija veličine njenog prečnika u odnosu na ishod bolesti.

Zaključak: Od praćenih parametara, prediktivnu vrednost ka ishodu bolesti pokazuje ejeckiona frakcija leve komore, kao i veličina levog atrijuma, a u odnosu na funkcionalni ishod bolesti.

Ključne reči: moždani udar, ejeckiona frakcija, leva pretkomora

ABSTRACT

Introduction: Acute stroke represents a significant health burden. Since the variables obtained by transthoracic echocardiography are proven predictors of the outcome of cardiac diseases, we tried to determine their importance in predicting the outcome of this group of patients.

The aim of the work is to prove the hypothesis that the enlargement of the left atrium, expressed by the increase in the anteroposterior diameter and the decrease in the systolic function of the left ventricle, as observed by the value of the ejection fraction, predict a bad outcome in these patients.

Materials and methods: The methodology is based on the data analysis of 106 patients with acute ischemic stroke, including data on the modified Rankin score at discharge, which indicates the disease's functional outcome.

Results: A correlation was shown between the functional outcome of the disease in relation to the ejection fraction of the left ventricle. As the ejection fraction of the left ventricle decreases, the possibility of a worse disease outcome increases. The size of the left atrium was also tested as a predictor of a worse outcome in terms of a larger left atrium associated with a worse outcome of the disease, and the hypothesis proved to be correct here as well, given that there is a correlation between the size of its diameter and the outcome of the disease.

Conclusion: The monitored parameters, the left ventricular ejection fraction and the left atrium size, show predictive value for the disease's functional outcome.

Keywords: stroke, ejection fraction, left atrium

Autor za korespondenciju:
Dejan Munjiza
Specijalna bolnica „Sveti Sava“
Nemanjina broj 2, 11000 Beograd, Srbija
Elektronska adresa: munjizad@gmail.com

Corresponding author:
Dejan Munjiza
Special hospital "Sveti Sava"
2 Nemanjina Street, 11000 Belgrade, Serbia
E-mail: munjizad@gmail.com

Primljeno • Received: November 27, 2024; **Revidirano • Revised:** December 18, 2024; **Prihvaćeno • Accepted:** December 20, 2024; **Online first:** December 31, 2024

DOI: 10.5937/smclK5-55038

UVOD

U globalu, moždani udar je ostao drugi vodeći uzrok smrti i treći vodeći uzrok smrti i invaliditeta zajedno, u svetu [1]. Takođe, projekcije pokazuju da će se stopa incidence ishemijskog moždanog udara povećavati kod oba pola u svim starosnim grupama između 2020. i 2030. godine u zemljama sa niskim dohotkom [2]. Bolesnost predstavlja četvrti uzrok smrtnosti u Sjedinjenim Američkim Državama [3]. Od 1990. do 2019. godine, incidenca moždanog udara je u porastu paralelno sa rastom smrtnosti od moždanog udara, a tokom istog perioda starosno standardizovane stope incidence su se smanjile [1].

Uobičajeni faktori rizika za aterosklerozu predstavljaju i rizikofaktore za ishemijski moždani udar te, kako je iz prakse i poznato, moždani udar uobičajeno ima više kardioloških komorbiditeta. Kako su dobro definisane varijable dobijene transtorakalnom ehokardiografijom ujedno i dokazani prediktori ishoda kardioloških oboljenja [4-7], ovde smo pokušali da utvrdimo njihov značaj u predikciji ishoda kod bolesnika sa akutnim ishemijskim moždanim udarom.

Cilj rada je da se proceni povezanost jasno definisanih ehokardiografskih varijabli na funkcionalni ishod bolesnika sa ishemijskim moždanim udarom, odnosno testiranje hipoteze da je uvećanje leve pretkomore, iskazano porastom anteroposteriornog (AP) dijametra, kao i pad sistolne funkcije leve komore, posmatran vrednošću ejeckione frakcije, prediktor lošeg ishoda kod bolesnika sa akutnim ishemijskim moždanim udarom.

MATERIJALI I METODE

Pregled i analiza podataka dobijenih retrospektivnom studijom relevantnih varijabli iz istorija bolesti 106 bolesnika sa ishemijskim moždanim udarom, lečenih u periodu od 1. februara 2023. godine do 1. avgusta 2023. godine u Specijalnoj bolnici „Sveti Sava“. Prikupljeni su demografski podaci o polu i starosti ispitanika uz selektovane parametre transtorakalnih ehokardiografskih studija, odnosno varijable sistolne funkcije leve komore iskazane kroz vrednost ejeckione frakcije (LVEF) merene Simpsonovom metodom, kao i anteroposteriorni dijametar (AP) levog atrijuma vizuelizacijom u parasternalnom uzdužnom preseku (PLAX). Takođe i rezultate modifikovane Rankin skale na otpustu kao varijable ishoda oboljenja, a koja predstavlja rutinsku i klinički najfrekventniju skalu za procenu invaliditeta nakon moždanog udara. Kategorije modifikovanog Rankin skora prikazane su u **Tabeli 1**, dok grafički prikaz raspodele bolesnika ilustruje **Grafikon 1**.

Zavisno od tipa varijabli i normalnosti raspodele, deskripcija podataka prikazana je kao n (%), aritmetička sredina $\pm$ standardna devijacija ($as \pm sd$) ili medijana

INTRODUCTION

Globally, stroke remains the second leading cause of death and the third leading cause of death and disability combined [1]. Projections also indicate that the incidence rate of ischemic stroke will increase among both genders across all age groups in low-income countries between 2020 and 2030 [2]. Stroke is the fourth leading cause of mortality in the United States [3]. From 1990 to 2019, the incidence of stroke has risen in parallel with an increase in stroke-related mortality, although age-standardized incidence rates have declined during the same period [1].

Common risk factors for atherosclerosis are also risk factors for ischemic stroke. As clinical experience shows, stroke often presents with multiple cardiac comorbidities. Since well-defined variables obtained through transthoracic echocardiography are proven predictors of cardiovascular outcomes [4-7], this study aimed to determine their significance in predicting outcomes in patients with acute ischemic stroke.

The objective of this study was to evaluate the association of clearly defined echocardiographic variables with the functional outcome of patients with ischemic stroke, specifically testing the hypothesis that left atrial enlargement, indicated by an increase in the anteroposterior (AP) diameter, as well as reduced left ventricular systolic function, reflected by ejection fraction values, are predictors of poor outcomes in patients with acute ischemic stroke.

MATERIALS AND METHODS

The study involved a retrospective review and analysis of data collected from 106 patients with ischemic stroke treated between February 1, 2023, and August 1, 2023, at the Specialized Hospital "Sveti Sava." Demographic data on the sex and age of the participants were collected, along with selected parameters from transthoracic echocardiographic studies, respectively variables of left ventricular systolic function expressed through the left ventricular ejection fraction (LVEF) measured using Simpson's method, as well as the anteroposterior diameter (AP) of the left atrium visualized in the parasternal long-axis view (PLAX). Additionally, the modified Rankin Scale scores at discharge, which serve as outcome variables and represent the most commonly used clinical scale for disability assessment after stroke, were analyzed. The categories of the modified Rankin score are presented in **Table 1**, with a graphical distribution illustrated in **Figure 1**.

Depending on the type of variables and the normality of distribution, data were described as n (%), mean $\pm$ standard deviation (mean $\pm$ SD), or median (range, min-max). Spearman's correlation coefficient

Tabela 1. Modifikovan Rankin skor

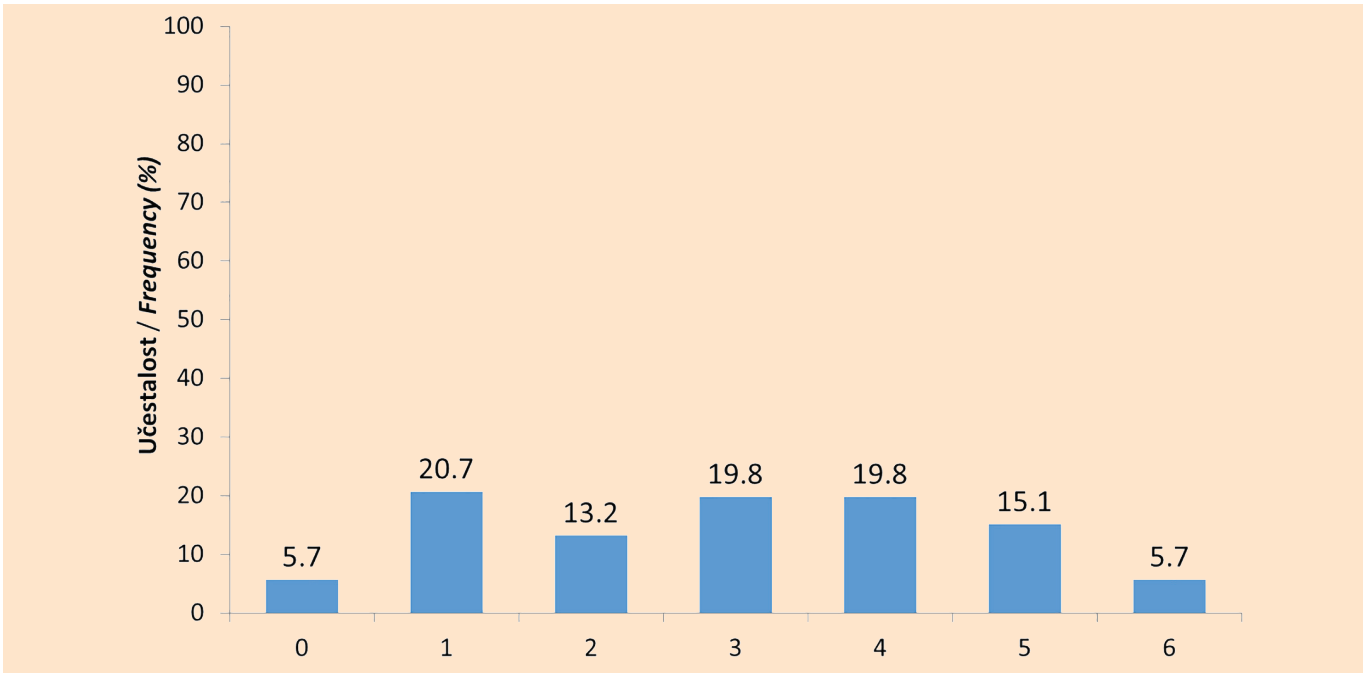
mRS	Opis / Description	n (%)
0	Bez simptoma / No symptoms	6 (5.7%)
1	Bez značajne onesposobljenosti – sposoban za obavljanje svih aktivnosti / No significant disability – able to carry out all activities	22 (20.7%)
2	Laka onesposobljenost – sposoban za samozbrinjavanje ali ne i za sve premorbidne aktivnosti / Slight disability – able to look after own affairs but not capable of all pre-stroke activities	14 (13.2%)
3	Umerena onesposobljenost – zahteva pomoć ali sposoban za samostalni hod / Moderate disability – requires help but able to walk independently	21 (19.8%)
4	Umereno teška onesposobljenost – nije sposoban za samostalni hod / Moderately severe disability – unable to walk independently	21 (19.8%)
5	Teška onesposobljenost – nepokretan i kompletno zavisn od tuđe nege i pomoći / Severe disability – bedridden and completely dependent on care	16 (15.1%)
6	Smrt / Death	6 (5.7%)
UKUPNO / TOTAL		106 (100%)

Table 1. Modified Rankin Scale

mRS	Opis / Description	n (%)
0	Bez simptoma / No symptoms	6 (5.7%)
1	Bez značajne onesposobljenosti – sposoban za obavljanje svih aktivnosti / No significant disability – able to carry out all activities	22 (20.7%)
2	Laka onesposobljenost – sposoban za samozbrinjavanje ali ne i za sve premorbidne aktivnosti / Slight disability – able to look after own affairs but not capable of all pre-stroke activities	14 (13.2%)
3	Umerena onesposobljenost – zahteva pomoć ali sposoban za samostalni hod / Moderate disability – requires help but able to walk independently	21 (19.8%)
4	Umereno teška onesposobljenost – nije sposoban za samostalni hod / Moderately severe disability – unable to walk independently	21 (19.8%)
5	Teška onesposobljenost – nepokretan i kompletno zavisn od tuđe nege i pomoći / Severe disability – bedridden and completely dependent on care	16 (15.1%)
6	Smrt / Death	6 (5.7%)
UKUPNO / TOTAL		106 (100%)

Grafikon 1. Distribucija ispitanika među kategorijama modifikovanog Rankin skora po relativnim učestalostima

Figure 1. The distribution of participants across the categories of the modified Rankin Scale by relative frequencies



(opseg, min – max). Za procenu povezanosti modifikovanog Rankin skora sa ostalim varijablama korišćen je Spirmanov koeficijent korelacije. Statističke hipoteze su testirane na nivou statističke značajnosti (alfa nivo) od 0,05. Svi podaci su obrađeni u softverskom paketu IBM SPSS Statistics 24 (SPSS Inc, Chicago, IL, USA).

REZULTATI

U studiju je uključeno 106 bolesnika sa akutnim ishemijskim moždanim udarom prosečne starosti oko 69 godina (69,2 godine sa standardnom devijacijom 12,1 godina), od čega je nešto više od trećine ženskog pola (68 ispitanika muškog i 38 ženskog pola). Najmlađi bo-

assessed the association between the modified Rankin score and other variables. Statistical hypotheses were tested at a significance level (alpha level) of 0.05. All data were processed using IBM SPSS Statistics 24 (SPSS Inc, Chicago, IL, USA).

RESULTS

The study included 106 patients with acute ischemic stroke, with an average age of approximately 69 years (69.2 years, standard deviation 12.1 years). A little over one-third of the patients were female (68 male and 38 female participants). The youngest patient was 35 years old, and the oldest was 90 years old. Table 2 provides an

Tabela 2. Sociodemografke varijable, faktori rizika i medijana ishoda bolesti

Table 2. Sociodemographic Variables, Risk Factors, and Median Disease Outcome

Variable / Variables	N = 106
Pol, n (%) / Gender, n (%)	
muški / male	68 (64.2%)
ženski / female	38 (35.8%)
Starost, as ± sd / Age, am ± sd	69.2 ± 12.1
Hipertenzija, n (%) / Hypertension, n (%)	96 (90.6%)
Atrijalna fibrilacija, n (%) / Atrial fibrillation, n (%)	34 (32.1%)
Dijabetes mellitus, n (%) / Diabetes mellitus, n (%)	28 (26.4%)
Hiperlipidemija, n (%) / Hyperlipidemia, n (%)	28 (26.4%)
Pušenje, n (%) / Smoking, n (%)	26 (24.5%)
Zloupotreba alkohola, n (%) / Alcohol abuse, n (%)	8 (7.5%)
Gojaznost, n (%) / Obesity, n (%)	10 (9.6%)
Rankin skor, medijana (opseg) / Rankin score, median (range)	2 (0–6)

AS – aritmetička sredina;
 sd – standardnu devijaciju

am – arithmetic mean;
 sd – standard deviation

lesnik je dobi 35 godina, a najstariji 90 godina. U **Tabeli 2** je dat prikaz sociodemografskih varijabli uzorka, kao i prikaz profila faktora rizika kod bolesnika uključenih u studiju. Kod svih ispitanika je urađena transtorakalna ehokardiografska studija koja definiše ejekcionu frakciju leve komore po Simpsonovoj metodi, uz anteroposteriori dijametar leve pretkomore iz duge parasternalne ose, uz dopunske varijable studije koje su prikazane u **Tabeli 3**.

Ejekciona frakcija leve komore, određena po Simpsonovoj metodi, kao univerzalni i široko rasprostranjen marker sistolne funkcije leve komore (LVEF), korišćena je kao prediktor ishoda oboljenja kod bolesnika sa akutnim ishemijskim moždanim udarom. Testiranje ishoda oboljenja u odnosu na ejekcionu frakciju leve komore je sprovedeno testirajući neparametarsku korelaciju ejekcione frakcije leve komore i ishoda bolesti prikazanog putem vrednosti modifikovanog Rankin skora.

Tabela 3. Ehokardiografski parametri

Table 3. Echocardiographic Parameters

Variable / Variables	N = 106
EDD, as ± sd / am ± sd	52.3 ± 5.02
ESD, as ± sd	35.06 ± 4.92
IVS, as ± sd	11.05 ± 1.83
ZZ, as ± sd	10.30 ± 1.69
LVEF, as ± sd	55.58 ± 10.63
AP, as ± sd	38.66 ± 10.22

AS – aritmetička sredina;
 sd – standardnu devijaciju

am – arithmetic mean;
 sd – standard deviation

overview of the sociodemographic variables of the sample, as well as the profile of risk factors among the patients included in the study. All participants underwent transthoracic echocardiographic studies, which measured left ventricular ejection fraction (LVEF) using Simpson's method, along with the anteroposterior diameter of the left atrium from the parasternal long axis view and additional echocardiographic variables presented in **Table 3**.

The left ventricular ejection fraction, determined by Simpson's method, as a universal and widely used marker of left ventricular systolic function (LVEF), was used as a predictor of disease outcome in patients with acute ischemic stroke. Testing disease outcomes in relation to left ventricular ejection fraction was conducted by analyzing the non-parametric correlation between the left ventricular ejection fraction and disease outcome, represented by the modified Rankin Scale score.

Testing, using Spearman's correlation, found that there is a lower degree of correlation between the outcome of the disease in relation to the LVEF with a negative sign ($r_s = -0.31$; $p = 0.001$; **Table 4**), i.e. that with a decrease in the degree of systolic ventricular function, expressed by the left ventricular ejection fraction using the Simpson method, the degree of functional disability of patients after acute ischemic stroke increases.

The size of the left atrium, expressed as its anteroposterior diameter in the parasternal long-axis view (PLAX), was also tested as a predictor of poorer outcomes. A larger left atrial diameter was associated with higher Rankin scores ($r_s = 0.24$; $p = 0.015$; **Table 4**), implying that an increase in the size of the left atrium

Tabela 4. Vrednosti Spirmanovog koeficijenta i verovatnoće

Table 4. Spearman's Coefficient Values and Probability

Variable / Variables	Povezanost / Correlation	Rankin / Rankin
LVEF	r_s	-0,31
	p	0,001
EDD	r_s	0,04
	p	0,700
ESD	r_s	0,14
	p	0,162
IVS	r_s	-0,12
	p	0,223
Godine / Age	r_s	0,10
	p	0,289
AP	r_s	0,24
	p	0,015
ZZ	r_s	-0,02
	p	0,881

Testiranjem, putem Spirmanove korelacije, ustanovljeno je da postoji manji stepen korelacije između ishoda bolesti u odnosu na LVEF sa negativnim predznakom ($r_s = -0,31$; $p = 0,001$; **Tabela 4**), tj. da opadanjem stepena sistolne komorske funkcije, izraženog ejectionom frakcijom leve komore Simpsonovom metodom, raste stepen funkcionalne onesposobljenosti bolesnika nakon akutnog ishemijskog moždanog udara.

Veličina leve pretkomore, izražena svojim anteroposteriornim dijametrom u dugoj parasternalnoj osi (PLAX preseku), takođe je testirana kao prediktor lošijeg ishoda u smislu veće pretkomore povezane sa lošijim ishodom bolesti. Viša vrednost ovog prečnika leve pretkomore je povezana sa višim stepenom Rankin skora ($r_s = 0,24$; $p = 0,015$; **Tabela 4**), odnosno porast veličine leve pretkomore implicira lošiji funkcionalni ishod kod bolesnika sa akutnim ishemijskim moždanim udarom.

Ostali testirani parametri ultrazvučne morfometrije leve komore, svaki zasebno, ne daju povezanost sa funkcionalnim ishodom akutnog moždanog udara.

DISKUSIJA

U studiju je uključeno 106 ispitanika oba pola prosečne starosti oko 69 godina koji su bolovali od akutnog ishemijskog moždanog udara. U uzorku dominiraju ispitanici muškog pola kojih je nešto manje od dve trećine (64,2%).

Među merenim, testiranim i analiziranim ultrazvučnim parametrima kod ove kohorte bolesnika, kao prediktor lošeg toka bolesti, sa manjim stepenom negativne korelacije, dokazala se LVEF merena Simpsonovom metodom. Dakle, niža LVEF favorizuje prognostički lošiji ishod bolesti. LVEF je širokoispitivani parametar kao prediktor smrti usled srčane insuficijencije i kardiovaskularne smrti uopšte [4-7], a u manjem broju ispitivanja i kao uzrok ishoda usled akutnog moždanog udara.

Postoje studije [7] koje su pokazale korelaciju između ishoda ishemijskog moždanog udara i veoma niskih vrednosti LVEF. Takođe, i drugi autori povezuju pad vrednosti LVEF sa lošijim ishodom bolesti [8-10]. Do istih rezultata, kao i u našoj grupi bolesnika, a u vezi asocijacije LVEF i ishoda akutnog ishemijskog moždanog udara pacijenata koji su podvrgnuti trombolitičkoj terapiji dolaze i drugi istraživači [11]. Nadalje, literatura dovodi u vezu redukovanu LVEF sa smanjenim jednogodišnjim preživljavanjem kod bolesnika sa akutnim ishemijskim moždanim udarom ili tranzitornim ishemijskim atakom [12,13]. Dakle, rezultati drugih autora su skladni sa analizom našim podataka.

Sa druge strane, dimenzija leve pretkomore, kao prediktor ishoda akutnog ishemijskog moždanog udara, testirana je zbog povezanosti uvećanja leve pretkomore sa porastom incidence atrijalne fibrilacije, kao dokazanog rizikofaktora za akutni ishemijski moždani udar.

is associated with a worse functional outcome in patients with acute ischemic stroke.

When analyzed individually, other echocardiographic parameters of left ventricular morphometry did not show any significant association with functional outcomes following acute stroke.

DISCUSSION

The study included 106 patients of both genders with acute ischemic stroke, with an average age of approximately 69 years. The sample was predominantly male, accounting for just under two-thirds of the participants (64.2%).

Among the measured, tested, and analyzed echocardiographic parameters in this patient cohort, LVEF measured by Simpson's method was identified as a predictor of poor disease progression, showing a slight negative correlation. In other words, lower LVEF is associated with a prognostically worse disease outcome. LVEF is a widely studied parameter as a predictor of mortality due to heart failure and cardiovascular death in general [4-7], but it has been less frequently investigated in the context of outcomes following acute stroke.

Some studies [7] have demonstrated a correlation between ischemic stroke outcomes and very low LVEF values. Other researchers have similarly linked reduced LVEF to poorer disease outcomes [8-10]. Consistent with our findings, other studies investigating the association between LVEF and outcomes in patients undergoing thrombolytic therapy for acute ischemic stroke have reported similar results [11]. Additionally, the literature associates reduced LVEF with decreased one-year survival in patients with acute ischemic stroke or transient ischemic attack [12,13]. Thus, our findings align with those reported by other researchers.

On the other hand, left atrial size was tested as a predictor of acute ischemic stroke outcomes due to its association with increased incidence of atrial fibrillation, a well-established risk factor for acute ischemic stroke. Since atrial fibrillation is a known risk for systemic and cardiac embolization, the hypothesis was formed that an enlarged left atrium, as a pathomorphological substrate, would be statistically significantly more common in the group of patients with worse outcomes and correlate with disease outcome; this was confirmed through testing.

Most of the literature focuses on investigating the relationship between left atrial size, particularly its enlargement, as a risk factor for acute ischemic stroke. Meta-analyses have demonstrated that an increase in left atrial size significantly raises the risk of developing

Kako je atrijska fibrilacija dobro definisan rizik sistemske, pa tako i kardijalne embolizacije, pošlo se od hipoteze da uvećana leva pretkomora, kao patomorfološki susprat, treba da bude statistički značajno češća u grupi bolesnika sa lošijim ishodom bolesti i da bude u korelaciji sa ishodom, što je testiranjem ovde i dokazano.

Naime, većina literature se bazira na istraživanje odnosa veličine leve pretkomore, odnosno njenog uvećanja, kao rizikofaktora za akutni ishemijski moždani udar. Na osnovu meta-analize istraživanja dokazano je da porast veličine leve pretkomore značajno povećava rizik od razvoja akutnog ishemijskog rizika, ali bez analize njene veličine kao faktora predikcije ishoda bolesti [14,15].

Istom temom su se, iako u malom broju, bavili i drugi autori koji ispituju odnos morfologije levog atrijuma i predikcije ishoda akutnog ishemijskog moždanog udara. Jedno od istraživanja je demonstriralo da prečnik leve pretkomore ima nezavisnu vezu sa smrtnošću od svih uzroka, uključujući i akutni ishemijski moždani udar, kod oba pola [16]. Ovde nije posmatran akutni ishemijski moždani udar kao izolovana varijabla već kao deo ukupne kardiovaskularne smrti, tako da je ovo polje koje treba istražiti dodatno na većem uzorku, s obzirom da se radi o masovnom nezaraznom oboljenju.

Limit studije je potreba da se testira uticaj ostalih komorbiditeta, kao i same starosti ispitanika na funkcionalni ishod akutnog ishemijskog moždanog udara, što je naš dalji zadatak koji se može ostvariti daljim proširenjem uzorka.

ZAKLJUČAK

Od praćenih ultrazvučnih parametara, prediktivnu vrednost ka ishodu bolesti pokazuje LVEF određena metodom po Simpsonu. Naime, postoji statistički značajna povezanost između veličine LVEF između grupa bolesnika u odnosu na funkcionalni ishod akutnog ishemijskog moždanog udara i to tako što pad vrednosti ejekcione frakcije favorizuje lošiji funkcionalni ishod moždanog udara.

Veličina levog atrijuma, iskazana anteroposteriornim dijametrom merenim u PLAX preseku, pokazala je značajnu povezanost u odnosu na funkcionalni ishod akutnog ishemijskog moždanog udara, sa pozitivnim predznakom, odnosno porast veličine prečnika leve pretkomore favorizuje lošiji funkcionalni ishod.

Moždani udar je gotovo uvek deo spektra kardiovaskularnih poremećaja koji uvek utiču na način lečenja bolesnika, koji je u savremenim uslovima individualizovan, ali uz poštovanje principa dobre kliničke prakse lečenja kako moždanog udara tako i svih pratećih komorbiditeta paralelno. Dakle, radi se o multimorbidnom stanju gde postoji medjusobni uticaj patoloških stanja jednih na druge, što rezultira u potrebi za po-

acute ischemic stroke, but without analyzing its size as a predictor of disease outcomes [14,15].

Some authors, albeit in limited numbers, have also examined the relationship between left atrial morphology and prediction of acute ischemic stroke outcomes. One study demonstrated that left atrial diameter has an independent association with all-cause mortality, including acute ischemic stroke, in both genders [16]. However, in that study, acute ischemic stroke was not considered an isolated variable but rather part of overall cardiovascular mortality. This indicates a need for further research in this area with larger sample sizes, given the prevalence of this non-communicable disease.

A limitation of this study is the need to assess the impact of other comorbidities and the age of participants on the functional outcome of acute ischemic stroke. This represents a further objective for future research, which could be achieved by expanding the sample size.

CONCLUSION

The left ventricular ejection fraction determined by the Simpson method has a predictive value for the disease outcome of the monitored ultrasound parameters. Namely, there is a statistically significant relationship between the size of the LVEF between groups of patients in relation to the functional outcome of acute ischemic stroke, and that is because a decrease in the value of the ejection fraction favors a worse functional outcome of the stroke.

The size of the left atrium, expressed as the anteroposterior diameter measured in the PLAX view, also significantly correlated with the functional outcome of acute ischemic stroke. This correlation had a positive sign, meaning an increased left atrial diameter is associated with a worse functional outcome.

Stroke is almost always part of the spectrum of cardiovascular disorders that always affect the way patients are treated, which in modern conditions is individualized, but with respect to the principles of good clinical practice of treating both stroke and all accompanying comorbidities in parallel. Therefore, it is a multimorbid condition where there is an influence of pathological conditions on each other, which results in the need for the aforementioned individualization of therapy, and therefore, stroke should always be viewed as a part of the cardiovascular "puzzle."

menutim individualizovanjem terapije te zato moždani udar uvek treba posmatrati kao deo kardiovaskularne „slagalice“.

SPISAK SKRAĆENICA

LVEF – Ejekciona frakcija leve komore
AP – Anteroposteriorni dijametar levog atrijuma
PLAX – Parasternalni uzdužni presek
EDD – Enddiastolni dijametar leve komore
ESD – Endsistolni dijametar leve komore
IVS – Debljina interventrikularnog septuma
ZZ – Debljina zadnjeg zida leve komore

Sukob interesa: Nije prijavljen.

LITERATURA / REFERENCES

1. GBD 2019 Stroke Collaborators. Global, regional, and national burden of stroke and its risk factors, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet Neurol.* 2021 Oct;20(10):795-820. doi: 10.1016/S1474-4422(21)00252-0.
2. Pu L, Wang L, Zhang R, Zhao T, Jiang Y, Han L. Projected global trends in ischemic stroke incidence, deaths and disability-adjusted life years from 2020 to 2030. *Stroke.* 2023 May;54(5):1330-9. doi: 10.1161/STROKEAHA.122.040073.
3. Imoisili OE, Chung A, Tong X, Hayes DK, Loustalot F. Prevalence of stroke – behavioral risk factor surveillance system, United States, 2011-2022. *MMWR Morb Mortal Wkly Rep.* 2024 May 23;73(20):449-55. doi: 10.15585/mmwr.mm7320a1.
4. Toma M, Ezekowitz JA, Bakal JA, O'Connor CM, Hernandez AF, Sardar MR, et al. The relationship between left ventricular ejection fraction and mortality in patients with acute heart failure: insights from the ASCEND-HF Trial. *Eur J Heart Fail.* 2014 Mar;16(3):334-41. doi: 10.1002/ehf.19.
5. Solomon SD, Anavekar N, Skali H, McMurray JJ, Swedberg K, Yusuf S, et al.; Candesartan in Heart Failure Reduction in Mortality (CHARM) Investigators. Influence of ejection fraction on cardiovascular outcomes in a broad spectrum of heart failure patients. *Circulation.* 2005 Dec 13;112(24):3738-44. doi: 10.1161/CIRCULATIONAHA.105.561423.
6. Curtis JP, Sokol SJ, Wang Y, Rathore SS, Ko DT, Jadbabaie F, et al. The association of left ventricular ejection fraction, mortality, and cause of death in stable outpatients with heart failure. *J Am Coll Cardiol.* 2003 Aug 20;42(4):736-42. doi: 10.1016/s0735-1097(03)00789-7.
7. Di Tullio MR, Qian M, Thompson JL, Labovitz AJ, Mann DL, Sacco RL, et al.; WARCEF Investigators. Left ventricular ejection fraction and risk of stroke and cardiac events in heart failure: Data from the Warfarin Versus Aspirin in Reduced Ejection Fraction Trial. *Stroke.* 2016 Aug;47(8):2031-7. doi: 10.1161/STROKEAHA.116.013679.
8. Rahmayani F, Paryono, Setyopranoto I. The role of ejection fraction to clinical outcome of acute ischemic stroke patients. *J Neurosci Rural Pract.* 2018 Apr-Jun;9(2):197-202. doi: 10.4103/jnpr.jnpr_490_17.
9. Wrigley P, Khoury J, Eckerle B, Alwell K, Moomaw CJ, Woo D, et al. Prevalence of positive troponin and echocardiogram findings and association with mortality in acute ischemic stroke. *Stroke.* 2017 May;48(5):1226-32. doi: 10.1161/STROKEAHA.116.014561.
10. Ziaeian B, Xu H, Matsouaka RA, Xian Y, Khan Y, Schwamm LS, et al. US surveillance of acute ischemic stroke patient characteristics, care quality, and outcomes for 2019. *Stroke.* 2022 Nov;53(11):3386-93. doi: 10.1161/STROKEAHA.122.039098.
11. Chee RCH, Lin NH, Ho JSY, Leow AST, Li TYW, Lee ECY, et al. Left ventricular ejection fraction association with acute ischemic stroke outcomes in patients undergoing thrombolysis. *J Cardiovasc Dev Dis.* 2023 May 25;10(6):231. doi: 10.3390/jcdd10060231.
12. Wei N, Wei Y, Nie X, Liu X, Xiang X, Pan Y, et al. Effect of left ventricular ejection fraction Spectrum on 1-Year mortality in patients with acute ischemic stroke or transient ischemic attack. *CNS Neurosci Ther.* 2023 Nov;29(11):3518-27. doi: 10.1111/cns.14285.
13. Milionis H, Faouzi M, Cordier M, D'Ambrogio-Remillard S, Eskandari A, Michel P. Characteristics and early and long-term outcome in patients with acute ischemic stroke and low ejection fraction. *Int J Cardiol.* 2013 Sep 30;168(2):1082-7. doi: 10.1016/j.ijcard.2012.11.036.
14. Xu Y, Zhao L, Zhang L, Han Y, Wang P, Yu S. Left atrial enlargement and the risk of stroke: a meta-analysis of prospective cohort studies. *Front Neurol.* 2020 Feb 14;11:26. doi: 10.3389/fneur.2020.00026.
15. Hamatani Y, Ogawa H, Takabayashi K, Yamashita Y, Takagi D, Esato M, et al. Left atrial enlargement is an independent predictor of stroke and systemic embolism in patients with non-valvular atrial fibrillation. *Sci Rep.* 2016 Aug 3;6:31042. doi: 10.1038/srep31042.
16. Bouzas-Mosquera A, Broullón FJ, Álvarez-García N, Méndez E, Peteiro J, Gándara-Sambade T, et al. Left atrial size and risk for all-cause mortality and ischemic stroke. *CMAJ.* 2011 Jul 12;183(10):E657-64. doi: 10.1503/cmaj.091688.

LIST OF ABBREVIATIONS

LVEF – Left Ventricular Ejection Fraction
AP – Anteroposterior Diameter of the Left Atrium
PLAX – Parasternal Long Axis View
EDD – End-Diastolic Diameter of the Left Ventricle
ESD – End-Systolic Diameter of the Left Ventricle
IVS – Interventricular Septum Thickness
PW – Posterior Wall Thickness of the Left Ventricle

Conflict of interest: None declared

PROCENA PSIOMETRIJSKIH KARAKTERISTIKA SRPSKE VERZIJE UPITNIKA ZA PROCENU METAKOGNITIVNE SVESNOSTI

ORIGINALNI RAD

ORIGINAL ARTICLE

ASSESSING PSYCHOMETRIC PROPERTIES OF THE SERBIAN VERSION OF THE METACOGNITIVE AWARENESS INVENTORY (MAI)

Zoran Bukumirić¹, Dejana Stanisavljević¹, Nataša Milić¹, Anđa Ćirković¹, Jelena Milin-Lazović¹, Marko Savić¹, Nina Rajović¹, Aleksandar Ćorac², Jelena Jović², Aleksandra Ilić², Mirjana Pajčin², Snežana Mugoša³, Mirjana Nedović Vuković³, Borko Bajić⁴, Igor Sladojević⁵, Srđan Mašić⁶, Dragan Spaić⁶, Dejan Bokonjić⁷

- ¹ Univerzitet u Beogradu, Medicinski fakultet, Institut za medicinsku statistiku i informatiku, Beograd, Srbija
- ² Univerzitet u Prištini, Kosovska Mitrovica, Medicinski fakultet, Katedra za preventivnu medicinu, Srbija
- ³ Univerzitet Crne Gore, Medicinski fakultet, Podgorica, Crna Gora
- ⁴ Institut za javno zdravlje Crne Gore, Podgorica, Crna Gora
- ⁵ Univerzitet u Banjoj Luci, Medicinski fakultet, Banja Luka, Bosna i Hercegovina
- ⁶ Univerzitet u Istočnom Sarajevu, Medicinski fakultet, Katedra za primarnu zdravstvenu zaštitu i javno zdravstvo, Foča, Bosna i Hercegovina
- ⁷ Univerzitet u Istočnom Sarajevu, Medicinski fakultet, Katedra za pedijatriju, Foča, Bosna i Hercegovina

- ¹ University of Belgrade, Faculty of Medicine, Institute for Medical Statistics and Informatics, Belgrade, Serbia
- ² University of Pristina, Kosovska Mitrovica, Medical Faculty, Department of Public Health, Serbia
- ³ University of Montenegro Faculty of Medicine, Podgorica, Montenegro
- ⁴ Institute of Public Health of Montenegro, Podgorica, Montenegro
- ⁵ University of Banja Luka, Faculty of Medicine, Banja Luka, Bosnia and Herzegovina
- ⁶ University of East Sarajevo, Faculty of Medicine, Department of Primary Health Care and Public Health, Foca, Bosnia and Herzegovina
- ⁷ University of East Sarajevo, Faculty of Medicine, Department for Pediatrics, Foca, Bosnia and Herzegovina

SAŽETAK

Uvod: Metakognicija, koja se odnosi na sposobnost praćenja i regulisanja sopstvenih kognitivnih procesa, igra ključnu ulogu u medicinskom obrazovanju. Procena metakognitivne svesnosti je posebno važna za studente, jer utiče na njihove strategije učenja i akademski uspeh. Studija je imala za cilj da ispita psihometrijske karakteristike srpske verzije Upitnika za procenu metakognitivne svesnosti (engl. *Metacognitive Awareness Inventory – MAI*), apostrofirajući njenu konstruktivnu validnost i internu konzistentnost.

Materijali i metode: Ova studija preseka sprovedena je na Medicinskom fakultetu Univerziteta u Beogradu, oktobra 2024. godine i obuhvatila je studente treće godine medicine. Psihometrijske karakteristike srpske verzije MAI upitnika procenjene su ocenom njene faktorske strukture i interne konzistentnosti. MAI upitnik se sastoji od 52 stavke, koje obuhvataju dve primarne komponente: „Znanje o kogniciji” i „Regulaciju kognicije”. Podkomponente komponente „Znanje o kogniciji” bile su: deklarativno znanje, proceduralno znanje i uslovno znanje, dok su podkomponente komponente „Regulacija kognicije” bile: planiranje, strategije upravljanja informacijama, praćenje učenja i razumevanja, strategije za ispravljanje grešaka i evaluacija.

Rezultati: U studiju je uključeno ukupno 426 studenata medicine. Prosečna starost ispitanika bila je 21.3 ± 1.4 godine, a većinu su činile osobe ženskog pola (68.5%). Prosečna ocena na skali bila je 199.0. Kao rezultat interne analize konzistentnosti srpske verzije MAI upitnika dobijen je Kronbahov koeficijent α od 0.94 i Mek Donaldov koeficijent ω od 0.95 za celu skalu, što ukazuje na odličnu pouzdanost skale. Srpska verzija MAI upitnika je validirana korišćenjem konfirmatorne faktorske analize, potvrđujući pretpostavljenu osmofaktorsku i dvofaktorsku strukturu. Osmofaktorski model pokazao je dobre indekse uklapanja ($IFI = 0.908$, $CFI = 0.905$, $RMSEA = 0.042$), sa statistički značajnim faktorskim opterećenjima ($p < 0.05$). Na isti način, dvofaktorski model je pokazao adekvatno uklapanje ($IFI = 0.921$, $CFI = 0.918$, $RMSEA = 0.039$), pri čemu su sva opterećenja takođe bila značajna ($p < 0.05$).

Zaključak: Naša studija je pokazala da je srpska verzija MAI upitnika pouzdan i validan instrument za procenu metakognitivne svesnosti studenata medicine.

Ključne reči: metakognicija, svesnost, psihometrijske karakteristike, interna konzistentnost, konstruktivna validnost

ABSTRACT

Introduction: Metacognition, which refers to the ability to oversee and regulate one's cognitive activities, plays a crucial role in medical education. Evaluating metacognitive awareness is particularly important for university students, as it impacts their learning strategies and academic performance. The objective of this study was to examine the psychometric characteristics of the Serbian adaptation of the Metacognitive Awareness Inventory (MAI), with an emphasis on its construct validity and internal consistency.

Materials and methods: This was a cross-sectional study conducted at the Faculty of Medicine University of Belgrade, on third-year medical students during October 2024. The psychometric properties of the Serbian version of the MAI were evaluated by assessing its factorial structure and internal consistency. The MAI consists of 52 items, comprising two primary components: 'Knowledge of Cognition' and 'Regulation of Cognition'. The subcomponent of "knowledge of cognition" were categorized into declarative knowledge, procedural knowledge, and conditional knowledge, whereas "regulation of cognition" subcomponent were classified into planning, information management strategies, comprehension monitoring, debugging, and evaluation.

Results: A total of 426 medical students were included in the study. The mean age of the respondents was 21.3 ± 1.4 years, and the majority were females (68.5%). The mean score of the scale was 199.0. The internal consistency analysis of the Serbian version of the MAI questionnaire yielded a Cronbach's α of 0.94, and a McDonald's ω of 0.95 for the entire scale, which indicates excellent scale reliability. The Serbian version of the MAI questionnaire was validated using confirmatory factor analysis, supporting both the hypothesized eight-factor and two-factor structures. The eight-factor model showed good fit indices ($IFI = 0.908$, $CFI = 0.905$, $RMSEA = 0.042$), with statistically significant factor loadings ($p < 0.05$). Similarly, the two-factor model demonstrated adequate fit ($IFI = 0.921$, $CFI = 0.918$, $RMSEA = 0.039$), with all loadings also significant ($p < 0.05$).

Conclusion: The present study revealed the Serbian version of MAI as reliable and valid tool for identifying medical students' metacognitive awareness.

Keywords: metacognition, awareness, psychometric properties, internal consistency, construct validity

Autor za korespondenciju:

Zoran Bukumirić

Institut za medicinsku statistiku i informatiku, Medicinski fakultet, Univerziteta u Beogradu

Dr Subotića 9, 11129 Beograd, Srbija

Elektronska adresa: zoran.bukumiric@med.bg.ac.rs

Corresponding author:

Zoran Bukumirić

Institute for Medical Statistics and Informatics, Faculty of Medicine, University of Belgrade

9 Dr Subotića Street, 11129 Belgrade, Serbia

E-mail: zoran.bukumiric@med.bg.ac.rs

Primljeno • Received: December 6, 2024; **Revidirano • Revised:** December 26, 2024; **Prihvaćeno • Accepted:** December 27, 2024; **Online first:** December 31, 2024

DOI: 10.5937/smclks-55246

UVOD

U poslednjih nekoliko decenija, metakognicija privlači značajnu pažnju u oblasti kognitivne psihologije, i nametnula se kao centralna tema naučnih istraživanja i naučne rasprave. U početku je koncept metakognicije bio uglavnom neistražen; međutim, skoriji napredak u kognitivnoj nauci je podcrtao njenu ključnu ulogu u različitim kognitivnim procesima [1]. Metakognicija se odnosi na sposobnost razumevanja, regulisanja i promišljanja o sopstvenim kognitivnim procesima [2]. Metakognicija se može definisati kao: „kognicija o kogniciji“ [3], „razmišljanje o razmišljanju“ [4] ili „znanje o saznanju“ [5]. Koncept metakognicije obuhvata dve glavne komponente: „Znanje o kogniciji“ i „Regulaciju kognicije“ [6].

Osobe koje pokazuju viši stepen metakognitivne svesnosti i veština se ističu u različitim kognitivnim zadacima, posebno onima koji zahtevaju efikasno planiranje, upravljanje informacijama, praćenje, ispravljanje grešaka i evaluaciju. Oni efikasnije upravljaju informacijama aktivnim odabirom, organizovanjem i davanjem prioriteta relevantnim podacima, što poboljšava njihove sposobnosti rešavanja problema [7].

Proces metakognicije igra ključnu ulogu u medicinskom obrazovanju, jer značajno poboljšava kritičko mišljenje, poboljšava tačnost kliničkog prosuđivanja, smanjuje dijagnostičke greške i neguje praksu promišljanja [8]. Štaviše, istraživanja pokazuju da učenici/studenti sa višom metakognitivnom svešću postižu vrhunske rezultate u nizu akademskih oblasti, uključujući učenje zasnovano na problemima, usvajanje jezika, saradnju, kolaborativno učenje i komunikaciju – veštine neophodne za medicinsko obrazovanje [9,10]. Shodno tome, procena metakognitivne svesnosti postaje od ključnog značaja za studente univerziteta, jer direktno utiče na njihovu sposobnost da efikasno upravljaju učenjem i postignu svoje akademske ciljeve [11].

Kao odgovor na ovakvu potrebu, Šro i Denison su uveli „Upitnik za procenu metakognitivne svesnosti“ (engl. *Metacognitive Awareness Inventory* – MAI) – jednostavan i efikasan alat za procenu metakognitivne svesnosti, koji nadmašuje tradicionalne metakognitivne ocene kao sredstvo za procenu metakognitivnih veština [2]. Međutim, uprkos sve većem prepoznavanju važnosti metakognitivnih veština u visokom obrazovanju, ne postoji standardizovan alat za konkretno merenje metakognitivne svesnosti studenata srpskih univerziteta. S obzirom na to da MAI još uvek nije validiran za srpsku populaciju, cilj ove studije je bio da se procene psihometrijska svojstva srpske verzije MAI upitnika, sa posebnim fokusom na njenu konstruktivnu validnost i internu konzistentnost.

INTRODUCTION

In recent decades, metacognition has garnered substantial attention within the field of cognitive psychology, emerging as a central topic of research and discussion. Initially, the concept of metacognition remained largely unexplored; however, recent advancements in cognitive science have underscored its crucial role in various cognitive processes [1]. Metacognition refers to the ability to reflect upon, understand, and regulate one's cognitive processes [2]. Metacognition can be defined as: 'cognition about cognition' [3], 'thinking about thinking' [4], or 'knowing about knowing' [5]. The concept of metacognition includes two main components: 'Knowledge of Cognition' and 'Regulation of Cognition' [6].

Individuals demonstrating higher metacognitive awareness and skills excel in various cognitive tasks, especially those necessitating effective planning, information management, monitoring, debugging, and evaluation. They manage information more efficiently by actively selecting, organizing, and prioritizing relevant data, which enhances their problem-solving capabilities [7].

The metacognitive process plays a pivotal role in medical education, as it significantly enhances critical thinking, improves the accuracy of clinical judgment, reduces diagnostic errors, and fosters reflective practices [8]. Furthermore, research indicates that students with higher metacognitive awareness achieve superior outcomes across a range of academic domains, including problem-based learning, language acquisition, collaboration, collaborative learning, and communication – skills essential for medical training [9,10]. Consequently, assessing metacognitive awareness becomes a critical concern for university students, as it directly influences their ability to manage learning effectively and achieve their academic goals [11].

To address this, Schraw and Dennison introduced the *Metacognitive Awareness Inventory* (MAI) – a simple and efficient tool for evaluating metacognitive awareness, moving beyond traditional metacognitive judgments as a means of assessing metacognitive skills [2]. However, despite the growing recognition of the importance of metacognitive skills in higher education, no standardized tool exists to specifically measure the metacognitive awareness of Serbian university students. Given that the MAI has not yet been validated for the Serbian population, the objective of this study was to evaluate the psychometric properties of the Serbian version of the MAI, with particular focus on its construct validity and its internal consistency.

MATERIJALI I METODE

Dizajn studije

Ova studija preseka sprovedena je na Institutu za medicinsku statistiku i informatiku Medicinskog fakulteta Univerziteta u Beogradu, u oktobru 2024. godine. Učešće u studiji bilo je dobrovoljno, a poverljivost podataka svih ispitanika bila je osigurana. Etičko odobrenje (br. 25/IX-3) dobijeno je od Etičke komisije Medicinskog fakulteta Univerziteta u Beogradu. Studija je sprovedena u okviru ERASMUS+ projekta: „Razvoj i implementacija metakognitivnih problemski baziranih modula u kursevima mešovite nastave u medicinskim naukama“ (engl. *Development and Implementation of Metacognitive Problem-based Modules in Blended Learning Courses in Medical Sciences – ProBLEMS*).

Učesnici studije

Populaciju u ovoj studiji činili su studenti treće godine medicine upisani na Medicinski fakultet Univerziteta u Beogradu. Veličina uzorka za analizu psihometrijskih svojstava upitnika za procenu metakognitivne svesnosti određena je primenom pravila **N:q** (N: broj ispitanika; q: broj stavki u upitniku). Za definisane vrednosti $q = 52$ i vrednost 5 za odnos N:q, planirano je da u istraživanje bude uključeno najmanje 260 ispitanika.

Instrument

Upitnik za procenu metakognitivne svesnosti (MAI) je instrument za samoprocenu koju čine 52 stavke, a koja obuhvata dve primarne dimenzije: „Znanje o kogniciji“ (17 stavki) i „Regulaciju kognicije“ (35 stavki) [2]. Podkomponente u okviru komponente „Znanje o kogniciji“ kategorisane su na sledeći način: deklarativno znanje (engl. *declarative knowledge* (DK) – samosvest i strategije; 8 stavki), proceduralno znanje (engl. *procedural knowledge* (PK) – primena procedura; 4 stavke) i uslovno znanje (engl. *conditional knowledge* (CK) – znanje o tome kada i kako primeniti strategije). Podkomponente u okviru komponente „Regulacija kognicije“ klasifikovane su kao: planiranje (engl. *planning* (P) – postavljanje ciljeva; 7 stavki), strategije upravljanja informacijama (engl. *information management strategies* (IMS) – strategije implementacije; 10 stavki), praćenje učenja i razumevanja (engl. *comprehension monitoring* (CM) – samopraćenje, 7 stavki), strategije ispravljanja grešaka (engl. *debugging strategies* (DS) – ispravljanje grešaka; 5 stavki) i evaluacija (engl. *evaluation* (E) – evaluacija učinka; 6 stavki). Instrument koristi petostepenu Likertovu skalu, sa vrednostima koje se kreću od 1 (uvek netačno) do 5 (uvek tačno). Ukupan skor se kreće od 52 do 260, pri čemu viši rezultati ukazuju na veću svesnost o kogniciji i njenoj regulaciji [2]. Pre početka

MATERIALS AND METHODS

Study design

This cross-sectional study was conducted at the Institute for Medical Statistics and Informatics of the University of Belgrade Faculty of Medicine in October 2024. Participation in the study was voluntary, and the confidentiality of all respondents was observed. Ethical approval (No: 25/IX-3) was obtained from the University of Belgrade Faculty of Medicine Ethics Committee. The study was conducted within the ERASMUS+ project: Development and Implementation of Metacognitive Problem-based Modules in Blended Learning Courses in Medical Sciences (ProBLEMS).

Study participants

The study population comprised third-year medical students enrolled at the University of Belgrade Faculty of Medicine. The sample size for analyzing the psychometric properties of the metacognitive awareness assessment questionnaire was determined using the **N:q rule** (N: number of respondents; q: number of questionnaire items). For the defined value of $q = 52$ and the value of 5 for the N:q ratio, a minimum of 260 respondents were planned to be included in the research.

Instrument

The Metacognitive Awareness Inventory (MAI) is a 52-item self-report tool comprising two primary dimensions: 'Knowledge of Cognition' (17 items) and 'Regulation of Cognition' (35 items) [2]. The subcomponents of 'Knowledge of Cognition' were categorized as follows: declarative knowledge (DK – self-awareness and strategies; 8 items), procedural knowledge (PK – application of procedures; 4 items), and conditional knowledge (CK – knowledge of when and how to apply strategies; 5 items). The subcomponents of 'Regulation of Cognition' were classified as: planning (P – goal-setting; 7 items), information management strategies (IMS – implementation strategies; 10 items), comprehension monitoring (CM – self-monitoring, 7 items), debugging strategies (DS – error correction; 5 items), and evaluation (E – performance evaluation; 6 items). The instrument employs a five-point Likert scale, with values spanning from 1 (always false) to 5 (always true). The total score ranges from 52 to 260, with higher scores indicating higher awareness of cognition and its regulation [2]. Before the beginning of the study, we obtained formal approval from the author of the questionnaire, who authorized the validation and use of the instrument. A comprehensive structural description of the MAI questionnaire is available in Table 1.

Tabela 1. A comprehensive structural description of the MAI questionnaire

Komponente / Components	Podkomponente / Subcomponents	Stavke / Items	Broj stavki / Number of Items
Znanje o kogniciji / Knowledge of cognition	Deklarativno znanje / Declarative knowledge	5, 10, 12, 16, 17, 20, 32, 46	8
	Proceduralno znanje / Procedural knowledge	3, 14, 27, 33	4
	Uslovno znanje / Conditional knowledge	15, 18, 26, 29, 35	5
Regulacija kognicije / Regulation of cognition	Planiranje / Planning	4, 6, 8, 22, 23, 42, 45	7
	Strategije upravljanja informacijama / Information management strategies	9, 13, 30, 31, 37, 39, 41, 43, 47, 48	10
	Praćenje učenja i razumevanja / Comprehension monitoring	1, 2, 11, 21, 28, 34, 49	7
	Strategije za ispravljanje grešaka / Debugging strategies	25, 40, 44, 51, 52	5
	Evaluacija / Evaluation	7, 19, 24, 36, 38, 50	6

Table 1. A comprehensive structural description of the MAI questionnaire

istraživanja, dobili smo formalno odobrenje od autora upitnika, koji je odobrio validaciju i upotrebu instrumenta. Sveobuhvatni strukturalni opis MAI upitnika dostupan je u Tabeli 1.

Prevođenje i kulturološka adaptacija

Prevođenje i kulturološka adaptacija MAI upitnika obavljani su prema dobro utvrđenim, međunarodno priznatim smernicama, koje obuhvataju nekoliko faza, kako bi se obezbedila validnost i pouzdanost prevedenog instrumenta [12]. Prva faza je podrazumevala početni prevod upitnika sa originalne engleske verzije na verziju na srpskom jeziku. Nakon toga je usledio proces usklađivanja tokom kojeg je prevedena verzija pregledana i dorađena kako bi se obezbedila jasnoća i prikladnost jezika za stanovništvo koje govori srpskim jezikom. Nakon toga, srpska verzija je ponovo prevedena na engleski jezik kako bi se proverila konzistentnost i usklađenost sa originalnim sadržajem, a sprovedena je još jedna runda usaglašavanja kako bi se otklonila sva odstupanja. Da bi se osigurala kulturološka i konceptualna relevantnost konačne verzije ovog instrumenta, grupa stručnjaka, uključujući lingviste i stručnjake za predmetnu materiju, uključila se u detaljnu diskusiju o prevodima. Njihov kolektivni doprinos doveo je do pripreme konačne verzije upitnika, koji je smatran pogodnim za upotrebu u kontekstu istraživanja. Procena psihometrijskih svojstava MAI upitnika na srpskom jeziku zasnivala se na proceni: prihvatljivosti upitnika, primeni faktorske analize i analizi pouzdanosti skale.

Upitnik je distribuiran preko Mudl platforme u okviru predmeta Medicinska statistika i informatika. Pre uključivanja u istraživanje, studenti su bili detaljno informisani o ciljevima i opsegu studije, čime je obezbeđeno da oni razumeju kontekst i značaj istraživanja. U skladu sa etičkom naučnom praksom, od učesnika je zatraženo da daju informisani pristanak, potvrđujući da dobrovolj-

Translation and cultural adaptation

The translation and cultural adaptation of the MAI questionnaire were carried out according to well-established, internationally recognized guidelines, which encompass several stages, so as to ensure the validity and reliability of the translated instrument [12]. The first stage involved the initial translation of the questionnaire from its original English version into the version in Serbian. This was followed by a harmonization process wherein the translated version was reviewed and refined to ensure clarity and appropriateness of the language for the Serbian-speaking population. Subsequently, the Serbian version was translated back into English to check for consistency and alignment with the original content, and another round of harmonization was conducted to address any discrepancies. To ensure the cultural and conceptual relevance of the final version of this instrument, a group of experts, including linguists and subject-matter specialists, engaged in a detailed discussion of the translations. Their collective input led to the preparation of the final version of the questionnaire, which was deemed suitable for use in the research context. The evaluation of the psychometric properties of the MAI questionnaire in the Serbian language was based on the evaluation of the following: the acceptability of the questionnaire, the application of factor analysis, and the analysis of the reliability of the scale.

The questionnaire was administered through the Moodle platform as part of the Medical Statistics and Informatics course. Prior to participation, students were thoroughly informed about the objectives and scope of the study, ensuring that they understood the context and significance of the research. Following ethical research practices, participants were asked to provide informed consent, confirming their voluntary participation in the study and their understanding of

no učestvuju u studiji i da razumeju svoja prava, uključujući tu i pravo na poverljivost kao i mogućnost da se bez posledica povuku iz istraživanja u bilo kojoj njegovoj fazi. Kada je dobijen informisani pristanak, studenti su nastavili da popunjavaju upitnik, koji je osmišljen tako da prikupi podatke relevantne za ciljeve istraživanja.

Statistička analiza

Kategorijalne varijable su sumirane korišćenjem učestalosti i procenata, dok su kontinuirane varijable opisane korišćenjem aritmetičke sredine i vrednosti standardne devijacije (SD), za podatke koji slede normalnu distribuciju, ili kao medijana, sa minimalnim i maksimalnim vrednostima za podatke koji nisu normalno raspoređeni. Psihometrijska evaluacija srpske verzije MAI upitnika uključila je procene validnosti i pouzdanosti. Konfirmatorna faktorska analiza (engl. *confirmatory factor analysis* - CFA) sprovedena je da bi se verifikovala izvorna osmofaktorska struktura MAI upitnika. Uklapanje modela je procenjeno korišćenjem hi-kvadrat testa (uz $p > 0,05$ što ukazuje na dobro uklapanje) kao i sa tri dodatna indeksa: komparativnim indeksom uklapanja (engl. *comparative fit index* - CFI), inkrementnim indeksom uklapanja (engl. *incremental fit index* - IFI) i korenom prosečne kvadrirane greške aproksimacije (engl. *root mean square error of approximation* - RMSEA). Adekvatan model odgovara vrednostima CFI i IFI koje su iznad 0,9 i RMSEA vrednostima ispod 0,06. Pouzdanost je analizirana izračunavanjem interne konzistentnosti korišćenjem Kronbahovog koeficijenta α i Mek Donaldovog koeficijenta ω (vrednosti bliže 1 označavaju veću pouzdanost). Urađeni su dvostrani statistički testovi, sa značajnošću postavljenom na $p < 0,05$. Analize su obavljene korišćenjem softvera Amos 21, IBM SPSS Statistics 24 (IBM Corporation, Armonk, NY, USA) i R softvera (Verzija 4.3.3, R Foundation for Statistical Computing, Vienna, Austria).

REZULTATI

U istraživanju je učestvovalo ukupno 426 studenata medicine, koji su dali potpune odgovore na upitnik. Prosečna starost ispitanika je bila $21,3 \pm 1,4$ godine, a većinu su činile osobe ženskog pola (68,5%).

U Tabeli 2. su prikazane prosečne vrednosti rezultata i statistika pouzdanosti za svaku stavku, kao i ukupno merenje metakognitivne svesnosti među studentima medicine. Prosečna ocena na skali bila je 199,0. Srednji rezultati potkategorija bili su sledeći: 30,3 za deklarativno, 15,2 za proceduralno i 19,0 za uslovno znanje; 26,2 za podskalu planiranja, 39,5 za strategije upravljanja informacijama, 26,5 za praćenje učenja i razumevanja, 20,5 za strategije za ispravljanje grešaka i 21,9 za podskalu evaluacije. Srpska verzija MAI upitnika pokazala je odličnu pouzdanost, sa Kronbahovim koeficijentom α

their rights, including confidentiality and the option to withdraw at any stage without consequence. Once informed consent was obtained, students proceeded to complete the questionnaire, which was designed to collect data relevant to the research objectives.

Statistical analysis

Categorical variables were summarized using frequencies and percentages, while continuous variables were described using mean values and values of standard deviation (SD), for data following a normal distribution, or as median values, with minimum and maximum values for data not normally distributed. The psychometric evaluation of the Serbian version of the MAI included assessments of validity and reliability. Confirmatory factor analysis (CFA) was conducted to verify the original eight-factor structure of the MAI. The model fit was assessed using the chi-square test (with $p > 0.05$ suggesting a good fit) along with three additional indices: the comparative fit index (CFI), the incremental fit index (IFI), and the root mean square error of approximation (RMSEA). An adequate model fit was determined by CFI and IFI values exceeding 0.9 and RMSEA values below 0.06. Reliability was analyzed by calculating internal consistency using Cronbach's α and McDonald's ω coefficients (values closer to 1 denote higher reliability). Two-tailed statistical tests were performed, with significance set at $p < 0.05$. Analyses were carried out using the Amos 21, IBM SPSS Statistics 24 software (IBM Corporation, Armonk, NY, USA), and the R software (Version 4.3.3, R Foundation for Statistical Computing, Vienna, Austria).

RESULTS

A total of 426 medical students, who provided complete responses to the questionnaire, were included in the study. The mean age of the respondents was 21.3 ± 1.4 years, and the majority were females (68.5%).

Table 2. presents the average scores and reliability statistics for each item, as well as the overall measurement of metacognitive awareness among medical students. The mean score on the scale was 199.0. The mean scores of the subcategories were as follows: 30.3 for declarative, 15.2 for procedural, and 19.0 for conditional knowledge; 26.2 for the planning subscale, 39.5 for information management strategies, 26.5 for comprehension monitoring, 20.5 for debugging strategies, and 21.9 for the evaluation subscale. The Serbian version of the MAI questionnaire demonstrated excellent reliability, with Cronbach's α of 0.94 for the total scale. Subscale reliability ranged from 0.57 for comprehension monitoring to 0.81 for information management strategies. Similarly, McDonald's ω for the overall scale

Tabela 2. Average scores and reliability statistics

Podkomponente / Subcomponents	mean (sd)	median (range)	Cronbach α	McDonald's ω
Deklarativno znanje (DK) / Declarative knowledge (DK)	30.3 (4.6)	31 (20-40)	0.77	0.82
Proceduralno znanje (PK) / Procedural knowledge (PK)	15.2 (2.6)	15 (7-20)	0.66	0.69
Uslovno znanje (CK) / Conditional knowledge (CK)	19.0 (3.1)	19 (11-25)	0.63	0.69
Planiranje (P) / Planning (P)	26.2 (4.3)	26 (14-35)	0.70	0.81
Strategije upravljanja informacijama (IMS) / Information management strategies (IMS)	39.5 (5.6)	40 (25-50)	0.81	0.86
Praćenje učenja i razumevanja (CM) / Comprehension monitoring (CM)	26.5 (3.5)	27 (17-34)	0.57	0.67
Strategije za ispravljanje grešaka (DS) / Debugging strategies (DS)	20.5 (3.3)	21 (9-25)	0.76	0.83
Evaluacija (E) / Evaluation (E)	21.9 (3.5)	22 (10-30)	0.59	0.70
Komponente / Components				
Znanje o kogniciji / Knowledge of cognition	64.5 (9.1)	64 (43-83)	0.87	0.89
Regulacija kognicije / Regulation of cognition	134.5 (16.6)	136 (101-171)	0.91	0.92
Ukupno / Total score	199.0 (24,7)	200 (151-252)	0.94	0.95

od 0,94 za ukupnu skalu. Pouzdanost subskale se kretala od 0,57 za praćenje učenja i razumevanja do 0,81 za strategije upravljanja informacijama. Slično tome, Mek Donaldov koeficijent ω za ukupnu skalu je bio 0,95, što potvrđuje visoku pouzdanost, sa vrednostima podskale u rasponu između 0,67 (praćenje učenja i razumevanja) i 0,86 (strategije upravljanja informacijama) (Tabela 2).

Srpska verzija MAI upitnika je procenjena primenom konfirmatorne faktorske analize i za osmofaktorski i za dvofaktorski model. Nalazi su podržali dobro uklapanje za pretpostavljenu strukturu od osam faktora. Iako je hi-kvadrat test pokazao nedostatak uklapanja za osmofaktorski model ($\chi^2 = 1.851,5$; $p < 0,001$; $\chi^2/df = 1,73$), ovo je bilo očekivano zbog veličine uzorka. Indeksi uklapanja, uključujući IFI (0,908) i CFI (0,905), bili su iznad preporučenog praga od 0,90, dok je RMSEA vrednost (0,042; 90% CI: 0,038–0,045) bila u prihvatljivom opsegu od $\leq 0,06$. Sva standardizovana faktorska opterećenja su bila značajna ($p < 0,05$), (Grafikon 1). I dvofaktorski model je pokazao slične rezultate. Hi-kvadrat test je ponovo ukazao na loše uklapanje ($\chi^2 = 1.742,4$; $p < 0,001$; $\chi^2/df = 1,64$), što je pripisano veličini uzorka, dok su vrednosti IFI (0,921) i CFI (0,918) premašile 0,90, a RMSEA vrednost (0,039; 90% CI: 0,035–0,042) je ispunila preporučeni standard. Sva faktorska opterećenja u ovom modelu su takođe bila statistički značajna ($p < 0,05$), (Grafikon 2).

DISKUSIJA

Srpska verzija MAI upitnika validirana je na uzorku studenata osnovnih studija medicine. Nalazi su pokazali da instrument poseduje adekvatnu validnost i pouzdanost. Ovi rezultati ukazuju da je srpska verzija MAI upitnika pouzdan i efikasan instrument za procenu metakognitivne svesnosti u ovoj populaciji.

Table 2. Average scores and reliability statistics

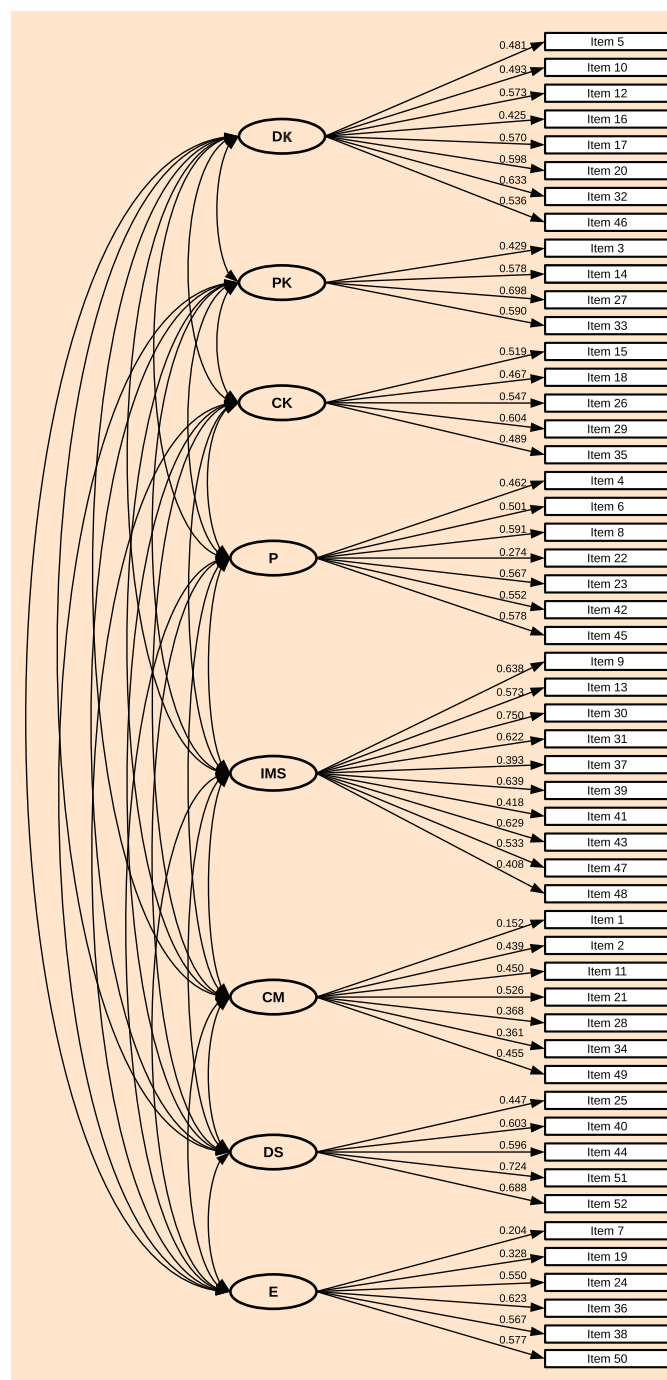
Podkomponente / Subcomponents	mean (sd)	median (range)	Cronbach α	McDonald's ω
Deklarativno znanje (DK) / Declarative knowledge (DK)	30.3 (4.6)	31 (20-40)	0.77	0.82
Proceduralno znanje (PK) / Procedural knowledge (PK)	15.2 (2.6)	15 (7-20)	0.66	0.69
Uslovno znanje (CK) / Conditional knowledge (CK)	19.0 (3.1)	19 (11-25)	0.63	0.69
Planiranje (P) / Planning (P)	26.2 (4.3)	26 (14-35)	0.70	0.81
Strategije upravljanja informacijama (IMS) / Information management strategies (IMS)	39.5 (5.6)	40 (25-50)	0.81	0.86
Praćenje učenja i razumevanja (CM) / Comprehension monitoring (CM)	26.5 (3.5)	27 (17-34)	0.57	0.67
Strategije za ispravljanje grešaka (DS) / Debugging strategies (DS)	20.5 (3.3)	21 (9-25)	0.76	0.83
Evaluacija (E) / Evaluation (E)	21.9 (3.5)	22 (10-30)	0.59	0.70
Komponente / Components				
Znanje o kogniciji / Knowledge of cognition	64.5 (9.1)	64 (43-83)	0.87	0.89
Regulacija kognicije / Regulation of cognition	134.5 (16.6)	136 (101-171)	0.91	0.92
Ukupno / Total score	199.0 (24,7)	200 (151-252)	0.94	0.95

was 0.95, confirming high reliability, with subscale values ranging between 0.67 (comprehension monitoring) and 0.86 (information management strategies) (Table 2).

The Serbian version of the MAI questionnaire was evaluated using maximum likelihood confirmatory factor analysis for both the eight-factor and two-factor models. The findings supported a good fit for the hypothesized eight-factor structure. Although the chi-square test indicated a lack of fit for the eight-factor model ($\chi^2 = 1,851.5$; $p < 0.001$; $\chi^2/df = 1.73$), this was anticipated due to the large sample size. Fit indices, including IFI (0.908) and CFI (0.905), were above the recommended threshold of 0.90, while the RMSEA value (0.042; 90% CI: 0.038–0.045) was within the acceptable range of ≤ 0.06 . All standardized factor loadings were significant ($p < 0.05$), (Figure 1). Similarly, the two-factor model showed comparable results. The chi-square test again suggested a poor fit ($\chi^2 = 1,742.4$; $p < 0.001$; $\chi^2/df = 1.64$), which was attributed to the sample size, while the IFI (0.921) and CFI (0.918) values exceeded 0.90, and the RMSEA value (0.039; 90% CI: 0.035–0.042) met the recommended standard. All factor loadings in this model were also statistically significant ($p < 0.05$), (Figure 2).

DISCUSSION

The Serbian adaptation of the MAI questionnaire was validated in a sample of undergraduate medical students. The findings demonstrated that the instrument possesses adequate validity and reliability. These results indicate that the Serbian version of the MAI is a reliable and effective tool for assessing metacognitive awareness in this population.

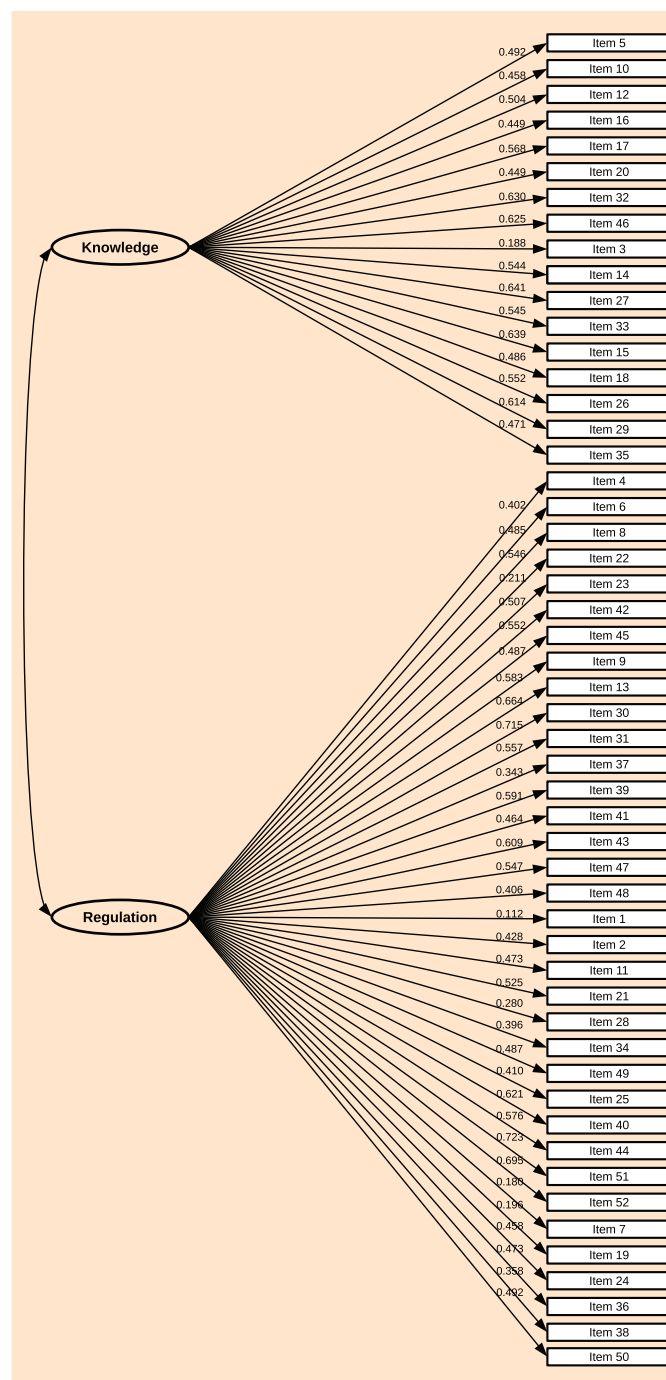


Grafikon 1. Standardizovana faktorska opterećenja za MAI upitnik na srpskom jeziku za osmofaktorski model

Legenda: DK – deklarativno znanje (engl. *declarative knowledge*); PK – proceduralno znanje (engl. *procedural knowledge*); CK – uslovno znanje (engl. *conditional knowledge*); P – planiranje (engl. *planning*); IMS – strategije upravljanja informacijama (engl. *information management strategies*); CM – praćenje učenja i razumevanja (engl. *comprehension monitoring*); DS – strategije ispravljanja grešaka (engl. *debugging strategies*); E – evaluacija (engl. *evaluation*)

Figure 1. Standardized factor loadings for the MAI questionnaire in the Serbian language for the eight-factor model

Legend: DK – declarative knowledge; PK – procedural knowledge; CK – conditional knowledge; P – planning; IMS – information management strategies; CM – comprehension monitoring; DS – debugging strategies; E – evaluation



Grafikon 2. Standardizovana faktorska opterećenja za MAI upitnik na srpskom jeziku za dvofaktorski model

Legenda: Knowledge – Znanje; Regulation – Regulacija

Figure 2. Standardized factor loadings for the MAI questionnaire in the Serbian language for the two-factor model

Međunarodna grupa za metakogniciju (engl. *International Group on Metacognition*) je sprovela studiju validacije MAI upitnika primenom standardizovane španske verzije. Ova studija je uključivala 1.622 studenta osnovnih studija iz 12 zemalja španskog govornog područja. Studija je imala za cilj da proceni pouzdanost i međukulturalnu primenljivost instrumenta. Nalazi su podržali robustan model konfirmatorne faktorske analize osnovnog nivoa, konzistentan u svim zemljama učesnicama, potvrđujući prvobitnu dvofaktorsku strukturu identifikovanu u uzorcima sa govornicima engleskog jezika iz Sjedinjenih Američkih Država. Sprovedene su analize grupne invarijantnosti merenja da bi se procenila ekvivalentnost MAI upitnika u različitim kulturološkim kontekstima. Iako su uočene manje varijacije u pet parametara među nekim zemljama, hi-kvadrat testovi razlike su pokazali da dopuštanje ovim parametrima da variraju nije značajno poboljšalo uklapanje modela, u poređenju sa modelom koji je potpuno ograničen. Ovo je potvrdilo mernu invarijantnost MAI upitnika među populacijama koje govore španski, što ukazuje da se instrument može pouzdano koristiti u različitim kulturnim okruženjima bez značajne pristrasnosti ili promena u njegovim svojstvima [13].

U poređenju sa studijom Omprakaša i saradnika [14], koja je ispitivala metakognitivnu svesnost među studentima prve godine medicine i stomatologije u Indiji i koja je identifikovala strukturu od šest faktora nakon uklanjanja 12 stavki sa malim opterećenjem, naša analiza srpske verzije MAI upitnika u kojoj je primenjena procena maksimalne verodostojnosti otkrila je osmofaktorsku strukturu. Dok su Omprakaš i saradnici, primenom eksploratorne faktorske analize (EFA), potvrdili prihvatljiv, iako ne idealan model, sa nešto nižim indeksima uklapanja ($CFI = 0,78$; $GFI = 0,80$; $AGFI = 0,77$), naši nalazi su pokazali da, iako je hi-kvadrat test odbacio osmofaktorski model ($\chi^2 = 1.851,5$; $\chi^2/df = 1,73$; $p < 0,001$), što je bilo očekivano zbog veličine uzorka, ostali indeksi uklapanja su bili zadovoljavajući. Konkretno, IFI (0,908) i CFI (0,905) su bili iznad preporučene granične vrednosti od $\geq 0,90$, a vrednost $RMSEA$ od 0,042 (0,038–0,045) je bila ispod predložene granične vrednosti od $\leq 0,06$. Ovi rezultati ukazuju da, u poređenju sa prethodnom studijom, naša srpska verzija MAI upitnika pokazuje bolje karakteristike uklapanja i stabilniju multidimenzionalnu strukturu, čime je podržana hipoteza da metakognitivna svesnost može biti organizovana na složeniji način u okviru ovog uzorka.

Sistematski pregled studija u kojima je korišćen MAI upitnik otkriva širok spektar nalaza u vezi sa faktorskim strukturama, u rasponu od jednodimenzionalnih struktura do onih sastavljenih od osam komponenti. Rezultati potvrđuju da su izveštaji samoprocene naj-

The International Group on Metacognition conducted a validation study of the MAI with a standardized Spanish version, involving 1,622 undergraduate students from 12 Spanish-speaking countries. The study sought to evaluate the reliability and cross-cultural applicability of the instrument. Findings supported a robust baseline confirmatory factor analysis model, consistent across all participating countries, reinforcing the original two-factor structure identified in English-speaking samples from the United States. Multigroup measurement invariance analyses were carried out to assess the equivalence of the MAI across diverse cultural contexts. Although minor variations were observed in five parameters among some countries, chi-square difference tests showed that allowing these parameters to vary did not significantly improve the model fit, as compared to a fully constrained model. This confirmed the measurement invariance of the MAI across Spanish-speaking populations, indicating that the instrument can be reliably used in different cultural settings without significant bias or alterations in its properties [13].

In comparison with the study by Omprakash et al. [14], which examined metacognitive awareness among first-year medical and dental students in India and identified a six-factor structure after removing 12 low-loading items, our analysis of the Serbian version of the MAI questionnaire using maximum likelihood estimation revealed an eight-factor structure. While Omprakash et al. confirmed an acceptable, though not ideal model, using exploratory factor analysis (EFA), with somewhat lower fit indices ($CFI = 0.78$; $GFI = 0.80$; $AGFI = 0.77$), our findings showed that, although the chi-square test rejected the eight-factor model ($\chi^2 = 1,851.5$; $p < 0.001$; $\chi^2/df = 1.73$), as anticipated due to the large sample size, other fit indices were satisfactory. Specifically, the IFI (0.908) and CFI (0.905) exceeded the recommended cutoff value of ≥ 0.90 , and the $RMSEA$ amounting to 0.042 (0.038–0.045) fell below the suggested threshold of ≤ 0.06 . These results indicate that, compared to the previous study, our Serbian version of the MAI exhibits better fit characteristics and a more stable multidimensional structure, thereby supporting the hypothesis that metacognitive awareness may be organized in a more complex manner within this particular sample.

A systematic review of studies utilizing the MAI questionnaire reveals a wide range of findings regarding factor structures, ranging from unidimensional structures to those with eight components. The results confirm that self-reports are most suitable for measuring two primary factors of metacognition – knowledge and regulation [15]. Schraw and Denison's original study indicates stronger evidence supporting

pogodniji za merenje dva primarna faktora metakognicije – znanja i regulacije [15]. Šroova i Denisonova originalna studija ukazuje na uverljivije dokaze koji podržavaju dvofaktorsku strukturu (znanje o kogniciji i regulisanje kognicije) u odnosu na strukturu sačinjenu od osam podkomponenti [2].

Li i saradnici su nedavno sprovedi studiju koja je uključivala 592 studenta sestrinstva sa četiri univerziteta iz različitih regiona u Kini [12]. Njihovi nalazi su pokazali da je Kineska verzija Skale metakognitivne svesnosti (engl. *Chinese version of the Metacognitive Awareness Scale – C-MAS*) od 52 stavke validan i pouzdan instrument. Skala je pokazala snažnu validnost sadržaja, prihvatljivu internu konzistentnost i jaku konstruktivnu validnost, potvrđujući njenu korisnost u proceni metakognitivne svesnosti među kineskim studentima sestrinstva. Kako se navodi u studiji, 52 stavke C-MAS skale su bile organizovane u osam faktora, formirajući model prvog reda. Ovaj model je pokazao odličnu internu konzistentnost, sa Kronbahovim koeficijentom α od 0,963 i faktorskim opterećenjem u rasponu od 0,875 do 0,992. Osam faktora je dalje grupisano u dve šire dimenzije, što je kao rezultat dalo model drugog reda. Za ovaj model su prijavljeni Kronbahov α od 0,800 i faktor opterećenja između 0,756 i 0,788, što ukazuje na dobru pouzdanost. Utvrđeno je da su i model prvog i drugog reda C-MAS skale robusni, te da pružaju pouzdane instrumente za procenu metakognitivne svesnosti.

Na sličan način, u našoj studiji, srpska verzija MAI upitnika je pokazala odličnu pouzdanost, sa Kronbahovim koeficijentom α od 0,94. Pouzdanost podskale se kretala od 0,57 (praćenje učenja i razumevanja) do 0,81 (upravljanje informacijama), što dodatno potvrđuje visoku internu konzistentnost skale. Visoka interna konzistentnost ukupnog rezultata potvrđuje da stavke mere jedinstveni konstrukt. Slični nalazi su zabeleženi i u drugim studijama [2,15]. Niže vrednosti interne konzistentnosti procenjene primenom Kronbahovog koeficijenta α za pojedinačne faktore mogu se pripisati lingvističkim i kulturološkim razlikama između originalne i prevedene verzije upitnika, što je uobičajeno kada se instrumenti prilagođavaju novim populacijama. Pored toga, broj stavki unutar faktora varirao je između 4 i 10. Dobro je poznato da manji broj stavki ima tendenciju da proizvede niže vrednosti interne konzistentnosti, što jeste ograničenje primenjene metrike. Alternativna metrika, Mek Donaldov koeficijent ω , koja je robusnija u proceni interne konzistentnosti, pokazala je zadovoljavajuće vrednosti [17-19].

Međukulturalno prevođenje i psihometrijska procena upitnika igraju ključnu ulogu u unapređivanju naučnog poznavanja metakognitivne svesnosti. Ovaj proces ne samo da poboljšava tačnost i validnost ala-

the two-factor structure (knowledge of cognition and regulation of cognition) than the structure with eight subcomponents [2].

Li et al. recently conducted a study involving 592 nursing students from four universities in different regions of China [16]. Their findings demonstrated that the 52-item Chinese version of the Metacognitive Awareness Scale (C-MAS) is a valid and reliable instrument. The scale showed strong content validity, acceptable internal consistency, and solid construct validity, confirming its utility for assessing metacognitive awareness among Chinese nursing students. According to the study, the 52 items of the C-MAS were organized into eight factors, forming a first-order model. This model exhibited excellent internal consistency, with a Cronbach's α of 0.963 and factor loadings ranging from 0.875 to 0.992. The eight factors were further grouped into two broader dimensions, resulting in a second-order model. For this model, a Cronbach's α of 0.800 and factor loadings between 0.756 and 0.788 were reported, indicating good reliability. Both the first-order and second-order models of the C-MAS were found to be robust, providing reliable tools for evaluating metacognitive awareness.

Similarly, in our study, the Serbian version of the MAI demonstrated excellent reliability, with a Cronbach's α of 0.94. Subscale reliability ranged from 0.57 (comprehension monitoring) to 0.81 (information management), thus further confirming the scale's strong internal consistency. The high internal consistency of the total score confirms that the items measure a unified construct. Similar findings have been reported in other studies [2,15]. Lower values of internal consistency estimated using Cronbach's α for individual factors may be attributed to linguistic and cultural differences between the original and translated versions of the questionnaire, which is common when adapting instruments for new populations. Additionally, the number of items within the factors varied between 4 and 10. It is well-known that a smaller number of items tends to produce lower internal consistency values, which is a limitation of the applied metric. An alternative metric, McDonald's ω , which is more robust in estimating internal consistency, demonstrated satisfactory values [17-19].

Cross-cultural translation and psychometric assessment of a questionnaire play a crucial role in advancing scientific understanding of metacognitive awareness. Not only does this process improve the accuracy and validity of assessment tools but it also provides a foundation for exploring metacognitive awareness in various fields and professions. The results of our study align with the findings of Li et al. [15], which emphasize

ta za procenu, već takođe pruža osnovu za istraživanje metakognitivne svesnosti u različitim oblastima i profesijama. Rezultati naše studije su u skladu sa nalazima Li i saradnika [15], koji naglašavaju važnost eksplicitnog definisanja i kvantifikacije kognitivnog znanja i kognitivne regulacije. Ovo je od suštinskog značaja za razvoj delotvornih obrazovnih strategija i planova delovanja.

Buduće studije mogu primeniti srpsku verziju MAI upitnika za procenu metakognitivne svesnosti studenata medicine u različitim regionima Srbije i studenata drugih fakulteta. Uz odgovarajuće adaptacije za varijacije u dijalektu, instrument bi mogao da posluži i kao pouzdano i valjano sredstvo u crnogorskom, bosanskom i hrvatskom obrazovnom sistemu. Takve studije bi poboljšale naše razumevanje sličnosti i razlika u metakognitivnoj svesnosti među različitim studentskim populacijama. Štaviše, korišćenje srpske verzije MAI upitnika, kao pouzdanog alata za procenu, može da doprinese poboljšanju i usavršavanju obrazovnih programa u cilju unapređenja metakognitivnih veština, kao i da pomogne naučnicima u osmišljavanju i primeni fokusiranih i efikasnijih obrazovnih strategija, čime će se u perspektivi poboljšati ishodi učenja.

ZAKLJUČAK

Naša studija je pokazala da je srpska verzija MAI upitnika pouzdan i validan instrument za procenu metakognitivne svesnosti studenata medicine.

IZJAVE ZAHVALNOSTI

Autori zahvaljuju kolegama Vedrani Pavlović, Ognjenu Milićeviću, Aleksi Despotoviću, Kseniji Marković, i Nikoli Gruboru na pomoći u podsticanju studenata da učestvuju u ovoj studiji.

Sukob interesa: Nije prijavljen.

the importance of explicitly defining and quantifying cognitive knowledge and cognitive regulation. This is essential for the development of effective educational intervention plans and strategies.

Future studies can apply the Serbian version of the MAI questionnaire to assess the metacognitive awareness of medical students across different regions of Serbia and students majoring in other areas. With appropriate adaptations for variations in dialect, the instrument could also serve as a reliable and valid tool in the Montenegrin, Bosnian, and Croatian educational systems. Such studies would enhance our understanding of the similarities and differences in metacognitive awareness among various student populations. Moreover, the use of the Serbian version of the MAI questionnaire as a reliable assessment tool can inform the improvement and refinement of educational programs with the purpose of enhancing metacognitive skills, as well as help researchers in designing and implementing more targeted and effective educational strategies, ultimately improving learning outcomes.

CONCLUSION

The present study showed the Serbian version of the MAI questionnaire to be a reliable and valid tool for assessment the metacognitive awareness of medical students.

ACKNOWLEDGMENTS

The authors would like to express their gratitude to the following colleagues for their assistance in encouraging students to participate in this study: Vedrana Pavlović, Ognjen Milićević, Aleksa Despotović, Ksenija Marković, and Nikola Grubor.

Conflict of interest: None declared.

LITERATURA / REFERENCES

- Gündüz A, Gündoğmuş İ, Engin B, Bağlar G, Gündüz EBU. The validity and reliability of the Turkish version of the Meta-Worry Questionnaire. *Noro Psikiyatr Ars*. 2022 Aug 24;59(3):218-25. doi: 10.29399/npa.27926.
- Schraw G, Sperling Dennison R. Assessing Metacognitive Awareness. *Contemporary Educational Psychology*. 1994; 19 (4): 460-75. doi: 10.1006/ceps.1994.1033
- Flavell JH. Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *Am Psychol*. 1979 Oct;34(10):906-11. doi: 10.1037/0003-066X.34.10.906.
- Livingston JA. Metacognition: an overview. 2003. [Internet]. Available from: <https://files.eric.ed.gov/fulltext/ED474273.pdf>
- Metcalfe J, Shimamura APS. Metacognition. Knowing about knowing. Cambridge (MA), Bradford Book, Massachusetts Institute of Technology. 1994. doi: 10.7551/mitpress/4561.001.0001.
- Schraw G, Moshman D. Metacognitive theories. *Educational Psychology Review*. 1995 Dec;7(4):351-71.
- Dunlap, JC. Problem-based learning and self-efficacy: How a capstone course prepares students for a profession. *ETR&D*. 2005 Mar;53:65-83. doi: 10.1007/BF02504858.
- Maudsley G, Strivens J. 'Science', 'critical thinking' and 'competence' for tomorrow's doctors. A review of terms and concepts. *Med Educ*. 2000 Jan;34(1):53-60. doi: 10.1046/j.1365-2923.2000.00428.x.
- Molenaar I, Slegers P, van Boxtel C. Metacognitive scaffolding during collaborative learning: a promising combination. *Metacognition Learn*. 2014 Jul 17;9:309-32. doi: 10.1007/s11409-014-9118-y.
- Smith JM, Mancy R. Exploring the relationship between metacognitive and collaborative talk during group mathematical problem-solving – what do we mean by collaborative metacognition? *Res Math Educ*. 2018;20(1):14-36. doi: 10.1080/14794802.2017.1410215.
- Akin A, Abaci R, Çetin B. The validity and reliability of the Turkish version of the Metacognitive Awareness Inventory. *Educ Sci: Theory Pract*. 2007 May;7(2):671-8.
- Wild D, Grove A, Martin M, Eremenco S, McElroy S, Verjee-Lorenz A, et al.; ISPOR Task Force for Translation and Cultural Adaptation. Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) Measures: report of the ISPOR Task Force for Translation and Cultural Adaptation. *Value Health*. 2005 Mar-Apr;8(2):94-104. doi: 10.1111/j.1524-4733.2005.04054.x.
- Gutierrez de Blume AP, Montoya Londoño DM, Jiménez Rodríguez V, Morán Núñez O, Cuadro A, Daset L, et al. Psychometric properties of the Metacognitive Awareness Inventory (MAI): standardization to an international Spanish with 12 countries. *Metacognition Learn*. 2024 Jun 24;9:793-825. doi: 10.1007/s11409-024-09388-9.
- Omprakash A, Kumar AP, Kuppusamy M, Sathiyasekaran BWC, Ravinder T, Ramaswamy P. Validation of Metacognitive Awareness Inventory from a Private Medical University in India. *J Educ Health Promot*. 2021 Sep 30;10:324. doi: 10.4103/jehp.jehp_39_21.
- Craig K, Hale D, Grainger C, Stewart ME. Evaluating metacognitive self-reports: systematic reviews of the value of self-report in metacognitive research. *Metacognition Learn*. 2020 May 9;15:155-213. doi: 10.1007/s11409-020-09222-y.
- Li S, Xu J, Jia X, Zhao Y, Liu X, Wang Y. Translation and psychometric validation of the Chinese version of the metacognitive awareness scale among nursing students. *Front Psychol*. 2024 May 16;15:1354810. doi: 10.3389/fpsyg.2024.1354810.
- Tavakol M, Dennick R. Making sense of Cronbach's alpha. *Int J Med Educ*. 2011 Jun 27;2:53-5. doi: 10.5116/ijme.4dfb.8dfd.
- McDonald RP. Test theory: a unified treatment. Mahwah, NJ: Lawrence Erlbaum Associates. 1999.
- Hayes AF, Coutts JJ. (2020). Use Omega rather than Cronbach's alpha for estimating reliability. *But. ... Commun. Methods Meas*. 2020 Feb 11;14(1):1-24. doi: 10.1080/19312458.2020.1718629.

PRILOG 1

APPENDIX 1

UPITNIK ZA PROCENU METAKOGNITIVNE SVESNOSTI

Zamislite sebe dok učite. Pažljivo pročitajte svaku od navedenih tvrdnji. Svaku od njih označite u kojoj meri se odnosi na vas kada učite, tako što ćete zaokružiti odgovarajući broj:

(1) Uvek netačno (2) Ponekad netačno (3) Neutralno (4) Ponekad tačno (5) Uvek tačno

1. Povremeno se zapitam da li ostvarujem svoje ciljeve.	1	2	3	4	5
2. Pre nego što odgovorim sagledam nekoliko mogućih odgovora.	1	2	3	4	5
3. Trudim se da koristim strategije koje su ranije bile uspešne.	1	2	3	4	5
4. Određujem tempo dok učim kako bih imao/la dovoljno vremena.	1	2	3	4	5
5. Razumem svoje intelektualne prednosti i mane.	1	2	3	4	5
6. Razmislim šta zaista treba da naučim pre nego što počnem da radim.	1	2	3	4	5
7. Kada završim test, znam koliko dobro sam ga uradio/la.	1	2	3	4	5
8. Postavljam konkretne ciljeve pre nego što počnem da radim.	1	2	3	4	5
9. Usporim kad naiđem na važne informacije.	1	2	3	4	5
10. Znam koju vrstu informacija je najvažnije naučiti.	1	2	3	4	5
11. Pitam se da li sam razmotrio/la sve opcije prilikom rešavanja problema.	1	2	3	4	5
12. Dobar/ra sam u organizovanju informacija.	1	2	3	4	5
13. Svesno usmeravam pažnju na važne informacije.	1	2	3	4	5
14. Svaka strategija učenja koju koristim ima posebnu svrhu.	1	2	3	4	5
15. Najbolje učim kad znam ponešto o temi.	1	2	3	4	5
16. Znam šta profesor očekuje da naučim.	1	2	3	4	5
17. Dobro pamtim informacije.	1	2	3	4	5
18. Koristim različite strategije učenja u zavisnosti od situacije.	1	2	3	4	5
19. Kada završim zadatak, pitam se da li je postojao lakši način da ga uradim.	1	2	3	4	5
20. Imam kontrolu nad tim koliko dobro učim.	1	2	3	4	5
21. Povremeno ponovim gradivo da bih bolje razumeo/la povezanost važnih stvari.	1	2	3	4	5
22. Postavljam sebi pitanja o materijalu pre nego što počnem.	1	2	3	4	5
23. Razmislim o nekoliko načina da rešim problem i izaberem najbolji.	1	2	3	4	5
24. Nakon što završim sa učenjem, sumiram naučeno.	1	2	3	4	5
25. Pitam druge za pomoć kada nešto ne razumem.	1	2	3	4	5
26. Kada mi je potrebno, mogu da se motivišem da učim.	1	2	3	4	5
27. Svestan/na sam koje strategije koristim pri učenju.	1	2	3	4	5
28. Dok učim, uhvatim sebe kako analiziram korisnost strategija.	1	2	3	4	5
29. Koristim svoje intelektualne snage da nadoknadim svoje slabosti.	1	2	3	4	5
30. Fokusiram se na značenje i značaj novih informacija.	1	2	3	4	5
31. Kreiram sopstvene primere da informacije učinim smislenijim.	1	2	3	4	5
32. Dobro procenjujem koliko dobro nešto razumem.	1	2	3	4	5
33. Uхватim sebe kako automatski koristim korisne strategije učenja.	1	2	3	4	5
34. Uхватim sebe kako redovno pravim pauze da proverim svoje razumevanje.	1	2	3	4	5
35. Znam kada će svaka strategija koju koristim biti najefikasnija.	1	2	3	4	5
36. Pitam se koliko dobro postizem svoje ciljeve kada završim.	1	2	3	4	5
37. Crtam slike ili dijagrame da mi pomognu da razumem dok učim.	1	2	3	4	5
38. Pitam se da li sam razmotrio/la sve opcije nakon što rešim problem.	1	2	3	4	5
39. Pokušam da preformulišem nove informacije svojim rečima.	1	2	3	4	5
40. Menjam strategije kada ne uspe da razumem.	1	2	3	4	5
41. Koristim organizaciju strukture teksta da mi pomogne u učenju.	1	2	3	4	5
42. Pažljivo čitam uputstva pre nego što započnem zadatak.	1	2	3	4	5
43. Pitam se da li je ono što čitam povezano sa onim što već znam.	1	2	3	4	5
44. Preispitujem svoje pretpostavke kada se zbunim.	1	2	3	4	5
45. Organizujem svoje vreme da najbolje ostvarim svoje ciljeve.	1	2	3	4	5
46. Učim više kada me zanima tema.	1	2	3	4	5
47. Pokušavam da rasporedim učenje na manje korake.	1	2	3	4	5
48. Fokusiram se na opšte značenje, a ne na specifičnosti.	1	2	3	4	5
49. Postavljam sebi pitanja o tome koliko mi dobro ide dok učim nešto novo.	1	2	3	4	5
50. Pitam se da li sam naučio/la onoliko koliko sam mogao/la kada završim zadatak.	1	2	3	4	5
51. Zastanem i vratim se na nove informacije koje su nejasne.	1	2	3	4	5
52. Zastanem i ponovo pročitam kada se zbunim.	1	2	3	4	5

REVERZIBILNI OČNI NEŽELJENI EFEKTI U TRETMANU MELANOMA MEK/BRAF INHIBITORIMA

PRIKAZ SLUČAJA

CASE REPORT

REVERSIBLE OCULAR ADVERSE EFFECTS IN MELANOMA TREATMENT WITH MEK/BRAF INHIBITORS

Dolika D. Vasović¹, Dejan M. Rašić^{1,2}, Ivan Marjanović^{1,2}, Tanja Kalezić^{1,2}, Margita Lučić¹

¹ Univerzitetski klinički centar Srbije, Klinika za očne bolesti, Beograd, Srbija

¹ University Clinical Center of Serbia, Eye Hospital, Belgrade, Serbia

² Univerzitet u Beogradu, Medicinski fakultet, Beograd, Srbija

² University of Belgrade, Faculty of Medicine, Belgrade, Serbia

SAŽETAK

Uvod: MEK/BRAF inhibitori, uključujući cobimetinib i vemurafenib, efikasni su u lečenju BRAF pozitivnog metastatskog melanoma kože. Iako delotvorni, mogu izazvati ozbiljne okularne neželjene efekte. Ove komplikacije mogu značajno uticati na kvalitet života pacijenata i nastavak primene terapije. U radu je prikazan slučaj 57-godišnje pacijentkinje koja je razvila okularne neželjene efekte osam meseci nakon početka primene terapije MEK/BRAF inhibitorima, što naglašava potrebu za ranom identifikacijom i lečenjem okularnih neželjenih efekata.

Prikaz slučaja: Pacijentkinja starosti 57 godina, primala je MEK/BRAF inhibitore (cobimetinib i vemurafenib) tokom osam meseci nakon operacije melanoma kože. Tokom lečenja, razvila je neželjene efekte u vidu prednjeg uveitisa, vitritisa i akumulacije subretinalnog fluida u predelu makularne regije oba oka, što je dovelo do bilateralnog smanjenja ostrine vida. Nakon prekida primene terapije u trajanju od tri nedelje, dolazi do značajnog poboljšanja stanja sa povratkom ostrine vida na 20/20. Dodatnim ispitivanjem pokazano je povlačenje upalnog procesa i resorpcija subretinalne tečnosti, što ukazuje da su neželjeni efekti bili povezani sa primenom terapije, a ne sa metastatskom bolešću.

Zaključak: Ovaj slučaj naglašava važnost prepoznavanja i lečenja neželjenih efekata povezanih sa MEK/BRAF inhibitorima. Iako retke, ove komplikacije mogu ozbiljno uticati na kvalitet života pacijenata i nastavak primene terapije. Multidisciplinarni pristup, koji uključuje onkologe i oftalmologe, ključan je za praćenje i rešavanje ovih problema. Potrebna su dodatna istraživanja kako bi se bolje razumeli mehanizmi ovih neželjenih efekata i unapredile strategije upravljanja za pacijente koji primaju ciljanu terapiju metastatskog melanoma kože.

Ključne reči: melanom, okularna toksičnost, MEK/BRAF inhibitori

ABSTRACT

Introduction: MEK/BRAF inhibitors, including cobimetinib and vemurafenib, are effective in managing BRAF-mutant melanoma. Despite their efficacy, these therapies may cause adverse effects, including ocular toxicities. Although uncommon, these complications can significantly impact a patient's quality of life and adherence to treatment. This case report highlights a 57-year-old female who developed ocular side effects during MEK/BRAF inhibitor therapy, underscoring the need for early recognition and management.

Case report: A 57-year-old female received MEK/BRAF inhibitors (cobimetinib and vemurafenib) for eight months after surgery for skin melanoma. During treatment, she developed significant ocular adverse effects, including bilateral pigmented keratic precipitates, anterior chamber inflammation, and vitritis, resulting in reduced visual acuity. Ophthalmologic examination revealed signs of inflammation, prompting a three-week suspension of the therapy. After discontinuing the treatment, the patient experienced marked improvement, with her visual acuity returning to 20/20. Subsequent examinations confirmed the resolution of ocular symptoms, indicating that the adverse events were linked to the therapy rather than metastatic disease.

Conclusion: This case highlights the importance of identifying and managing ocular toxicities associated with MEK/BRAF inhibitors. Although rare, these complications can severely affect quality of life and treatment continuation. A multidisciplinary approach, involving both oncologists and ophthalmologists, is essential for monitoring and addressing these issues. Further research is needed to better understand the mechanisms behind these adverse effects and to improve management strategies for patients on targeted melanoma therapy.

Keywords: melanoma, ocular toxicity, MEK/BRAF inhibitors

Autor za korespondenciju:

Dolika D. Vasović

Klinika za očne bolesti, Univerzitetski klinički centar Srbije

Pasterova 2, 11000 Beograd, Srbija

Elektronska adresa: dolika.vasovic@gmail.com

Corresponding author:

Dolika D. Vasović

Eye Hospital, University Clinical Center of Serbia

2 Pasterova Street, 11000 Belgrade, Serbia

E-mail: dolika.vasovic@gmail.com

Primljeno • Received: September 24, 2024; **Revidirano • Revised:** November 7, 2024; **Prihvaćeno • Accepted:** November 13, 2024; **Online first:** December 25, 2024

DOI: 10.5937/smdlk5-53696

UVOD

Melanom, maligni tumor melanocita, predstavlja značajan izazov za lečenje zbog svoje agresivne prirode i sklonosti ka metastaziranju. Pojava ciljanih terapija, posebno BRAF i MEK inhibitora, revolucionarizovala je lečenje BRAF-mutiranog melanoma, dovodeći do značajnih poboljšanja u stopama preživljavanja i kontroli bolesti. BRAF (B-Raf proto-onkogen) igra ključnu ulogu u MAPK (mitogen-aktiviranoj proteinskoj kinazi) signalnoj putanji, koja je integralna za regulaciju rasta i deobe ćelija. Mutacije u BRAF genu, posebno V600E mutacija, prisutne su u otprilike 40-60% slučajeva melanoma [1,2]. BRAF inhibitori, kao što su vemurafenib i dabrafenib, ciljaju specifično ovaj mutirani protein, što dovodi do smanjenja proliferacije tumorskih ćelija i povećanja apoptoze. Selektivnim vezivanjem za mutirani BRAF protein, ovi inhibitori sprečavaju njegovu kinaznu aktivnost, blokirajući tako fosforilaciju i aktivaciju nizvodnih efekatora u MAPK putanji [3].

MEK (mitogen-aktivirana proteinska kinaza kinaza), koja se nalazi nizvodno od BRAF, predstavlja još jednog ključnog igrača u MAPK putanji. MEK inhibitori, uključujući trametinib i cobimetinib, dodatno ometaju signalni kaskad koji pospešuje preživljavanje i rast ćelija raka [4]. Kada se kombinuju sa BRAF inhibitorima, MEK inhibitori povećavaju terapijsku efikasnost i smanjuju otpornost koja se često javlja kod BRAF monoterapije. Ova dupla blokada poboljšala je stope odgovora i preživljavanje bez progresije bolesti kod pacijenata sa BRAF-mutiranim melanomom [5].

Uprkos svojoj efikasnosti, ove terapije su povezane sa različitim neželjenim efektima. Uobičajeni neželjeni efekti uključuju toksičnost kože, kao što su osip i fotosenzitivnost, gastrointestinalne simptome poput dijareje i mučnine, kao i metaboličke promene, uključujući povećane nivoe jetrenih enzima [6]. Među ovim neželjenim efektima, okularne komplikacije, iako relativno retke, privukle su pažnju zbog mogućeg značajnog uticaja na kvalitet života pacijenata. Okularne komplikacije povezane sa MEK/BRAF inhibitorima mogu uključivati uveitis, karakterisan upalom uvealnog trakta, što dovodi do simptoma kao što su zamućen vid, bol u oku i crvenilo [7]. Pacijenti takođe mogu doživeti sindrom suvog oka, karakterisan smanjenom produkcijom suza ili promenjenim sastavom suza, što izaziva nelagodnost i smetnje u vidu. Pored toga, retinalna toksičnost predstavlja rizik, potencijalno utičući na funkciju ili strukturu retine i dovodeći do promena u vidu.

Prepoznavanje i upravljanje ovim okularnim neželjenim efektima ključno je za optimizaciju ishoda lečenja i održavanje pridržavanja terapije. Uvođenje MEK i BRAF inhibitora zaista je transformisalo pristup lečenju melanoma, pružajući značajne koristi pacijentima sa

INTRODUCTION

Melanoma, a malignant tumor of melanocytes, presents significant treatment challenges due to its aggressive nature and tendency to metastasize. The advent of targeted therapies, particularly BRAF and MEK inhibitors, has revolutionized the management of BRAF-mutant melanoma, leading to marked improvements in survival rates and disease control. BRAF (B-Raf proto-oncogene) plays a crucial role in the MAPK (mitogen-activated protein kinase) signaling pathway, which is integral to regulating cell growth and division. Mutations in the BRAF gene, notably the V600E mutation, occur in approximately 40-60% of melanoma cases [1,2]. BRAF inhibitors, such as vemurafenib and dabrafenib, specifically target this mutated protein, resulting in decreased tumor cell proliferation and increased apoptosis. By selectively binding to the mutated BRAF protein, these inhibitors inhibit its kinase activity, thereby blocking the phosphorylation and activation of downstream effectors in the MAPK pathway [3].

MEK (mitogen-activated protein kinase kinase), located downstream of BRAF, is another key player in the MAPK pathway. MEK inhibitors, including trametinib and cobimetinib, further disrupt the signaling cascade that promotes cancer cell survival and growth [4]. When combined with BRAF inhibitors, MEK inhibitors enhance therapeutic efficacy and mitigate resistance often seen with BRAF monotherapy. This dual blockade has improved response rates and progression-free survival in patients with BRAF-mutant melanoma [5].

Despite their effectiveness, these therapies are associated with various side effects. Common adverse effects include skin toxicities, such as rash and photosensitivity, gastrointestinal symptoms like diarrhea and nausea, and metabolic changes, including elevated liver enzymes [6]. Among these side effects, ocular complications, though relatively rare, have garnered attention due to their potential to significantly impact patients' quality of life. Ocular complications associated with MEK/BRAF inhibitors can include uveitis, characterized by inflammation of the uveal tract, leading to symptoms such as blurred vision, eye pain, and redness [7]. Patients may also experience dry eye syndrome, characterized by reduced tear production or altered tear composition, resulting in discomfort and visual disturbances. Additionally, retinal toxicity poses a risk, potentially affecting retinal function or structure and leading to vision changes.

Recognizing and managing these ocular adverse effects is crucial for optimizing treatment outcomes and maintaining adherence to therapy. The introduction of MEK and BRAF inhibitors has indeed transformed the treatment landscape for melanoma,

BRAF mutacijama. Međutim, kontinuirana svest o potencijalnim neželjenim efektima, posebno okularnim komplikacijama, suštinska je za sveobuhvatnu negu pacijenata. Dalja istraživanja i prikazi slučajeva dodatno će razjasniti ove efekte i unaprediti strategije upravljanja, što će naposljetku poboljšati celokupno iskustvo lečenja za pacijente sa melanomom.

Ovaj prikaz slučaja ima za cilj da istakne pojavu reverzibilnih okularnih neželjenih efekata kod pacijenta na terapiji MEK/BRAF inhibitorima zbog BRAF-mutiranog melanoma. Dokumentovanjem kliničke slike pacijenta i njegovog odgovora na terapiju, želimo da podignemo svest među zdravstvenim radnicima o potencijalnim okularnim toksičnostima povezanim sa ovim ciljanim terapijama. Pored toga, ovaj prikaz naglašava važnost multidisciplinarnog praćenja i upravljanja kako bi se optimizovali ishodi lečenja i održao kvalitet života tokom terapije.

PRIKAZ SLUČAJA

Ovaj prikaz slučaja opisuje kliničko iskustvo 57-godišnje pacijentkinje koja je primala terapiju MEK/BRAF inhibitorima, cobimetinibom i vemurafenibom, osam meseci nakon operacije melanoma kože. Uvođenje ciljane terapije bilo je deo plana lečenja zbog prisustva BRAF mutacija, koje su često povezane s agresivnim ponašanjem melanoma.

Pacijentkinja se prvobitno javila sa smanjenjem vidne oštine, sa vrednostima od 20/40 na desnom oku i 20/30 na levom oku. Klinički pregled otkrio je značajne nalaze, uključujući bilateralne pigmentovane keratičke precipitate (KP) na endotelu rožnjače, što je izazvalo zabrinutost zbog moguće upale ili toksičnosti usled terapije melanoma. Pored toga, pregled je pokazao prisustvo ćelija u prednjoj očnoj komori (2+), što ukazuje na upalne promene u oku. Zabeležena je i zadnja sinehija, koja se karakteriše pripojem dužice za sočivo (Slika 1). Prisustvo vitritisa (3+) ukazivalo je na značajnu upalu unutar staklastog tela, dok je subretinalna tečnost u makuli izazvala zabrinutost zbog ozbiljnih okularnih komplikacija ili potencijalne metastaze. Dalje dijagnostičko snimanje i testiranje, uključujući optičku koherentnu tomografiju (OCT) i ultrazvuk B-sken, isključili su metastaze, ukazujući na to da je subretinalna tečnost verovatno rezultat inflamacije izazvane terapijom, a ne novi tumor.

Na osnovu ovih nalaza, doneta je odluka da se privremeno obustavi primena cobimetiniba i vemurafeniba na tri nedelje. Ova pauza u terapiji bila je ključna kako bi se procenilo da li su okularni simptomi povezani s terapijom. Nakon tronedeljne pauze, pacijentkinja je iskusiila značajno poboljšanje simptoma. Prilikom ponovnog pregleda, vidna oština se vratila na 20/20

providing substantial benefits for patients with BRAF mutations. However, ongoing awareness of potential adverse effects, particularly ocular complications, is essential for comprehensive patient care. Continued research and case studies will further elucidate these effects and enhance management strategies, ultimately improving the overall treatment experience for melanoma patients.

This case report aims to highlight the occurrence of reversible ocular adverse effects in a patient undergoing treatment with MEK/BRAF inhibitors for BRAF-mutant melanoma. By documenting the patient's clinical presentation and response to therapy, we seek to raise awareness among healthcare providers about the potential ocular toxicities associated with these targeted treatments. Additionally, this report emphasizes the importance of multidisciplinary monitoring and management to optimize patient outcomes and maintain quality of life during therapy.

CASE REPORT

This case report documents the clinical experience of a 57-year-old female patient undergoing treatment with the MEK/BRAF inhibitors cobimetinib and vemurafenib for eight months following surgery for skin melanoma. The initiation of targeted therapy was part of her management plan due to the presence of BRAF mutations, which are commonly associated with aggressive melanoma behavior.

The patient initially presented with complaints of reduced visual acuity, with measurements of 20/40 in her right eye and 20/30 in her left eye. Clinical assessment revealed notable findings, including bilateral pigmented keratic precipitates (KPs) on the corneal endothelium, raising concerns about potential inflammation or toxicity resulting from the ongoing melanoma treatment. Additionally, the examination indicated (2+) anterior chamber cells, suggesting inflammatory changes in the eye. Posterior synechia, characterized by the adhesion of the iris to the lens, was also noted (Figure 1). The presence of (3+) vitritis pointed to significant inflammation within the vitreous cavity, while subretinal fluid in the macula raised concerns about serious ocular complications or potential metastasis. Further diagnostic imaging and testing, including optical coherence tomography (OCT) and ultrasound B-scan, ruled out metastasis, indicating that the subretinal fluid was likely a result of treatment-related inflammation rather than a new tumor.

Given these findings, a decision was made to temporarily suspend the administration of cobimetinib and vemurafenib for three weeks. This pause in therapy was critical to assess whether the ocular symptoms were

na oba oka, što ukazuje na izuzetan oporavak. Praćenje je pokazalo znatno smanjenje bilateralnih pigmentovanih keratičkih precipitata i povlačenje inflamacije u prednjoj očnoj komori, uz smanjenje ili odsustvo ćelija u prednjoj komori. Poboljšanje vitritisa i odsustvo subretinalne tečnosti dodatno su sugerisali da se upala povukla.

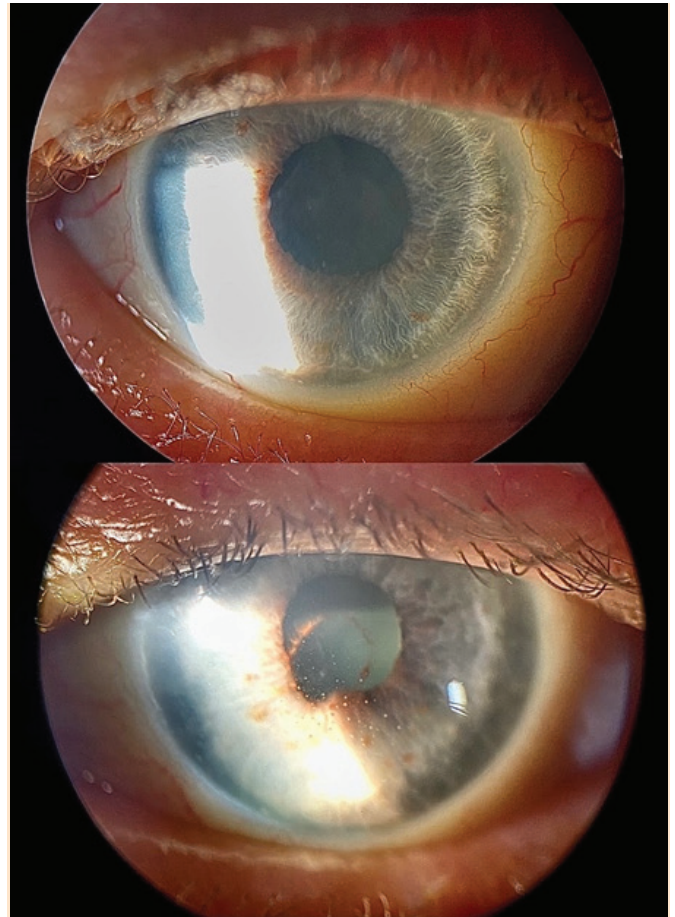
Tokom narednih kontrolnih pregleda u periodu od šest meseci nakon ponovnog uvođenja terapije u smanjenoj dozi, pacijentkinja je ostala dobrog zdravstvenog stanja, bez znakova progresije bolesti, a okularni simptomi su se nastavili povlačiti bez ponovnog pojavljivanja. Ovaj slučaj naglašava važnost ranog prepoznavanja okularnih neželjenih efekata i reverzibilnost simptoma uz pravovremeno upravljanje, kao što je privremena obustava ciljane terapije. Blisko multidisciplinarno praćenje, uključujući oftalmološke preglede, ključno je za optimizaciju ishoda lečenja pacijenta, dok se osigurava da terapija melanoma ostane efikasna i podnošljiva.

DISKUSIJA

Slučaj 57-godišnje pacijentkinje ističe značajne okularne neželjene efekte povezane s MEK/BRAF inhibitorima, posebno cobimetinibom i vemurafenibom, u lečenju melanoma. Kako se primena ciljane terapije povećava, tako raste i prepoznavanje potencijalnih okularnih toksičnosti, koje mogu značajno uticati na kvalitet života pacijenata i njihovu pridržanost terapiji.

Nekoliko studija dokumentovalo je okularne komplikacije povezane s ciljanom terapijom kod pacijenata s melanomom. Na primer, pregled Martens et al. (iz 2023.) istakao je da su okularni neželjeni efekti poput uveitisa, sindroma suvog oka i retinalne toksičnosti zabeleženi kod pacijenata lečenih BRAF i MEK inhibitorima [8]. Ovi nalazi potvrđeni su izveštajima o sličnim komplikacijama, uključujući bilateralne keratičke precipitate i upalne promene u prednjoj komori oka [7]. Mehanizam koji stoji iza ovih okularnih efekata može uključivati imunomodulirajuća svojstva ovih agenasa, koji mogu izazvati upalne reakcije kod pacijenata koji su podložni ovim komplikacijama.

U literaturi postoji više dokumentovanih slučajeva pacijenata koji su iskusili značajne okularne neželjene efekte tokom terapije MEK/BRAF inhibitorima. Na primer, u slučaju koji su 2017. izvestili Sarny et al. opisano je da je pacijent razvio uveitis i keratitis tokom terapije dabrafenibom i trametinibom, što je zahtevalo privremenu obustavu terapije [9]. Ovaj pristup podudara se s našim načinom upravljanja u ovom slučaju, naglašavajući važnost pažljivog praćenja i pravovremene intervencije u upravljanju okularnim toksičnostima kod ove populacije pacijenata [9].



Slika 1. Fotografije prednjeg segmenta desnog i levog oka pri prvom pregledu.

Picture 1. Anterior segment photographs of the right and left eyes at presentation.

related to the treatment. Following the three-week suspension, the patient experienced a significant improvement in her symptoms. Upon reevaluation, visual acuity had returned to 20/20 in both eyes, indicating a remarkable recovery. Follow-up assessments showed a marked reduction in bilateral pigmented keratic precipitates and resolution of anterior chamber inflammation, with decreased or absent anterior chamber cells. Improvement in vitritis and the absence of subretinal fluid further suggested that the inflammation had subsided.

During subsequent follow-up appointments over a six-month period after therapy was reintroduced at a reduced dosage, the patient remained in good health with no indication of disease progression, and the ocular symptoms continued to resolve without recurrence. This case highlights the importance of early recognition of ocular adverse effects and the reversibility of symptoms with timely management, such as temporary discontinuation of targeted therapy. Close multidisciplinary monitoring, including ophthalmologic evaluations, is essential for optimizing patient outcomes while ensuring that treatment for melanoma remains effective and tolerable.

Reverzibilnost okularnih simptoma nakon prekid terapije, kako je primećeno kod naše pacijentkinje, usklađena je s nalazima iz drugih studija. U seriji slučajeva koju su 2021. opisali Nguyen et al., pacijenti su prijavili povlačenje vizuelnih poremećaja i upalnih znakova nakon prekida terapije BRAF/MEK inhibitorima, što naglašava potrebu za ranom identifikacijom i odgovarajućim upravljanjem ovih neželjenih efekata [10].

U upravljanju okularnim neželjenim efektima povezanim s cobimetinibom i vemurafenibom, privremeni prekid terapije predstavlja uobičajeno preporučeni pristup. Trajanje ovih pauza u terapiji varira u zavisnosti od ozbiljnosti simptoma i individualnog odgovora svakog pacijenta. Na primer, jedan izveštaj opisao je slučaj pacijenta koji je razvio uveitis nakon šest nedelja terapije cobimetinibom i vemurafenibom. Terapija je prekinuta na tri nedelje, tokom kojih su se okularni simptomi poboljšali, a nakon ponovnog uvođenja terapije u smanjenoj dozi, nije primećeno ponovno javljanje simptoma tokom šestomesečnog praćenja. Ovaj slučaj sugerise da tronedeljna suspenzija može efikasno rešiti okularne neželjene efekte bez kompromitovanja dugoročne efikasnosti terapije [11].

Štaviše, studija koja je pregledala okularne toksičnosti povezane s MEK inhibitorima, uključujući cobimetinib, istakla je da, iako su mnogi okularni neželjeni efekti samolimitirajući, neki mogu zahtevati privremeni prekid terapije. Tačno trajanje ovih prekida često je individualizovano na osnovu odgovora pacijenta i težine simptoma, što dodatno podržava fleksibilan, pacijentom usmeren pristup.

Uspešan oporavak vidne oštine pacijentkinje na 20/20, zajedno s povlačenjem okularnih simptoma, naglašava potrebu za multidisciplinarnim pristupom u upravljanju pacijentima s melanomom koji su na ciljanoj terapiji. Onkolozi i oftalmolozi treba blisko da sarađuju kako bi pratili okularne komplikacije, posebno kod pacijenata koji ispolje promene u vidu.

ZAKLJUČAK

U zaključku, iako su MEK/BRAF inhibitori značajno poboljšali ishode kod pacijenata sa BRAF-mutantnim melanomom, svest o mogućim okularnim neželjenim efektima je od suštinskog značaja. Naš slučaj doprinosi rastućoj literaturi koja naglašava važnost budnosti i proaktivnog upravljanja okularnim komplikacijama u okviru ove terapije. Potrebna su dalja istraživanja kako bi se bolje razumeli mehanizmi koji stoje iza ovih neželjenih efekata i razvile strategije za prevenciju i upravljanje.

Sukob interesa: Nije prijavljen.

DISCUSSION

The case of the 57-year-old female patient highlights significant ocular adverse effects associated with MEK/BRAF inhibitors, specifically cobimetinib and vemurafenib, in the treatment of melanoma. As the use of targeted therapies has increased, so has the recognition of their potential ocular toxicities, which can profoundly affect patients' quality of life and treatment adherence.

Several studies have documented ocular complications related to targeted therapies in melanoma patients. For instance, a review by Martens et al. (2023) noted that ocular adverse effects such as uveitis, dry eye syndrome, and retinal toxicity have been observed in patients treated with BRAF and MEK inhibitors [8]. These findings are corroborated by case reports indicating similar complications, including bilateral keratic precipitates and inflammatory changes in the anterior chamber [7]. The mechanism underlying these ocular effects may involve the immune-modulating properties of these agents, which can elicit inflammatory responses in susceptible patients.

In the literature, there are multiple documented cases of patients experiencing significant ocular adverse effects during treatment with MEK/BRAF inhibitors. For example, a case reported by Sarny et al. (2017) described a patient who developed uveitis and keratitis while on dabrafenib and trametinib, requiring the temporary suspension of therapy [9]. This approach mirrors the management strategy used in our case, underscoring the importance of careful monitoring and timely intervention in managing ocular toxicities within this patient population [9].

The reversibility of ocular symptoms upon discontinuation of therapy, as observed in our patient, aligns with findings from other studies. In a case series by Nguyen et al. (2021), patients reported resolution of visual disturbances and inflammatory signs after halting BRAF/MEK inhibitor treatment, highlighting the necessity of early recognition and appropriate management of these adverse effects [10].

In managing ocular side effects associated specifically with cobimetinib and vemurafenib, temporary discontinuation is a commonly recommended approach. The duration of these pauses in therapy varies depending on the severity of symptoms and the individual response of each patient. For instance, one case report described a patient who developed uveitis after six weeks of cobimetinib and vemurafenib treatment. Therapy was paused for three weeks, during which the patient's ocular symptoms improved, and upon resuming at a reduced dosage, no recurrence of symptoms was observed over a six-month follow-up period. This

LITERATURA / REFERENCES

1. Tímár J, Ladányi A. Molecular pathology of skin melanoma: epidemiology, differential diagnostics, prognosis and therapy prediction. *Int J Mol Sci.* 2022 May 11;23(10):5384. doi: 10.3390/ijms23105384.
2. Ottaviano M, Giunta EF, Tortora M, Curvietto M, Attademo L, Bosso D, et al. BRAF gene and melanoma: back to the future. *Int J Mol Sci.* 2021 Mar 27;22(7):3474. doi: 10.3390/ijms22073474.
3. Flaherty KT, Puzanov I, Kim KB, Ribas A, McArthur GA, Sosman JA, et al. Inhibition of mutated, activated BRAF in metastatic melanoma. *N Engl J Med.* 2010 Aug 26;363(9):809-19. doi: 10.1056/NEJMoa1002011.
4. Long GV, Stroyakovskiy D, Gogas H, Levchenko E, de Braud F, Larkin J, et al. Combined BRAF and MEK inhibition versus BRAF inhibition alone in melanoma. *N Engl J Med.* 2014 Nov 13;371(20):1877-88. doi: 10.1056/NEJMoa1406037.
5. Dummer R, Ascierto PA, Gogas HJ, Arance A, Mandala M, Liszkay G, et al. Encorafenib plus binimetinib versus vemurafenib or encorafenib in patients with BRAF-mutant melanoma (COLUMBUS): a multicentre, open-label, randomised phase 3 trial. *Lancet Oncol.* 2018 May;19(5):603-15. doi: 10.1016/S1470-2045(18)30142-6.
6. Robert C, Schachter J, Long GV, Arance A, Grob JJ, Mortier L, et al. Pembrolizumab versus ipilimumab in advanced melanoma. *N Engl J Med.* 2015 Jun 25;372(26):2521-32. doi: 10.1056/NEJMoa1503093.
7. Hecht M, Zimmer L, Loquai C, Weishaupt C, Gutzmer R, Schuster B, et al. Radiosensitization by BRAF inhibitor therapy-mechanism and frequency of toxicity in melanoma patients. *Ann Oncol.* 2015 Jun;26(6):1238-44. doi: 10.1093/annonc/mdv139.
8. Martens A, Schauwvlieghe PP, Madoe A, Casteels I, Aspeslagh S. Ocular adverse events associated with immune checkpoint inhibitors, a scoping review. *J Ophthalmic Inflamm Infect.* 2023 Feb 22;13(1):5. doi: 10.1186/s12348-022-00321-2.
9. Sarny S, Neumayer M, Kofler J, El-Shabrawi Y. Ocular toxicity due to trametinib and dabrafenib. *BMC Ophthalmol.* 2017 Aug 17;17(1):146. doi: 10.1186/s12886-017-0541-0.
10. Gavric AU, Ocvirk J, Mekjavic PJ. Ocular changes in metastatic melanoma patients treated with mek inhibitor cobimetinib and braf inhibitor vemurafenib. *Radiol Oncol.* 2018 Jan 24;52(2):213-9. doi: 10.2478/raon-2018-0002.
11. Jeng-Miller KW, Miller MA, Heier JS. Ocular effects of MEK inhibitor therapy: Literature review, clinical presentation, and best practices for mitigation. *Oncologist.* 2024;29(5): e616-21. doi:10.1093/oncolo/oyae014.

case suggests that a three-week suspension can effectively resolve ocular adverse effects without compromising the long-term efficacy of the treatment [11].

Moreover, a study reviewing ocular toxicities associated with MEK inhibitors, including cobimetinib, noted that while many ocular side effects are self-limiting, some may require temporary discontinuation. The exact duration of these therapy interruptions is often individualized based on patient response and the severity of symptoms, further supporting a flexible, patient-centered approach.

The successful recovery of our patient's visual acuity to 20/20, along with the resolution of ocular symptoms, reinforces the necessity for a multidisciplinary approach in managing melanoma patients on targeted therapies. Oncologists and ophthalmologists should collaborate closely to monitor for ocular complications, particularly in patients presenting with visual changes.

CONCLUSION

In conclusion, while MEK/BRAF inhibitors have significantly improved outcomes for patients with BRAF-mutant melanoma, awareness of potential ocular adverse effects is essential. Our case adds to the growing body of literature that underscores the importance of vigilance and proactive management of ocular complications in this treatment landscape. Further research is warranted to better understand the mechanisms behind these adverse effects and to develop strategies for prevention and management.

Conflict of interest: None declared.

PENOSKROTALNA PAGETOVA BOLEST – PRIKAZ SLUČAJA I PREGLED LITERATURE

PRIKAZ SLUČAJA

CASE REPORT

PENOSCROTAL PAGET'S DISEASE – CASE REPORT AND LITERATURE REVIEW

Luka Pejnović¹, Igor Đurišić¹, Ognjen Živković¹, Ognjen Petrović¹,
Ivana Petrović¹, Zorka Inić^{1,2}, Ivan Marković^{1,2}

¹ Institut za onkologiju i radiologiju Srbije, Beograd, Srbija

¹ Institute of Oncology and Radiology of Serbia, Belgrade, Serbia

² Univerzitet u Beogradu, Medicinski fakultet, Beograd, Srbija

² University of Belgrade, Faculty of Medicine, Belgrade, Serbia

SAŽETAK

Uvod: Penoskrotalna Pagetova bolest je veoma retka u svetu, sa malim brojem prikaza slučajeva, te tako predstavlja veliku dilemu u dijagnostici i lečenju.

Prikaz slučaja: Muškarac starosti od 81 godine javlja se prvi put na Institut za onkologiju i radiologiju Srbije (IORS), zbog ulcerisane i eritematozne tumorske promene promera oko 10 cm prekrivene skvamoznim pločama, koja se proteže od preponske regije levo do skrotuma. Tumefakt je eritematozan, prokrvljen i povremeno krvavi, a pacijent od tegoba navodi povremeni bol u levoj nozi. Prethodno je učinjena biopsija navedene tumorske promene u drugoj ustanovi, a patohistološki (PH) nalaz je išao u prilog ektramamarnoj Pagetovoj bolesti. Pacijent je prezentovan konzilijumu IORS-a, koji je doneo odluku o operativnom lečenju.

Zaključak: Ova bolest se nalazi i izvan klinički vidljivih lezija, pozitivne ivice resekcije su česte, a to predstavlja glavni faktor rizika za recidiv bolesti. Tačna preoperativna dijagnoza i pravilno hiruško lečenje, predstavljaju adekvatno lečenje, kojim se izbegava pojava recidiva i ponovnih operacija, što je svakako ključan faktor u preživljavanju. Ovaj prikaz slučaja za onkologe svakako predstavlja značajan korak ka razumevanju ove bolesti.

Ključne reči: penoskrotalna Pagetova bolest, ivice resekcije, recidiv bolesti, adekvatno lečenje

ABSTRACT

Introduction: Penoscrotal Paget's disease is very rare worldwide, with a small number of case reports, and it thus represents a major dilemma in diagnosis and treatment.

Case report: An 81-year-old man presents himself to the Institute of Oncology and Radiology of Serbia (IORS) for the first time due to an ulcerated and erythematous tumor change about 10 cm in diameter covered with squamous plates, which extends from the groin region on the left to the scrotum. The tumefaction is erythematous, bloody and it occasionally bleeds, and the patient complains of occasional pain in the left leg. Previously, a biopsy of the mentioned tumor change was performed in another institution, and the PH finding was in favor of extramammary Paget's disease. The patient was presented to the IORS council, which decided on operative treatment.

Conclusion: This rare disease is also found outside of clinically visible lesions, positive resection margins are common, and this represents the main risk factor for disease recurrence. Accurate preoperative diagnosis and proper surgical treatment are crucial for preventing relapses and repeat operations, making them key factors in improving survival. This case report certainly represents a significant step for oncologists in understanding this disease.

Keywords: penoscrotal Paget's disease, resection margins, disease recurrence, adequate treatment

Autor za korespondenciju:

Luka Pejnović

Institut za onkologiju i radiologiju Srbije

Pasterova 14, 11000 Beograd, Srbija

Elektronska adresa: lpejnovic14@gmail.com

Corresponding author:

Luka Pejnović

Institute of Oncology and Radiology of Serbia

14 Pasterova Street, 11000 Belgrade, Serbia

E-mail: lpejnovic14@gmail.com

Primljeno • Received: July 10, 2024; **Revidirano • Revised:** August 10, 2024; **Prihvaćeno • Accepted:** August 20, 2024; **Online first:** December 25, 2024

DOI: 10.5937/smcl5-52092

UVOD

Ekstramamarna Pagetova bolest (EMPB) je redak intraepitelni malignitet koji nastaje u oblastima bogatim apokrinim žlezdama, kao što su perineum, vulva, aksila, skrotum i penis [1]. Tačna patogenezna EMPB još uvek nije u potpunosti razjašnjena. Trenutni podaci govore o tome da je EMPB heterogena bolest koja može biti primarna i sekundarna. Primarni EMPB vodi poreklo iz kože, tačnije iz epiderma ili apokrinih znojnih žlezda. Ovaj oblik je u početku ograničen na epitel, ali može da napreduje do invazivnog tumora koji se širi u derm, krvne i limfne sudove, a u uznapredovalom stadijumu može dati limfonodalne ili visceralne metastaze. Sekundarni oblik EMPB je povezan sa širenjem malignih ćelija adenokarcinoma poreklom iz dermalnih adneksalnih žlezdi ili unutar susednog epitela, obično genitourinarnog ili gastrointestinalnog [2]. Incidenca ekstramamarne Pagetove bolesti je 6 na 1 000 000 ljudi godišnje [3], dok penoskrotalna EMPB obuhvata svega 14% svih EMPB [4].

Predstavljamo Vam slučaj osamdeset-jednogodišnjeg muškarca sa penoskrotalnom EMPB.

PRIKAZ SLUČAJA

Muškarac starosti od 81 godine javlja se prvi put 9.2.2023. godine na Institut za onkologiju i radiologiju Srbije (IORS) zbog ulcerisane i eritematozne tumorne promene promera oko 10 cm prekrivene skvamoznim pločama, koja se proteže od preponske regije levo do skrotuma. Tumefakt je eritematozan, prokrvljuen i povremeno krvari, a pacijent od tegoba navodi povremeni bol u levoj nozi. Prethodno je učinjena biopsija navedene tumorske promene u drugoj ustanovi, a patohistoloski (PH) nalaz je išao u prilog ekstramamarnoj Pagetovoj bolesti. Pacijent je prezentovan konzilijumu IORS-a koji je doneo odluku o operativnom lečenju.

Urađena je ekscizija tumorske promene leve ingvinskrotalne regije uz primarno zatvaranje defekta. Dobijeni PH nalaz glasi: Imunohistohemijski profil tumorskih ćelija: CK7+, HER2+, CK5/6, HMB45-, p63-. U analiziranom preparatu je prisutan tumor koji po svojim histomorfološkim karakteristikama i imunohistohemijskim osobinama odgovara Pagetovoj bolesti sa invazijom svih slojeva derma, ali ne i potkožnog masnog tkiva, limfovaskularna invazija nije nađena. Bočne ivice resekcije su infiltrisane tumorskim tkivom, dok po dubini nisu infiltrisane, klasifikovan kao pT2.

Pacijent je postoperativno redovno kontrolisan. Nakon 4 meseca se javlja na kontrolni pregled kada su na UZ pregledu ingvinalne regije uočene dve lgl od 11 mm i 8 mm koje su suspektne i otvorene etiologije. Zatim je pacijent upućen na konzilijum koji je doneo odluku da se uradi MSCT.

INTRODUCTION

Extramammary Paget's disease (EMPD) is a rare intraepithelial malignancy that typically occurs in areas rich in apocrine glands, such as the perineum, vulva, axilla, scrotum, and penis [1]. The exact pathogenesis of EMPD is still not completely understood. Current data indicate that EMPD is a heterogenous disease that can be primary and secondary. Primary EMPD originates from the skin, more precisely from the epidermis or apocrine sweat glands. This form is initially limited to the epithelium but can progress to an invasive tumor that spreads to the dermis, as well as blood and lymphatic vessels. In advanced stages, it may lead to lymph node or visceral metastases. The secondary form of EMPD is associated with the spread of malignant adenocarcinoma cells originating from dermal adnexal glands or adjacent epithelium, typically from the genitourinary or gastrointestinal tract [2]. The incidence of extramammary Paget's disease is 6 per 1,000,000 people per year [3], with penoscrotal EMPD accounting for only 14% of all EMPD cases [4].

We present the case of an 81-year-old man with penoscrotal EMPD.

CASE

An 81-year-old man presented to the Institute of Oncology and Radiology of Serbia (IORS) on 9th February 2023 with a first-time complaint of an ulcerated, erythematous tumor measuring approximately 10 cm in diameter, covered with squamous plaques and extending from the left groin to the scrotum. The mass is erythematous and bloody, with occasional bleeding, and the patient reports occasional pain in the left leg. A biopsy of the tumor was previously performed at another institution, with the histopathology results indicating extramammary Paget's disease. The patient was presented to the IORS council, which recommended surgical treatment.

An excision of the tumor in the left inguinoscrotal region was performed, followed by primary closure of the defect. The histopathology report indicates the following immunohistochemical profile of the tumor cells: CK7+, HER2+, CK5/6+, HMB45-, p63-. The analyzed preparation reveals a tumor that, based on its histomorphological and immunohistochemical characteristics, is consistent with Paget's disease. The tumor invades all layers of the dermis but does not extend into the subcutaneous fat tissue, and no lymphovascular invasion was observed. The lateral edges of the resection are infiltrated with tumor tissue, but the infiltration does not extend to the depth, classified as pT2.

The patient was regularly monitored postoperatively. After 4 months, he returned for a follow-up ex-

Na učinjenom MSCT pregledu abdomena i male karlice verifikovane su multiple fokalne promene u jetri po tipu sekundarnih depozita. Retroperitonealno je prisutna limfadenopatija. Uočena je prostata izmenjenog oblika, izrazito nehomogena i neoštre konture, dimenzija 70 x 65 x 61 mm koja se utiskuje u mokraćnu bešiku, ali bez jasno očuvanog masnog plana ka desnoj semenoj vezikuli. Prikazane koštane strukture LS kičme su razređene, sa osteolitičnim, mrljastim i konfluentnim zonama uz izdvajanje korpusa L2 i L3 koji su smanjenog visinskog promera na terenu patološke frakture. Pacijent tada od tegoba navodi bolove u kostima, u desnoj i levoj prepони, kao i slabost donjih ekstremiteta 3 nedelje unazad.

Pacijent je ponovo prikazan konzilijumu IORS-a koji je uvidom u nalaz MSCT-a, tegobe koje navodi pacijent, kao i performans status pacijenta (PS3) doneo odluku da se u sklopu kompletne dijagnostičke obrade uradi PSA, CEA, CA19-9, pregled urologa, kolonoskopija, mamografija i MSCT toraksa.

Mamografski nalaz je bio uredan (BIRADS DD2 LD2). Tumorski markeri CEA 435,38 ng/mL; CA19-9 59 U/mL; PSA 4,41 ng/mL. Na učinjenom MSCT pregledu toraksa opisuje se jedan subpleuralni nodus u plućima sprema mediastinalno do 7 mm – sekundarni depozit granuloma i savetovano je dalje praćenje. Zbog teškog opšteg stanja pacijenta (PS4) pregled urologa i kolonoskopija nisu učinjeni.

Na **Slikama 1-5** vidi se histološki presek tumora sa ektramamarnom Pagetovom bolešću.

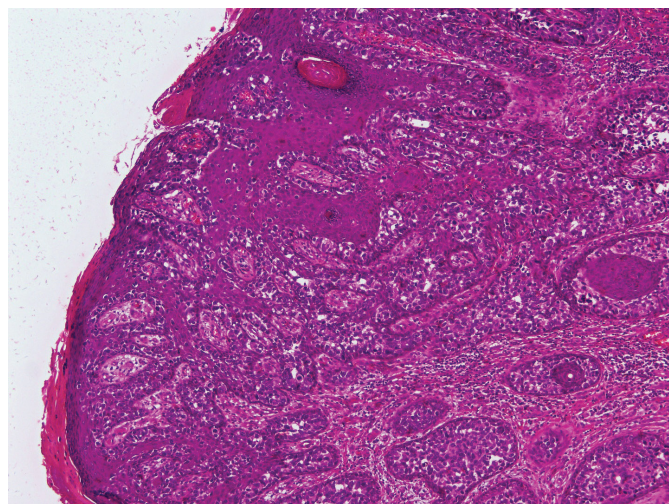
Pacijent je potom, ponovo prikazan konzilijumu, koji imajući u vidu opšte stanje pacijenta i raširenost bolesti, donosi odluku da specifično onkološko leče-

amination, during which an ultrasound of the inguinal region revealed two suspicious lesions, measuring 11 mm and 8 mm, with an indeterminate etiology. The patient was then referred to the council, which decided to proceed with a multidetector computed tomography (MDCT) scan.

The MDCT examination of the abdomen and pelvis revealed multiple focal lesions in the liver, consistent with secondary deposits. Lymphadenopathy was present retroperitoneally. An irregularly shaped prostate with extremely heterogeneous and indistinct contours, measuring 70 x 65 x 61 mm, was observed. It was compressing the urinary bladder and lacked a clearly defined fat plane adjacent to the right seminal vesicle. The bony structures of the lumbar spine showed rarefaction with osteolytic, patchy, and confluent areas. The L2 and L3 vertebral bodies were notably affected, exhibiting reduced height in the region of a pathological fracture. At that time, the patient reported bone pain in both the right and left groin, along with weakness in the lower extremities, which had persisted for 3 weeks.

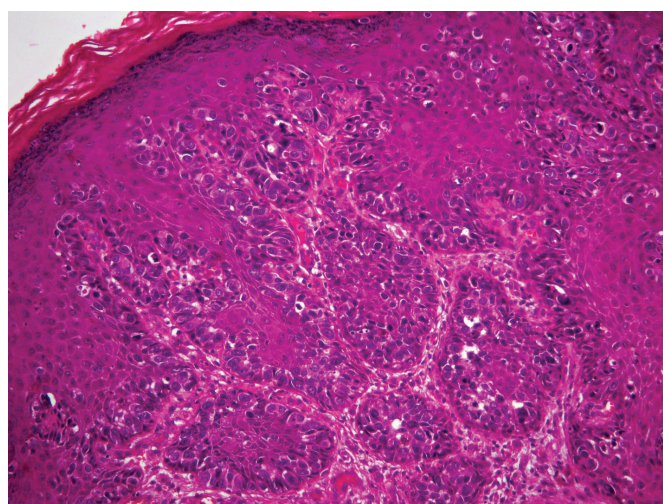
The patient was presented again to the IORS council, which, after reviewing the MDCT findings, the patient's reported symptoms, and his performance status (PS3), decided to conduct a comprehensive diagnostic work-up. This included PSA, CEA, and CA19-9 tests, a urological examination, colonoscopy, mammography, and MDCT of the thorax.

The mammographic findings were normal (BIRADS DD2 LD2). CEA tumor markers were as follows: CEA 435.38 ng/mL; CA19-9 59 U/mL; PSA 4.41 ng/mL. The MDCT examination of the thorax identified a subpleural



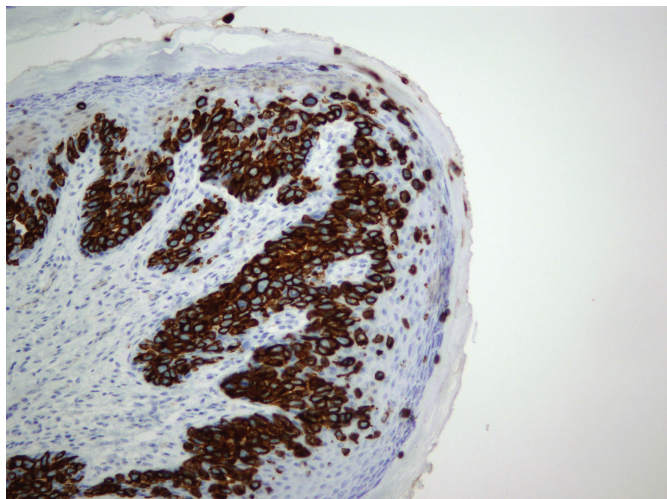
Slika 1. Ekstramamarna Pedžetova bolest. Neoplastične ćelije obilne citoplazme raspoređene u konfluentna gnezda i kao pojedinačne ćelije koje se šire kroz epiderm. (H&E, 10x)

Picture 1. Extramammary Paget's disease. Neoplastic cells with abundant cytoplasm are arranged in confluent nests and as single cells throughout the epidermis (H&E, 10x).



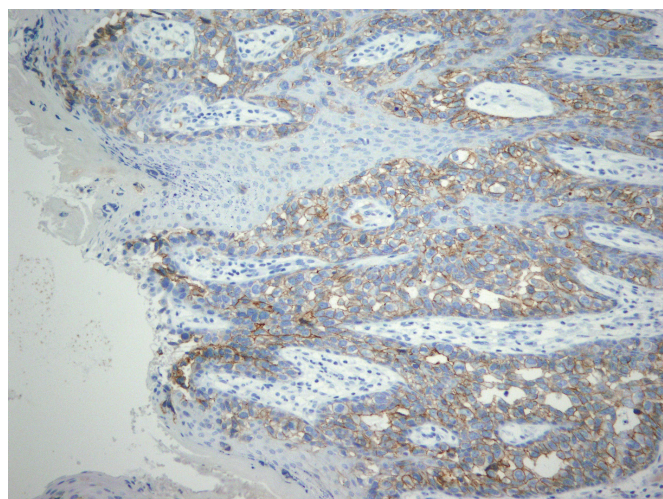
Slika 2. Ekstramamarna Pedžetova bolest. Klasteri i pojedinačne Pedžetove ćelije komprimuju bazalne keratinocite uz bazalnu membranu. (H&E, 20x)

Picture 2. Extramammary Paget's disease. The clusters and single Paget cells compress the basal keratinocytes against the basement membrane (H&E, 20x).



Slika 3. Ekstramamarna Pedžetova bolest. Neoplastične ćelije pokazuju citoplazmatsku i membransku pozitivnost na CK7. (CK7, 20x)

Picture 3. Extramammary Paget's disease. Neoplastic cells show cytoplasmic and membranous CK7 staining (CK7, 20x).



Slika 4. Ekstramamarna Pedžetova bolest. Neoplastične ćelije pokazuju umerenu membransku pozitivnost na HER2. (HER2, 20x)

Picture 4. Extramammary Paget's disease. Neoplastic cells show moderate, complete membranous staining for HER2 (HER2, 20x).

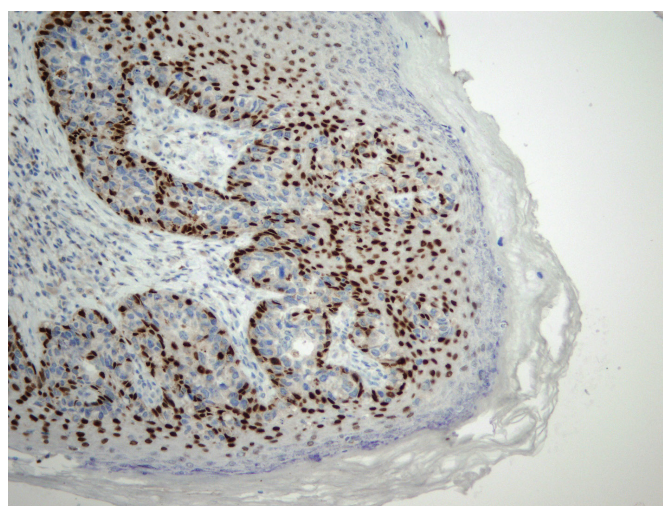
nje nije indikovano i da je u nastavku lečenja potrebno sprovesti simptomatsku i suportivnu terapiju.

Pacijent je zbog bolova u kostima, levoj i desnoj preponi, kao i slabosti donjih ekstremiteta pregledan u ambulanti za bol IORS-a gde je propisana simptomatska terapija: 1. Durogesic flaster 25 ugr/h, 2. Oramorph sirup 0,2%, 3. Fresubin 2 kcal, 4. Fortecortin tbl 4 mg, 5. Laktuloza sirup, 6. Klometol tbl.

DISKUSIJA

Sa istorijskog gledišta, Kroker je prvi opisao EMPB skrotuma i penisa 1889. godine [5]. Klinička manifestacija ove bolesti je kao nespecifični dobro ograničeni eritematozni, zadebljali ili beli ljuskavi plak nepravilnih granica [6,7]. EMPB moramo razlikovati od drugih oboljenja skvamoznog karcinoma, melanoma i benignih papuloskvamoznih bolesti. Penoskrotalne lezije se mogu javiti u preponama, a zatim se mogu proširiti na skrotum i penis. Lezije su najčešće praćene svrabom, ali se mogu javiti i peckanje i otok. Ingvinalna limfadenopatija može biti dijagnostikovana u nekim slučajevima i biti povezana sa edemom nogu [8].

Kao što je i u uvodu rečeno, EMPB je redak entitet, čija incidenca iznosi svega 6 / 1 000 000 osoba [3]. Vulva predstavlja najčešće mesto bolesti, kod oko 65% ukupno obolelih [9]. Za razliku od EMPB vulve, penoskrotalna EMPB se javlja znatno ređe. U Sjedinjenim Američkim Državama u periodu od 1973. do 2002. godine opisano je svega 100 slučajeva [10]. Makroskopski lezije izgledaju kao jasno ograničeni eritematozni plakovi, koji svrbe, mogu da ulcerišu i krvare. S obzirom na kliničku sliku često se pogrešno dijagnostikuje kao ekcem, lihen sklerozus, kontaktni dermatitis, seboreič-



Slika 5. Ekstramamarna Pedžetova bolest. Neoplastične ćelije su negativne na p63, dok ćelije epiderma pokazuju jedarnu imunopozitivnost na p63. (p63, 20x)

Picture 5. Extramammary Paget's disease. Neoplastic cells are negative for p63, whereas epidermal cells show nuclear p63 positivity (p63, 20x).

nodule in the lung, measuring up to 7 mm, located from the mediastinal region. This finding, which could represent a secondary deposit or granuloma, warranted further follow-up. Due to the patient's severe general condition (PS4), the urological examination and colonoscopy were not conducted.

Figures 1-5 display histological sections of a tumor diagnosed with extramammary Paget's disease.

The patient was reviewed by the council again, which, considering the patient's overall condition and disease progression, concluded that specific oncological treatment was not indicated. Instead, they recom-

ni dermatits, gljivična infekcija ili, najčešće, psorijaza, što često dovodi do odlaganja postavljanja prave dijagnoze, upućivanja pogrešnom specijalisti i pogrešne terapije [4,11]. Ukoliko lezije u regijama koje su bogate apokrinim žlezdama ne daju odgovor na prethodno ordiniranu terapiju, uvek u obzir treba uzeti EMPB [12].

U studiji naučnika sa Univerziteta Džon Hopkins u Baltimoru prosečna starost pacijenata sa penoskrotalnom EMPB je iznosila 73 godine (63-87) [13].

Da bi se postavila dijagnoza EMPB neophodan je patohistološki pregled biopsiranog materijala. Dijagnoza se potvrđuje prisustvom Pagetovih ćelija na rutinskom hematoksilin-eozin bojenju. Većina slučajeva EMPB predstavlja primarni adenokarcinom koji verovatno potiče od pluripotentnih ćelija iz bazalnog sloja epidermisa. Za razliku od primarne EMPB, sekundarna EMPB je povezana sa drugim anatomski bliskim malignitetima. Najveći broj maligniteta koji je povezan sa EMPB penisa i skrotuma jesu maligniteti genitourinarnog trakta (prostate i mokraćne bešike), kao i rektalni karcinom [14].

Prognoza lokalne EMPB je znatno bolja od invazivne, zato se i terapije razlikuju. U slučaju neinvazivne EMPB, terapija obuhvata nekoliko modaliteta lečenja: hiruršku resekciju, radioterapiju, topikalnu hemioterapiju, i fototerapiju. Najbolji vid terapije za neinvazivnu EMPB je svakako široka ekscizija lezije, a najveći broj autora preporučuje margine od 1 - 3cm u zdravo tkivo. S obzirom da se EMPB širi i van makroskopski uočljivih granica preporučuje se Mohsova mikrografska hirurgija koja ima niži stepen lokalnog recidiva bolesti (33% vs 23%). Disekcija pripadajućih limfnih nodusa je neophodna u slučaju njihovog zahvatanja. Profilaktička disekcija limfnih nodusa se ne preporučuje i nema nikakav benefit.

Kod pacijenata sa invazivnom EMPB hirurgija ne predstavlja kurativni tretman, pa je često adjuvantna hemio- i radioterapija neophodna. Citotoksični agensi 5-fluorouracil i Mitomicin C su efikasni kod neadekvatno ekscidiranih i uznapredovalih EMPB [15].

U studiji azijske grupe autora koja je obuhvatila ukupno 95 pacijenata lečenih od EMPB u periodu od 1993. do 2020. godine, petogodišnje preživljavanje pacijenata je iznosilo 79,3%, dok je ukupno desetogodišnje preživljavanje iznosilo 64,7%. Pacijenti sa sekundarnim oblikom EMPB, s obzirom na pridruženi drugi malignitet, su imali značajno kraće preživljavanje [16].

ZAKLJUČAK

Ekstramamarna Pagetova bolest predstavlja retku bolest koja zahvata kožu koja je bogata apokrinim žlezdama u regijama vulve, skrotuma, penisa i aksila. Pošto se bolest nalazi i izvan klinički vidljivih lezija pozitivne ivice resekcije su česte, a to predstavlja glavni faktor rizika za recidiv bolesti. Trenutno je terapija izbora ši-

mended continuing with symptomatic and supportive therapy.

Due to bone pain, pain in the left and right groin, and weakness in the lower extremities, the patient was evaluated at the IORS pain clinic. Symptomatic therapy was prescribed, including: 1. Durogesic patch 25 µg/h, 2. Oramorph syrup 0.2%, 3. Fresubin 2 kcal, 4. Fortecortin tablets 4 mg, 5. Lactulose syrup, and 6. Clometol tablets.

DISCUSSION

From a historical point of view, Crocker was the first to describe EMPD of the scrotum and penis in 1889 [5]. The clinical manifestation of this disease typically presents as a non-specific, well-demarcated erythematous plaque that may be thickened or covered with white, scaly patches, often with irregular borders [6,7]. EMPD must be differentiated from other conditions, including squamous cell carcinoma, melanoma, and benign papulosquamous diseases. Penoscrotal lesions may initially develop in the groin and subsequently spread to the scrotum and penis. Lesions are most often accompanied by itching, but burning and swelling may also occur. In some cases, inguinal lymphadenopathy may be diagnosed, which can be associated with leg edema [8].

As mentioned in the introduction, EMPD is a rare condition with an incidence of only 6 per 1,000,000 people [3]. The vulva is the most common site for the disease, affecting approximately 65% of patients [9]. Compared to vulvar EMPD, penoscrotal EMPD occurs much less frequently. In the period between 1973 and 2002, only 100 cases were presented in the United States of America [10]. Macroscopically, the lesions present as well-circumscribed erythematous plaques that may itch, ulcerate, and bleed. Due to its clinical presentation, the condition is often misdiagnosed as eczema, lichen sclerosus, contact dermatitis, seborrheic dermatitis, fungal infection, or, most commonly, psoriasis. This frequent misdiagnosis can result in delays in reaching the correct diagnosis, referrals to inappropriate specialists, and incorrect treatments [4,11]. If lesions in areas rich in apocrine glands do not respond to the previously prescribed therapy, EMPD should always be considered [12].

In a study conducted by scientists from Johns Hopkins University in Baltimore, the average age of patients with penoscrotal EMPD was 73 years, ranging from 63 to 87 [13].

A diagnosis of EMPD requires a histopathological examination of the biopsied tissue. The diagnosis is confirmed by the presence of Paget's cells on routine hematoxylin-eosin staining. Most cases of EMPD are

roka lokalna ekscizija lezije ili Mohsova mikrografska hirurgija. Raritet ovog entiteta čini istraživanja koja za cilj imaju lečenje ove bolesti izuzetno teškim. Potrebne su znatno veće studije koje bi nam dale dalje smernice kako pristupiti pacijentima sa EMPB.

Sukob interesa: Nije prijavljen.

LITERATURA / REFERENCES

1. Isrow D, Oregel KZ, Cortes J, Gomez H, Milikowski C, Feun L et al. Advanced Extramammary Paget's disease of the groin, penis, and scrotum. *Clin Med Insights Oncol.* 2014 Jul 6; 8:87-90. doi: 10.4137/CMO.S13107.
2. Kanitakis J. Mammary and extramammary Paget's disease. *J Eur Acad Dermatol Venereol.* 2007 May;21(5):581-90. doi: 10.1111/j.1468-3083.2007.02154.x.
3. Master VA, Herrel L, Johnson TV, Delman KA. Extramammary Paget's disease of the penis and anogenital area: SEER analysis. *J Clin Oncol.* 2011 Mar 1;29(7 Suppl): S220. doi:10.1200/jco.2011.29.7_suppl.220.
4. Ekwueme KC, Zakhour HD, Parr NJ. Extramammary Paget's disease of the penis: a case report and review of the literature. *J Med Case Rep.* 2009 Jan 6;3:4. doi: 10.1186/1752-1947-3-4.
5. Crocker HR. Paget's disease affecting the scrotum and penis. *Trans Pathol Soc Lond.* 1889; 40:187-91.
6. O'Connor EA, Hettinger PC, Neuburg M, Dzwierzynski WW. Extramammary Paget's disease: a novel approach to treatment using a modification of peripheral Mohs micrographic surgery. *Ann Plast Surg.* 2012 Jun;68(6):616-20. doi: 10.1097/SAP.0b013e31821b6c7b.
7. Badgwell C, Rosen T. Treatment of limited extent extramammary Paget's disease with 5 percent imiquimod cream. *Dermatol Online J.* 2006 Jan 27;12(1):22.
8. Hoch WH. Adenocarcinoma of the scrotum (extramammary Paget's disease): case report and review of the literature. *J Urol.* 1984 Jul;132(1):137-9. doi: 10.1016/s0022-5347(17)49501-2.
9. Siesling S, Elferink MA, van Dijk JA, Pierie JP, Blokx WA. Epidemiology and treatment of extramammary Paget disease in the Netherlands. *Eur J Surg Oncol.* 2007 Oct;33(8):951-5. doi: 10.1016/j.ejso.2006.11.028.
10. Wright JL, Morgan TM, Lin DW. Primary scrotal cancer: disease characteristics and increasing incidence. *Urology.* 2008 Nov;72(5):1139-43. doi: 10.1016/j.urology.2008.06.043.
11. Li YC, Lu LY, Yang YT, Chang CC, Chen LM. Extramammary Paget's disease of the scrotum associated with hepatocellular carcinoma. *J Chin Med Assoc.* 2009 Oct;72(10):542-6. doi: 10.1016/S1726-4901(09)70425-3.
12. Heymann WR. Extramammary Paget's disease. *Clin Dermatol.* 1993 Jan-Mar;11(1):83-7. doi: 10.1016/0738-081x(93)90101-h.
13. Shabihkhani M, Patil P, Murati Amador B, Plaza JA, Osunkoya AO, Lombardo KA et al. Extramammary Paget disease of the scrotum: a contemporary clinicopathologic analysis of 20 cases in the United States. *Appl Immunohistochem Mol Morphol.* 2020 Aug;28(7):524-31. doi: 10.1097/PAL.0000000000000789.
14. Payne WG, Wells KE. Extramammary Paget's disease of the scrotum. *Ann Plast Surg.* 1994 Dec;33(6):669-71. doi: 10.1097/0000637-199412000-00021.
15. Juang GD, Lin MY, Hwang TI. Extramammary Paget's disease of the scrotum. *J Chin Med Assoc.* 2011 Jul;74(7):325-8. doi: 10.1016/j.jcma.2011.05.010.
16. Ha DL, Ha GU, Kim JY, Han MH, Lee HJ, Hong DG et al. J. Five- and 10-year survival in extramammary Paget's disease: a focus on wide local excision. *Asia Pac J Clin Oncol.* 2023 May 3. doi: 10.1111/ajco.13964.

primary adenocarcinomas that probably originate from pluripotent cells in the basal layer of the epidermis. Unlike primary EMPB, secondary EMPB is associated with other anatomically close malignancies. The majority of malignancies associated with EMPD of the penis and scrotum are linked to genitourinary tract cancers, particularly prostate and bladder cancer, as well as rectal cancer [14].

The prognosis for localized EMPD is significantly better than for invasive disease, which is why the treatment approaches differ. For noninvasive EMPD, treatment options include surgical resection, radiotherapy, topical chemotherapy, and phototherapy. The most effective treatment for non-invasive EMPD is wide excision of the lesion, with most experts recommending margins of 1-3 cm in healthy tissue. Since EMPD often extends beyond macroscopically visible boundaries, Mohs micrographic surgery is recommended, as it offers a lower rate of local disease recurrence (23% vs 33%). Dissection of the associated lymph nodes is required if they are involved. Prophylactic lymph node dissection is not recommended, as it has no benefit.

In patients with invasive IMPB, surgery is not a curative treatment, so adjuvant chemotherapy and radiotherapy are often necessary. Cytotoxic agents such as 5-fluorouracil and Mitomycin C are effective for treating inadequately excised and advanced EMPD [15].

In a study conducted by an Asian research group involving 95 patients treated for EMPD between 1993 and 2020, the five-year survival rate was 79.3%, and the ten-year survival rate was 64.7%. Patients with secondary EMPD, due to the presence of an associated second malignancy, had a significantly shorter survival [16].

CONCLUSION

Extramammary Paget's disease is a rare condition that affects skin areas rich in apocrine glands, including the vulva, scrotum, penis, and axilla. Because the disease often extends beyond clinically visible lesions, positive resection margins are common, which is a major risk factor for disease recurrence. Currently, the preferred therapies are wide local excision of the lesion or Mohs micrographic surgery. The rarity of this condition makes research focused on developing effective treatments particularly challenging. Larger studies are needed to provide more guidance on how to approach and treat patients with EMPD.

Conflict of interest: None declared.

HIRURŠKO LEČENJE EVERZIJE VAGINE NAKON HISTEREKTOMIJE – PRIKAZ SLUČAJA I PREGLED LITERATURE

PRIKAZ SLUČAJA

CASE REPORT

INDIVIDUALIZED TREATMENT FOR POSTHYSTERECTOMY VAGINAL EVERSION – CASE REPORT AND LITERATURE REVIEW

Sveto Pantović^{1,2}, Jelena Dotlić^{1,2}, Katarina Stefanović^{1,2}, Branislav Milošević^{1,2},
Kosta Pantović¹, Ivana Likić Lađević^{1,2}

¹ Univerzitetski klinički centar Srbije, Klinika za ginekologiju i akušerstvo, Beograd, Srbija

² Univerzitet u Beogradu, Medicinski fakultet, Beograd, Srbija

¹ University Clinical Center of Serbia, Clinic for Gynecology and Obstetrics, Belgrade, Serbia

² University of Belgrade, Faculty of Medicine, Belgrade, Serbia

SAŽETAK

Uvod: Trenutno postoje različite preporuke za tretman vaginalne everzije. Prikazan slučaj pokazuje trenutne mogućnosti za lečenje potpune vaginalne everzije.

Prikaz slučaja: Pacijentkinja, starosti 61 godinu, imala je potpunu vaginalnu everziju, četvrtog stadijuma, sedamnaest godina nakon operacije – klasične abdominalne histerektomije sa bilateralnom adnektomijom. S obzirom na prolaps prednjeg vaginalnog zida, odlučeno je da se uradi prednja kolpoplastika i elevacija mokraćne bešike, u šavovima, po Keliju. Nikolsova bilateralna sakrospinalna fiksacija bila je tehnika izbora za korekciju rektokele/enetrokele i prolapsa zadnjeg zida vagine. Postoperativni tok protekao je bez komplikacija, a potpuno izlečenje vaginalne everzije potvrđeno je šestomesečnim pregledom.

Zaključak: Hirurško lečenje koje obuhvata prednju kolpoplastiku u kombinaciji sa bilateralnom fiksacijom sakrospinalnog ligamenta savetuje se za uznapredovalu fazu složenih vaginalnih everzija. Ova hirurška tehnika je efikasna i sigurna metoda lečenja.

Ključne reči: vaginalna everzija, histerektomija, prednja kolpoplastika, fiksacija sakrospinalnog ligamenta

ABSTRACT

Introduction: Currently, there are different recommendations for obtaining optimal treatment of vaginal eversion. The presented case highlights current options for individualized treatment of complete vaginal eversion.

Case report: A 61-year-old woman presented with complete vaginal eversion stage IV seventeen years after classic abdominal hysterectomy with bilateral adnexectomy. For anterior compartment prolapse, it was decided to perform anterior colpoplasty and bladder elevation using sutures, plication by Kelly. Nichols bilateral sacrospinal fixation was the chosen technique for correction of the rectocele/enterocele and prolapse of the posterior vaginal wall. The postoperative course was uneventful, and the resolution of vaginal eversion was confirmed on a six-month check-up.

Conclusions: The surgical repair incorporating anterior colpoplasty combined with bilateral sacrospinous ligament fixation is advised for the advanced stage of complex vaginal eversions. This treatment option is an effective and safe technique.

Keywords: vaginal eversion, hysterectomy, anterior colpoplasty, sacrospinous ligament fixation

Autor za korespondenciju:

Ivana Likić Lađević

Klinika za ginekologiju i akušerstvo, Univerzitetski klinički centar Srbije

Dr Koste Todorovića 26, 11000 Beograd, Srbija

Elektronska adresa: gyn.ladjevic@gmail.com

Corresponding author:

Ivana Likić Lađević

Clinic for Gynecology and Obstetrics, University Clinical Center of Serbia

26 Dr Koste Todorovića Street, 11000 Belgrade, Serbia

E-mail: gyn.ladjevic@gmail.com

Primljeno • Received: June 22, 2024; **Revidirano • Revised:** August 14, 2024; **Prihvaćeno • Accepted:** August 20, 2024; **Online first:** December 25, 2024

DOI: 10.5937/smdlk5-51819

UVOD

Potpuna vaginalna everzija (prolaps/svoda/kupole) predstavlja spuštanje apikalnog, odnosno gornjeg, srednjeg dela i donje trećine vagine iza introitusa. Everzija vaginalne manžetne može nastati kao posledica prethodne histerektomije, kako vaginalne, tako i abdominalne. Dodatni faktori rizika su urođena ili starosno zavisna insuficijencija mekog tkiva, defekt dna karlice, oštećenje karličnog dna nakon rođenja, težak fizički rad, neurološka oboljenja i gojaznost sa abdominopelvičnim disbalansom [1,2].

Sa starenjem ženske populacije, sve više pacijentkinja zahteva lečenje zbog prolapsa oba karlična organa. Prolaps vaginalnog svoda nakon histerektomije je česta komplikacija (0,2% do čak 36%) i može izazvati značajnu nelagodnost kod pacijentkinja kao što su bol, svrab, vaginalna erozija i probleme sa zadržavanjem urina i stolice. Štaviše, čini se da stope vaginalne everzije nakon histerektomije pokazuju vezu sa indikacijama za histerektomiju (1,6% nakon histerektomije zbog prolapsa i 1,8% zbog drugih patologija) [1,3].

Dostupni su različiti tretmani (konzervativni i hirurški), ali ne postoje jasne smernice koje preporučuju koji je pristup najbolji. Konzervativni ili mehanički tretmani se razmatraju kod žena sa blagim stepenom prolapsa ili kod onih koje ne žele ili ne mogu da se podvrgnu operaciji zbog različitih kontraindikacija. Hirurška intervencija je često neophodna kada konzervativni tretman nije uspešan. Hiruršku tehniku treba prilagoditi svakom pacijentu na osnovu anatomije, starosti, komorbiditeta i drugih faktora. Ipak, sve hirurške metode, bez obzira na njihov pristup (vaginalni, abdominalni otvoreni ili laparoskopski), imaju za cilj resuspendovanje vaginalnog vrha (nativnim tkivom ili sintetičkim materijalom) do čvrstih karličnih struktura koje mogu omogućiti njegovu dalju podršku (sakrum ili sakrospinalni ligamenti) [4,5].

Ovaj slučaj pokazuje dostupne opcije za lečenje vaginalne everzije kod pojedinačne pacijentkinje.

PRIKAZ SLUČAJA

Žena stara 61 godina upućena je u našu ustanovu zbog potpune vaginalne everzije. Pacijentkinja je pre 17 godina bila podvrgnuta klasičnoj abdominalnoj histerektomiji sa bilateralnom adnektomijom zbog značajnog mioma materice. Pacijentkinja nije imala ginekološke tegobe 12 godina, nakon čega je počela da primećuje malu izbočinu koja viri iz vaginalnog introitusa tokom fizičke aktivnosti. Izbočina se vremenom povećavala, a stanje je napredovalo sa značajnom nelagodnošću i poteškoćama pri početku mokrenja, ali bez urinarne inkontinencije. Pacijentkinja nije imala vaginalno krvarenje, bol u stomaku i/ili karlici, ali je

INTRODUCTION

Complete vaginal eversion (cuff/vault/dome prolapse) represents a descent of the apical, i.e., upper, midportion, and lower third of the vagina beyond the introitus. Vaginal cuff eversion can occur as a consequence of prior hysterectomy, both vaginal and abdominal. Additional risk factors are congenital or age-dependent insufficiency of soft tissue, pelvic floor defect, damage of the pelvic floor after birth, heavy physical work, neurological illnesses, and obesity with abdominopelvic imbalance [1,2].

With the aging of the female population, more patients require treatment for both pelvic organ prolapse. Vaginal vault prolapse following hysterectomy is a common complication (0.2% to even 36%) and can cause significant discomfort for patients as pain, itching, vaginal erosion, and issues with urinary and stool retention. Moreover, it seems that rates of posthysterectomy vaginal eversion show a relationship with indications for hysterectomy (1.6% following hysterectomy for prolapse and 1.8% for other pathologies) [1,3].

Various treatments are available (conservative and surgical), and there are no clear guidelines to recommend which is the best. Conservative or mechanical treatments are considered for women with a mild degree of prolapse or those who are unwilling or unable to undergo surgery due to different contraindications. Surgical intervention is often necessary when conservative treatment does not succeed. The surgical technique should be adapted to each patient based on anatomy, age, comorbidity, and other factors. Still, all surgical methods, regardless of their approach (vaginal, abdominal open, or laparoscopic), aim at resuspending the vaginal apex (with native tissue or by synthetic material) to firm pelvic structures that can enable its further support (sacrum or sacrospinous ligaments) [4,5].

This case shows the available options for the treatment of vaginal eversion in the individual patient.

CASE REPORT

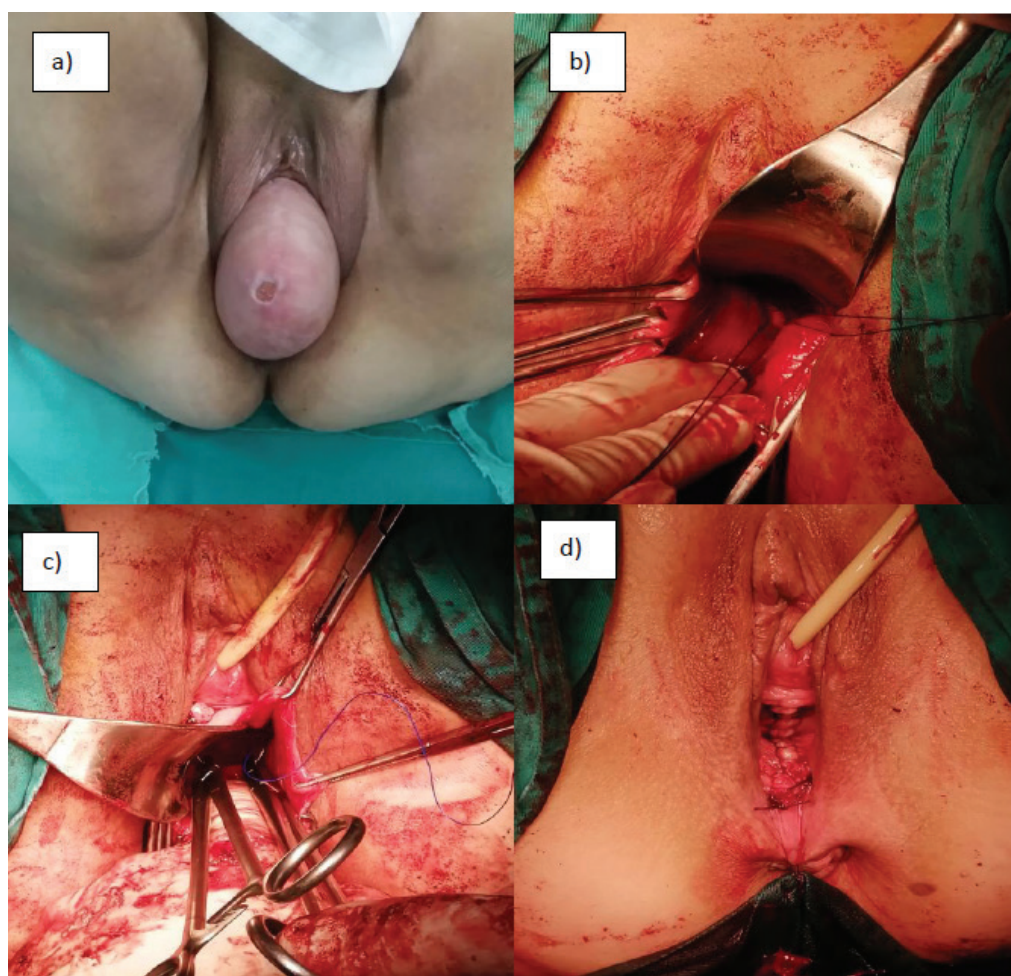
A 61-year-old woman was referred to our institution because of complete vaginal eversion. The patient had undergone a classic abdominal hysterectomy with bilateral adnexectomy 17 years ago due to a sizeable uterine myoma. The patient had no gynecological complaints for 12 years, after which she started noticing that during physical activity, a small bulge was slightly protruding from the vaginal introitus. The protuberance increased over time, and the condition progressed with significant discomfort and difficulties in voiding commencement but without urinary incontinence. The patient declined any vaginal bleeding,

imala eroziju vagine, poteškoće sa defekacijom i zadržavanje urina. Pacijentkinja je imala hroničnu hipertenziju, dijabetes melitus tip II i gojaznost (indeks telesne mase 34,53 kg/m²). Bila je zainteresovana za održavanje seksualne funkcije.

Tokom fizikalnog pregleda po prijemu u našu ustanovu, primenom Sistema za kvantifikaciju prolapsa karličnih organa, identifikovan je prolaps vaginalnog svoda IV stadijuma, sa dekubitalnim promenama na sluzokoži. Iako nije bilo prisutne stresne urinarne inkontinencije, postvoidni rezidualni urin izmeren je na 57 ml tokom kateterizacije. Zbog toga je indikovana operativna intervencija. Odlučeno je da se prolaps prednjeg kompartmenta koriguje prednjom kolpoplastikom i elevacijom mokraćne bešike, dok je Nicholasova bilateralna sakrospinozna fiksacija izabrana kao tehnika za korekciju rektokele/enterokele i prolapsa zadnjeg zida vagine. Pre operacije uzeta je detaljna medicinska i ginekološka anamneza, i obavljene su standardne laboratorijske i mikrobiološke analize. Ultrazvučni pregled karlice i abdomena nije pokazao patološke nalaze.

abdominal and/or pelvic pain but had vaginal erosion, defecation difficulties, and urinary retention. The patient had chronic hypertension, diabetes mellitus type II, and obesity (Body Mass Index 34.53 kg/m²). She was interested in maintaining sexual function.

During the physical examination upon admission to our institution, a stage IV vaginal vault prolapse was identified using the Pelvic Organ Prolapse Quantification System, with decubital changes on the mucosa. Although stress urinary incontinence wasn't present, postvoid residual urine was measured at 57 ml during catheterization. Thus, operative treatment was indicated. It was decided to correct the anterior compartment prolapse with anterior colpoplasty and bladder elevation, while Nichols's bilateral sacrospinous fixation was the chosen technique for correction of the rectocele/enterocele and prolapse of the posterior vaginal wall. Before surgery, detailed medical and gynecological history and standard laboratory and microbiological analyses were taken. An ultrasonographic scan of the pelvis and abdomen showed no pathological findings.



Slika 1. (a) Preoperativno stanje, desna (b) i leva (c) sakrospinalna fiksacija, (d) nakon operacije

Picture 1. (a) Preoperative status, (right b, left c) sacrospinous fixation, (d) final result

Nakon primene opšte anestezije, pacijentkinja je postavljena u litotomiju i aseptički pripremljena. Postavljen je uretralni kateter. Vaginalni vrh je identifikovan i povučen nadole. Na prednjoj strani, napravljen je vertikalni srednji rez, približno jedan centimetar od uretralnog meatusa do vrha vagine. Koristeći oštru i tupu disekciju, bešika i creva su odvojeni od zida vagine. Poprečni šavovi su postavljeni na vezikovaginalnu fasciju kako bi se podigla i podržala bešika. Višak sluzokože vagine je odstranjen, a prednji zid vagine je zašiven. Nakon toga, napravljen je vertikalni srednji rez od vrha vagine do perineuma pozadi. Urađena je pararektalna tupa disekcija prema ishijalnoj kičmi, prvenstveno na desnoj, a zatim na levoj strani. Sakrospinozni ligament je digitalno i vizuelno identifikovan. Kod Breiski-Navratila, retraktor rektuma je pomeren medijalno, čime je omogućena vizualizacija ligamenta. Koristeći dugu ravnu iglu, jedan resorptivni i jedan neresorptivni šav postavljeni su kroz sakrospinozni ligament na desnoj i levoj strani, otprilike 2 do 3 cm medijalno od ishijalne kičme, i fiksirani za vaginalni vrh. Vaginalni prolaps je repositioniran u karlicu tako što su četiri šava pričvršćena šavom Pullei. Višak sluzokože vagine je odstranjen, a zadnji zid vagine je zašiven.

Nakon operacije, vagina je zadržala dužinu od 7 cm. Prvog dana nakon operacije, kateter je uklonjen, a pacijentkinja je mogla spontano da isprazni bešiku. Opuštena je trećeg postoperativnog dana u stabilnom stanju. Postoperativni oporavak je protekao bez komplikacija, a razrešenje vaginalne everzije potvrđeno je šestomesečnim pregledom. Praćenje pacijentkinje se nastavlja.

DISKUSIJA

Genitalni organi se održavaju u karličnoj šupljini uglavnom uz pomoć endopelvične fascije (uključujući vezikovaginalnu fasciju, rektovaginalni septum, sakrouterini ligament i kardinalni ligament) i karlične dijafragme (koja se sastoji od mišića levator ani) [1,6]. Apikalni prolaps, praćen prolapsom oba zida, odnosno kompartmenta, javlja se u 67% slučajeva i naziva se složena vaginalna everzija. Kompleksne everzije se sastoje od apikalnog prolapsa sa cistocelom u 7%, rektokele u 30% i cistocele i rektokele u 30% slučajeva. Potpuna vaginalna everzija ili složena everzija do tačke niže od 2 cm ukupne vaginalne dužine klasifikovana je kao faza IV u sistemu kvantifikacije prolapsa karličnih organa [1,6]. To je bio slučaj sa našom pacijentkinjom.

Vaginalna everzija, odnosno prolaps svoda nakon abdominalne ili vaginalne histerektomije, jedan je od najizazovnijih stanja u rekonstrukciji karlice i obično zahteva kombinovane hirurške tehnike, kao i upotrebu sintetičkih materijala. Druge metode lečenja, lekovi i vežbe za jačanje mišića karličnog dna, pokazale su

Following the administration of general anesthesia, the patient was positioned in lithotomy and prepared aseptically. A urethral catheter was placed. The vaginal apex was identified and pulled downwards. Anteriorly, the vertical midline incision was made approximately one centimeter from the urethral meatus to the vaginal apex. Using sharp and blunt dissection, the bladder and intestines were detached from the vaginal wall. Transverse sutures were placed on the vesicovaginal fascia to elevate and support the bladder. Excess vaginal mucosa was cut off, and the anterior vaginal wall was sutured. Afterward, the vertical midline incision was made from the vaginal apex to the perineum posteriorly. Pararectal, blunt dissection was made toward the ischial spine, primarily on the right and then on the left side. The sacrospinous ligament was digitally and visually identified. With Breisky-Navratil, the retractor rectum was displaced medially, and the visualization of the ligament was enabled. Using a long straight needle, one resorptive and one nonresorptive suture was placed through the sacrospinous ligament on the right and left side, approximately 2 to 3 cm medial to the ischial spine, and fixed to the vaginal apex. The vaginal prolapse was repositioned into the pelvis by securing the four sutures with a Pulley stitch. Excess vaginal mucosa was cut off, and the posterior vaginal wall was sutured.

After the surgery, the vagina maintained a length of 7 cm. On the first day after surgery, the catheter was removed, and the patient was able to empty her bladder spontaneously. She was discharged on the third postoperative day in a stable condition. The postoperative recovery lasted without any complications, and the resolution of vaginal eversion was confirmed on a six-month check-up. Patient follow-up continues.

DISCUSSION

The genital organs are maintained in the pelvic cavity mainly by the support of the endopelvic fascia (including the vesicovaginal fascia, rectovaginal septum, sacrouterine ligament, and cardinal ligament) and the pelvic diaphragm (which comprises the levator ani muscles) [1,6]. The apical prolapse accompanied by the prolapse of both walls, i.e., compartments, occurs in 67% of cases and is referred to as complex vaginal eversion. Complex eversions consist of apical prolapse with cystocele in 7%, rectocele in 30%, and both cystocele and rectocele in 30% of cases. Complete vaginal eversion or complex eversion to the point lower than 2 cm of the total vaginal length is classified as stage IV in the Pelvic Organ Prolapse Quantification system [1,6]. This was the case for our patient.

Vaginal eversion, i.e., vault prolapse after abdominal or vaginal hysterectomy, is one of the most challenging

se neadekvatnim i ne rešavaju problem u potpunosti. Iako se često koristi abdominalni (ponekad otvoreni, a češće laparoskopski) pristup, vaginalni operativni pristup se generalno smatra optimalnim za korekciju svih tri kompartmentalna defekta karličnog dna [3-5].

U literaturi su opisane prednosti upotrebe sintetičkih materijala za korekciju prolapsa prednjeg zida vagine. Sintetički materijali pružaju izdržljivu dugotrajnu podršku za zidove i vrh vagine. Podaci iz literature ukazuju na to da često korišćeni setovi mreže imaju prilično visoke (do 95%) stope uspeha za korekciju vaginalne everzije nakon jednogodišnjeg praćenja. Štaviše, primena polipropilenske mreže je minimalno invazivna, sa brzim postoperativnim oporavkom i značajno smanjenom stopom morbiditeta u poređenju sa otvorenim ili laparoskopskim pristupom [7-9].

Međutim, poslednjih godina objavljuje se sve veći broj upozorenja o bezbednosti upotrebe sintetičkog vaginalnog materijala (retke, ali ozbiljne komplikacije kao što su infekcije, duboka fascijalna nekroza, fistule i dispareunija). Najistaknutija komplikacija je ekstruzija mreže (4 do 20%), posebno kod starijih žena čije se vaginalno tkivo i ligamentna potpora vremenom dodatno smanjuju. Ekstruzija mreže može dovesti do oštećenja susednih organa i stoga zahteva ponovnu intervenciju [10]. Zbog ovih ozbiljnih komplikacija koje su prijavljene, setovi mreže u nekim zemljama su reklasifikovani u visokorizične medicinske uređaje, a njihova upotreba je čak i ukinuta. Stoga, transvaginalnu primenu bilo kog tipa mreže treba izvoditi samo u složenim slučajevima praćenim teškom urinarnom inkontinencijom, gde korist opravdava priznati rizik. Shodno tome, operacije popravke nativnog tkiva ponovo su privukle pažnju u rekonstrukciji karlice [11,12].

Vagina se može uspešno vratiti u svoj anatomske položaj zadnjeg nagiba fiksacijom sakrospinoznog ligamenta bez implantacije bilo kakvog veštačkog materijala. Još jedna prednost je očuvanje vaginalne dužine i, posledično, koitalne funkcije [4,13]. Ova procedura se izvodi vaginalno, za kratko vreme i uz minimalan gubitak krvi, što je čini bezbednom i efikasnom tehnikom. Dokazano je da sakrospinozna fiksacija daje dobre dugoročne objektivne ishode, kao i poboljšan kvalitet života sa manje komplikacija od mesh aplikacije. Podaci iz literature ukazuju na značajno poboljšanje svih simptoma kod više od 90% pacijenata. Štaviše, utvrđeno je da ova vrsta operacije ima manji rizik od ponovnog prolapsa, ponovljene operacije zbog prolapsa, postoperativne stresne urinarne inkontinencije i dispareunije u odnosu na druge vaginalne operacije [5,14]. Fiksacija sakrospinoznog ligamenta se izvodi jednostrano ili bilateralno, tradicionalno koristeći tehnike zadnje, a povremeno i prednje disekcije. Utvrđeno

je da se u uslojima pelvične rekonstrukcije, a ono što obično zahteva kombinaciju hirurških tehnika kao i upotrebu sintetičkih materijala. Ostale metode, medicinske, fizičke i vežbe za jačanje mišića dna pelvisu pokazale su se neadekvatnim i ne rešavaju problem u potpunosti. Iako se često koristi abdominalni (ponekad otvoreni, a češće laparoskopski) pristup, vaginalni operativni pristup se generalno smatra optimalnim za korekciju svih tri kompartmentalna defekta karličnog dna [3-5].

Literatura opisuje prednosti upotrebe sintetičkih materijala za korekciju prolapsa prednjeg zida vagine. Sintetički materijali pružaju izdržljivu dugotrajnu podršku za zidove i vrh vagine. Podaci iz literature ukazuju na to da često korišćeni setovi mreže imaju prilično visoke (do 95%) stope uspeha za korekciju vaginalne everzije nakon jednogodišnjeg praćenja. Štaviše, primena polipropilenske mreže je minimalno invazivna, sa brzim postoperativnim oporavkom i značajno smanjenom stopom morbiditeta u poređenju sa otvorenim ili laparoskopskim pristupom [7-9].

Međutim, poslednjih godina objavljuje se sve veći broj upozorenja o bezbednosti upotrebe sintetičkog vaginalnog materijala (retke, ali ozbiljne komplikacije kao što su infekcije, duboka fascijalna nekroza, fistule i dispareunija). Najistaknutija komplikacija je ekstruzija mreže (4 do 20%), posebno kod starijih žena čije se vaginalno tkivo i ligamentna potpora vremenom dodatno smanjuju. Ekstruzija mreže može dovesti do oštećenja susednih organa i stoga zahteva ponovnu intervenciju [10]. Zbog ovih ozbiljnih komplikacija koje su prijavljene, setovi mreže u nekim zemljama su reklasifikovani u visokorizične medicinske uređaje, a njihova upotreba je čak i ukinuta. Stoga, transvaginalnu primenu bilo kog tipa mreže treba izvoditi samo u složenim slučajevima praćenim teškom urinarnom inkontinencijom, gde korist opravdava priznati rizik. Shodno tome, operacije popravke nativnog tkiva ponovo su privukle pažnju u rekonstrukciji karlice [11,12].

Vagina se može uspešno vratiti u svoj anatomske položaj zadnjeg nagiba fiksacijom sakrospinoznog ligamenta bez implantacije bilo kakvog veštačkog materijala. Još jedna prednost je očuvanje vaginalne dužine i, posledično, koitalne funkcije [4,13]. Ova procedura se izvodi vaginalno, za kratko vreme i uz minimalan gubitak krvi, što je čini bezbednom i efikasnom tehnikom. Dokazano je da sakrospinozna fiksacija daje dobre dugoročne objektivne ishode, kao i poboljšan kvalitet života sa manje komplikacija od mesh aplikacije. Podaci iz literature ukazuju na značajno poboljšanje svih simptoma kod više od 90% pacijenata. Štaviše, utvrđeno je da ova vrsta operacije ima manji rizik od ponovnog prolapsa, ponovljene operacije zbog prolapsa, postoperativne stresne urinarne inkontinencije i dispareunije u odnosu na druge vaginalne operacije [5,14]. Fiksacija sakrospinoznog ligamenta se izvodi jednostrano ili bilateralno, tradicionalno koristeći tehnike zadnje, a povremeno i prednje disekcije. Utvrđeno

no je da bilateralna tehnika omogućava bolji kvalitet života od unilateralne fiksacije jer se čini da smanjuje dispareuniju i simptome creva uzrokovane devijacijom vaginalne ose na jednu stranu do kojih može doći u slučaju jednostrane fiksacije [15,16]. Kod prikazane pacijentkinje urađena je bilateralna fiksacija sakrospinoznog ligamenta, koja se pokazala uspešnom, bez komplikacij, sa povoljnim ishodom šest meseci nakon operacije.

Najznačajnije komplikacije povezane sa fiksacijom sakrospinoznog ligamenta uključuju vaskularne povrede i krvarenje (približno 5%), oštećenje rektuma (0,5%), povredu pudendalnog ili išijadičnog nerva (do 2%) i hronični bol (2%). Pored toga, rekurentni prolaps vaginalnog svoda može se pojaviti u do 19% slučajeva nakon procedure. Nakon fiksacije sakrospinoznog ligamenta, rekurentni defekti najčešće nastaju u prednjem odeljku zbog postoperativne vaginalne retroverzije, zbog čega je prednji vagini zid više izložen abdominalnom pritisku, ali su takođe prijavljeni rekurentni rektokele i uretralni sindrom [13]. Zbog toga se, u cilju sprečavanja recidiva, predlaže istovremeni tretman prednjeg zida sa svakom kolpopeksijom, kao što smo prikazali u ovom izveštaju. Ipak, iskustvo i dobra operativna tehnika, uz odgovarajuće indikacije i selekciju pacijenata, uglavnom smanjuju komplikacije i učestalost recidiva [17].

Transperitonealni pristup sa uterosakralnom suspenzijom, danas obično laparoskopijom, opisali su Shull i saradnici, sa 88,2% uspešnih suspenzija, ali je bio povezan sa rizikom od okluzije uretera do 11% [18].

Alternativne manje transvaginalne operacije su obliterativne procedure (kolpokleiza). Međutim, nakon ovih procedura, postoji veći rizik od stresne urinarnе inkontinencije, poteškoća u dijagnostici maligniteta materice i gubitka seksualne funkcije. Abdominalna sakralna kolpopeksija, otvorena ili laparoscopska, takođe se može izvesti u nekim slučajevima. Ipak, vaginalni pristup je često bolji jer omogućava i popravku karličnog dna, dok se mogu izbeći potencijalne komplikacije povezane sa opštom anestezijom, laparotomijom ili laparoskopijom, što je posebno važno za starije pacijentkinje koje su često medicinski kompromitovani [4,5,13].

Konačno, može se zaključiti da je hirurška sanacija posthisterektomske vaginalne everzije primenom bilateralne fiksacije sakrospinoznog ligamenta efikasna i sigurna, čak i za najnaprednije stadijume vaginalne everzije.

Sukob interesa: Nije prijavljen.

for prolapse, postoperative urinary stress incontinence, and dyspareunia than other vaginal operations [5,14]. Sacrospinous ligament fixation is performed unilaterally or bilaterally, traditionally using the posterior and occasionally anterior dissection techniques. The bilateral technique was found to enable a better quality of life than unilateral fixation as it seems to reduce dyspareunia and bowel symptoms caused by deviation of the vaginal axis to one side that might occur in the case of unilateral fixation [15,16]. As for the presented patient, bilateral sacrospinous ligament fixation was performed, and it proved to have no complications and a favorable outcome six months after the operation.

The most significant complications associated with sacrospinous ligament fixation include vascular injury and hemorrhage (approximately 5%), rectal damage (0.5%), pudendal or sciatic nerve injury (up to 2%), and chronic pain (2%). Additionally, recurrent vaginal vault prolapse may occur in up to 19% of cases after the procedure. After sacrospinous ligament fixation, recurrent defects most commonly arise in the anterior compartment due to the postoperative vaginal retroversion making the anterior vaginal more exposed to abdominal pressure, but recurrent rectoceles and urethral syndrome have also been reported [13]. Therefore, in order to prevent recurrence, simultaneous treatment of the anterior wall is suggested with every colpopexy, as we presented in this case report. Still, experience and good operative technique, along with appropriate indications and selection of patients, mainly reduce complications and incidence of recurrences [17].

The transperitoneal approach with uterosacral suspension, usually by laparoscopy today, was described by Shull et al., with 88.2% successful suspensions, but it was associated with a risk of ureteral occlusion of up to 11% [18].

Alternative minor transvaginal operations are obliterative procedures (colpocleisis). However, following these procedures, there is a higher risk of stress urinary incontinence, difficulties in diagnosing uterine malignancy, and loss of sexual function. Abdominal sacral colpopexy, either open or laparoscopic, can also be performed in some cases. Nevertheless, the vaginal approach is always better, as it also enables the repair of the pelvic floor while potential complications associated with general anesthesia, laparotomy, or laparoscopy can be avoided, which is particularly important for elderly patients who are often medically compromised [4,5,13].

Finally, it can be concluded that surgical repair of posthysterectomy vaginal eversion using bilateral sacrospinous ligament fixation is both effective and safe, even for the most advanced stages of vaginal eversion.

Conflict of interest: None declared.

LITERATURA / REFERENCES

- Kayondo M, Geissbühler V, Migisha R, Kajabwangu R, Njagi J, Kato PK, et al. Risk factors for recurrence of pelvic organ prolapse after vaginal surgery among Ugandan women: a prospective cohort study. *Int Urogynecol J*. 2022 Jul;33(7):1933-9. doi: 10.1007/s00192-021-04930-8.
- Brunes M, Ek M, Drca A, Söderberg M, Bergman I, Warnqvist A, et al. Vaginal vault prolapse and recurrent surgery: A nationwide observational cohort study. *Acta Obstet Gynecol Scand*. 2022 May;101(5):542-9. doi: 10.1111/aogs.14341.
- Robinson D, Thiagamoorthy G, Cardozo L. Post-hysterectomy vaginal vault prolapse. *Maturitas*. 2018 Jan; 107:39-43. doi: 10.1016/j.maturitas.2017.07.011.
- Lua-Mailland LL, Wallace SL, Khan FA, Kannikal JJ, Israeli JM, Syan R. Review of vaginal approaches to apical prolapse repair. *Curr Urol Rep*. 2022 Dec;23(12):335-44. doi: 10.1007/s11934-022-01124-7.
- Lallemant M, Grob ATM, Puyraveau M, Perik MAG, Alhafidh AHH, Cosson M, et al. Comparison of first versus second line sacrocolpopexies in terms of morbidity and mid-term efficacy. *Sci Rep*. 2022 Sep 29;12(1):16283. doi: 10.1038/s41598-022-20127-5.
- Weintraub AY, Gliner H, Marcus-Braun N. Narrative review of the epidemiology, diagnosis and pathophysiology of pelvic organ prolapse. *Int Braz J Urol*. 2020 Jan-Feb;46(1):5-14. doi: 10.1590/S1677-5538.IBJU.2018.0581.
- Wang X, Chen Y, Hu C, Hua K. Long-term outcomes of transvaginal mesh surgery for pelvic organ prolapse: a retrospective cohort study. *BMC Womens Health*. 2021 Oct 11;21(1):362. doi: 10.1186/s12905-021-01505-z.
- Sun MJ, Chuang YL, Lau HH, Lo TS, Su TH. The efficacy and complications of using transvaginal mesh to treat pelvic organ prolapse in Taiwan: A 10-year review. *Taiwan J Obstet Gynecol*. 2021 Mar;60(2):187-92. doi: 10.1016/j.tjog.2021.01.031.
- Marcu D, Diaconu C, Iorga L, Bratu O, Mischianu D. Mesh colposacropexy in the management of anterior vaginal compartment prolapse. *J Med Life*. 2019 Jan-Mar;12(1):65-70. doi: 10.25122/jml-2019-0018.
- Deblaere S, Hauspy J, Hansen K. Mesh exposure following minimally invasive sacrocolpopexy: a narrative review. *Int Urogynecol J*. 2022 Oct;33(10):2713-25. doi: 10.1007/s00192-021-04998-2.
- Wyndaele M, Madhu C, Hashim H. Female stress urinary incontinence surgery: 'Resurgence of the Titans'. *Turk J Urol*. 2021 May;47(3):210-5. doi: 10.5152/tud.2021.21073.
- Ugianskiene A, Davila GW, Su TH; FIGO Urogynecology and Pelvic Floor Committee. FIGO review of statements on use of synthetic mesh for pelvic organ prolapse and stress urinary incontinence. *Int J Gynaecol Obstet*. 2019 Nov;147(2):147-55. doi: 10.1002/ijgo.12932.
- Leron E, Erez O, Shwarzam P, Baessler K. Sacrospinous ligament fixation (SSLF): an old method with new horizons. *Arch Gynecol Obstet*. 2022 Jun;305(6):1379-82. doi: 10.1007/s00404-022-06508-1.
- Palmerola R, Rosenblum N. prolapse repair using non-synthetic material: what is the current standard? *Curr Urol Rep*. 2019 Oct 14;20(11):70. doi: 10.1007/s11934-019-0939-8.
- Campbell J, Pedroletti C, Ekhed L, Nüssler E, Strandell A. Patient-reported outcomes after sacrospinous fixation of vault prolapse with a suturing device: a retrospective national cohort study. *Int Urogynecol J*. 2018 Jun;29(6):821-9. doi: 10.1007/s00192-017-3491-4.
- Vitale SG, Laganà AS, Noventa M, Giampaolino P, Zizolfi B, Buttice S, et al. Transvaginal bilateral sacrospinous fixation after second recurrence of vaginal vault prolapse: efficacy and impact on quality of life and sexuality. *Biomed Res Int*. 2018 Feb 28;2018:5727165. doi: 10.1155/2018/5727165.
- Lallemant M, Giraudet G, Delporte V, Behal H, Rubod C, Delplanque S, et al. Long-term assessment of pelvic organ prolapse reoperation risk in obese women: vaginal and laparoscopic approaches. *J Clin Med*. 2022 Nov 21;11(22):6867. doi: 10.3390/jcm11226867.
- Ow LL, Walsh CE, Rajamaheswari N, Dwyer PL. Technique of extraperitoneal uterosacral ligament suspension for apical suspension. *Int Urogynecol J*. 2016 Apr;27(4):637-9. doi: 10.1007/s00192-015-2873-8.

ZAHVALNICA RECENZENTIMA

Urednici Srpskog medicinskog časopisa Lekarske komore izražavaju iskrenu zahvalnost za izuzetnu pomoć u proceni naučne vrednosti rukopisa sledećim recenzentima angažovanim u 2024. godini:

1. Agić Danijela
2. Antonijević Nebojša
3. Arandjelović Snežana
4. Atanasković Lavinika
5. Barać Branko
6. Begović-Kuprešanin Vesna
7. Bila Jelena
8. Bogdanović Radovan
9. Cijan Vladimir
10. Cilović-Lagarija Šeila
11. Cvetković Zorica
12. Čokić Vladan
13. Čojbašić Irena
14. Dugalić Stefan
15. Dunjić-Kostić Bojana
16. Đorđević Olivera
17. Đunić Irena
18. Đurić Olivera
19. Elez Marija
20. Ercegovac Maja
21. Filipović Gordana
22. Galun Danijel
23. Gojnić Miroslava
24. Govedarović Nenad
25. Herrera Doris Elena
26. Hotić Sandra
27. Ivoić Miomira
28. Jahić Azra
29. Jakšić Vesna
30. Jauković Aleksandra
31. Jeremić Rada
32. Jevrić Marko
33. Jovanović Danijela
34. Jovanović Milan
35. Jovanović Tamara
36. Katanić Nataša
37. Korać Miloš
38. Kostić Miloš
39. Kostić Tomislav
40. Kovač Mirjana
41. Krstić Predrag
42. Krtinić Dane
43. Kuzmanović Miloš
44. Labudović Borović Milica
45. Lalović Nikola
46. Lazarević Milan
47. Lazić Jelena
48. Lukač Azra
49. Mačukanović Golubović Lana
50. Mandić Danijela
51. Marjanović Goran

REVIEWER ACKNOWLEDGMENT

The editors of the Serbian Journal of the Medical Chamber express their sincere gratitude for the tremendous assistance in evaluating the scientific merit of manuscripts to the following reviewers engaged in 2024:

52. Marjanović Slobodan
53. Marković Ivanka
54. Marković Roberta
55. Matejić Bojana
56. Matić Anđelković Slađana
57. Mijanović Radomir
58. Milenković Sanja
59. Milošević Jovana
60. Mioljević Vesna
61. Mira José Joaquin
62. Mirković Momčilo
63. Mitrović Ajtić Olivera
64. Nestorović Milica
65. Nešić Milica
66. Odalović Marina
67. Petrović Dejan
68. Preveden Tomislav
69. Pudar-Branković Georgina
70. Puškaš Nela
71. Rajković Marija
72. Santibañez Juan Francisco
73. Savić Aleksandar
74. Sekulić Borivoj
75. Simić-Vukomanović Ivana
76. Sindić-Antunović Sanja
77. Srećković Svetlana
78. Stamatović Dragana
79. Stamenković Željka
80. Stoičkov Viktor
81. Stojanović Maja
82. Stojković Anđelka
83. Stošić Biljana
84. Stošović Kalezić Ivana
85. Suljović-Hadžimešić Emina
86. Šaranović Milena
87. Šiljak Slađana
88. Šušnjević Sonja
89. Tamaš Tatjana
90. Terzić-Šupić Zorica
91. Tomić-Spirić Vesna
92. Trenkić Milan
93. Urošević Ivana
94. Vučić Miodrag
95. Vujičić Vesko
96. Vujić Dragana
97. Vujović Milena
98. Vukmirović Saša
99. Vuković Vuk
100. Žakula Nenad
101. Žarić Enisa

UPUTSTVO AUTORIMA ZA PRIPREMU RADOVA

Srpski medicinski časopis Lekarske komore objavljuje do sada neobjavljene originalne stručne i naučne radove, pregledne članke, kratka saopštenja, uvodnike, pisma uredniku, meta-analize, prikaze slučajeva, aktuelne teme, prikaze knjiga, radove iz istorije medicine i drugo, iz svih oblasti medicine, farmacije i stomatologije, čime doprinosi promociji i razvoju struke i nauke. Časopis se objavljuje u papirnom i elektronskom obliku četiri puta godišnje.

Da bi se rad razmatrao za publikovanje neophodno je da bude pripremljen prema propozicijama ovog Časopisa. U suprotnom Urednik može da ga odbije, bez daljih objašnjenja. Objavljivanje radova se ne honorariše. Prilikom prihvatanja rada za publikovanje svi autori prenose svoja autorska prava na izdavača časopisa.

Radovi se šalju elektronski. Adresa za prijavljivanje rada za časopis je <https://aseestant.ceon.rs/index.php/smdlk>. Časopis koristi otvoren sistem pristupa koji omogućava automatsko proveravanje plagijarizma i autoplagijarizma. Uz rad se šalju i odgovarajuće potvrde (videti na kraju ovog uputstva).

OPŠTA UPUTSTVA

Tekst rada treba da bude napisan latinicom u programu za obradu teksta *Word*, fontom *Times New Roman* i veličinom slova 12 tačaka (12 pt). Sve četiri margine treba podesiti na 25 mm, a veličinu stranice na format A4. Prored treba da bude 1,5, sa levim poravnanjem i uvlačenjem svakog pasusa za 10 mm. Ne treba da bude podeljenih reči (hifenacije). Ne treba koristiti tabulatore i uzastopne prazne karaktere (spejsove) radi poravnanja teksta, već alatke za kontrolu poravnanja u tulu. Za prelazak na novu stranu dokumenta koristi se isključivo *Page break*. Posle svakog znaka interpunkcije treba staviti samo jedan prazan karakter (spejs). Ako se u tekstu koriste specijalni znaci (simboli), koristite font iz paketa *Symbol*. Za nazive lekova koristiti isključivo generička imena. Uređaji (aparati) se označavaju fabričkim nazivima, a ime i mesto proizvođača treba navesti u obliku zagradama. Ukoliko se u tekstu koriste oznake koje su spoj slova i brojeva potrebno je precizno napisati broj koji se javlja u superskriptu ili supskriptu (na pr. ⁹⁹Tc, IL-6, O₂, B12, CD8 itd.). Ukoliko se nešto uobičajeno piše kurzivom (*italic*) tako se i navodi (npr. nazivi gena). Neophodno je koristiti međunarodni sistem mernih jedinica (SI), uz izuzetak temperature (°C) i krvnog pritiska (mmHg). Ukoliko je rad deo magistarske teze, odnosno doktorske disertacije, ili je urađen u okviru naučnog projekta, to treba posebno naznačiti u Napomeni na kraju teksta.

Za izradu grafičkih priloga koristite standardne grafičke programe za vindows (*Windows*), najbolje iz programskih paketa mikrosoft ofisa (*Excel*, *Word Graph*). Izbegavajte upotrebu boja, naročito prelaze boja i senčenje.

PRIPREMA RADA

Delovi rada su: naslovna strana, sažetak sa ključnim rečima, tekst rada, zahvalnost (po želji), literatura i prilozi.

NASLOVNA STRANA (prva strana) sadrži naslov rada bez skraćenica, predlog kratkog naslova rada, puna imena i prezimena autora (bez titula) indeksirana brojevima, zvaničan naziv ustanova u kojima autori rade, mesto i državu (redosledom koji odgovara indeksiranim brojevima autora). Na dnu stranice navesti ime i prezime, adresu za kontakt, broj telefona, faksa i imejl adresu autora zaduženog za korespondenciju. Naslovna strana treba da bude na spskom i engleskom jeziku (druga strana).

SAŽETAK treba da ima do 250 reči, uključujući skraćenice (treća strana). Za originalne radove, prethodno i kratko saopštenje, meta-analize i pregledne radove, sažetak treba da ima sledeću strukturu: Uvod, Cilj, Metode, Rezultati, Zaključak. Svaki od navedenih segmenata treba da bude napisan kao poseban pasus. Za prikaze slučajeva sažetak treba da ima sledeće delove: Uvod, Prikaz bolesnika, Zaključak. Svaki deo, takođe, pisati kao poseban pasus. Za ostale vrste radova sažetak nema posebnu strukturu. Ispod Sažetka navesti od tri do šest ključnih reči ili izraza. Ne tre-

INSTRUCTIONS FOR AUTHORS

The **Serbian Journal of the Medical Chamber** publishes previously unpublished, original professional and scientific papers, reviews, short communications, editorials, letters to the editor, meta-analyses, case reports, current topics, book reviews, papers on the history of medicine and more, from all fields of medicine, pharmacy and dentistry, therefore contributing to the promotion and development of the profession and science. The journal is published in print and electronic form four times per year.

In order for a paper to be considered for publication, it is necessary to prepare it according to the Journal's guidelines, otherwise the editor may reject it without further explanation. The publication of papers is not paid. When accepting a paper for publication, all authors transfer their copyrights to the Journal publisher.

Papers are submitted electronically. The web address for submitting papers is <https://aseestant.ceon.rs/index.php/smdlk>. The Journal uses an open access system that allows automatic checking for plagiarism and autoplagiarism. Appropriate certificates should be provided with the paper (see at the end of these instructions).

GENERAL INSTRUCTIONS

The paper should be submitted as a Microsoft Word document (.docx, .doc), using the Times New Roman font, size 12 pt. All four margins should be set to 25 mm and the page size to A4. The line spacing should be 1.5, with left alignment and 10 mm indentation of each paragraph. There should be no end-of-line hyphenation. The alignment tools should be used for aligning the text, not tabs or multiple spaces. Only the page-break should be used for a new page in the document. A single space should follow each punctuation mark. If special characters (symbols) are used in the text, use the font from the Symbol package. Use only generic names for drugs. Devices (equipment) should be identified using factory names, and the name and location of the manufacturer should be indicated in parentheses. If the text uses labels that are a combination of letters and numbers, it is necessary to appropriately write the number that appears in superscript or subscript (e.g. ⁹⁹Tc, IL-6, O₂, B12, CD8, etc.). If something is typically written in italic, it should be written so (e.g. gene names). International System of Units (SI) units should be used, with the exception of temperature (°C) and blood pressure (mmHg). If the paper is part of a master's thesis or doctoral dissertation, or was created within a scientific project, this should be specifically indicated in the Notes section, at the end of the text.

Graphics attachments should be created using standard graphics software for MS Windows, preferably from the MS Office suite (MS Excel, MS Word Graph). Use of colors should be avoided, especially gradients and shading.

PREPARING THE PAPER

The sections of the paper are: the cover page, the abstract and keywords, the text of the paper, acknowledgements (optional), literature, and attachments.

COVER PAGE (first page) should include the title of the paper, without acronyms, a suggested short title of the paper, the full names of the authors (without titles) indexed using numbers, the official name of the institutions where the authors work, place and country (in the order corresponding to the indexed numbers of the authors). At the bottom of the page, provide the name, contact address, phone number, fax number and email address of the corresponding author. The cover page should be in Serbian and English language (second page).

ABSTRACT should be up to 250 words, including acronyms (third page). For original papers, preliminary and short communications, meta-analyses and review papers, the abstract should have the following structure: Introduction, Aim, Methods, Results, Conclusion. Each of these segments should be written as a separate paragraph. For case report, the summary should have the following sections: Introduction, Case Report, Conclusion; each part should be written as a separate paragraph. For other types of papers, the abstract does not have a special structure. List three to six key words or phrases below the abstract. Words from the

ba da se ponavljaju reči iz naslova, a ključne reči treba da budu relevantne i opisne. U izboru ključnih reči koristiti *Medical Subject Headings* – MeSH (<http://www.nlm.nih.gov/mesh>). Sažetak treba da bude napisan na srpskom i engleskom jeziku.

Na četvrtoj **strani** treba da se nalazi prevod teksta koji je na trećoj strani (sažetak). Ova strana mora da ima identičnu strukturu trećoj strani.

Od pete strane broji se broj strana predviđen za odgovarajuću strukturu rada.

STRUKTURA RADA. Svi podnaslovi se pišu velikim masnim slovima (**bold**). Originalni rad, meta-analiza, prethodno i kratko saopštenje obavezno treba da imaju sledeće podnaslove: Uvod (Cilj rada navesti kao poslednji pasus Uvoda), Metode rada, Rezultati, Diskusija (koncizna, jasna, predstavlja tumačenje i poređenje rezultata studije sa relevantnim studijama koje su objavljene u domaćoj i međunarodnoj literaturi), Zaključak (mora proisteci isključivo iz rezultata istraživanja rada, Spisak skraćenica (ukoliko su korišćene u tekstu), Zahvalnica, Literatura (navodi se arapskim brojevima redosledom kojim je u tekstu navedena u uglastim zagradama, vidi dalje). Struktura rada kod pregleda literature sastoji se od Uvoda, Većeg broja podnaslova, Zaključka, Literature. Autori preglednog rada treba da navedu bar tri rada (kao autori ili koautori) publikovanih u časopisima s recenzijom. Struktura rada kod prikaza jednog ili više slučajeva čine: Uvod (Cilj rada navesti kao poslednji pasus Uvoda), Prikaz bolesnika, Diskusija, Literatura. Ne treba koristiti imena bolesnika, inicijale, niti brojeve istorija bolesti, naročito u ilustracijama. Prikazi slučajeva ne smeju imati više od pet autora.

STATISTIČKE METODE, PRIKAZ I INTERPRETACIJA REZULTATA

Ukoliko je moguće, sve numeričke vrednosti zaokružiti na jedno decimalno mesto. Ne duplirati prikaz rezultata u tabelama i grafikonima. Za prikaz rezultata u tabelama i tekstu preporuka je da se: numerički podaci sa normalnom raspodelom i bez ekstremnih vrednosti prikazuju kao aritmetička sredina $\pm$ standardna devijacija; numerički podaci čija raspodela odstupa od normalnosti ili kada postoje ekstremne vrednosti, i ordinalni podaci prikazuju kao medijana i opseg (minimalna – maksimalna vrednost); nominalni podaci i ordinalni podaci sa malim brojem kategorija prikazuju kao n (%).

Prilikom opisa primenjenih statističkih metoda, prikaza i interpretacije rezultata u radu pridržavati se *SAMPL Guidelines* (Lang TA, Altman DG. *Basic statistical reporting for articles published in biomedical journals: the "Statistical Analyses and Methods in the Published Literature" or the SAMPL Guidelines*. *Int J Nurs Stud* 2015;52(1):5-9.). Primenjene statističke metode treba opisati dovoljno detaljno da ih čitalac može ponoviti na svojim podacima. Navesti korišćeni statistički test i nivo značajnosti. Saopštiti tačnu *p*-vrednost na 3 decimalna mesta.

PRILOG (tabele, grafikone, slike itd.) postaviti na kraj rukopisa, a u samom tekstu jasno naznačiti mesto koje se odnosi na dati prilog. Krajnja pozicija priloga biće određena u toku pripreme rada za publikovanje.

SKRAĆENICE. Koristiti samo kada je neophodno, i to za veoma dugačke nazive hemijskih jedinjenja, odnosno nazive koji su kao skraćenice već prepoznatljivi (standardne skraćenice, kao npr. DNK, sida, HIV). Za svaku skraćenicu pun termin treba navesti pri prvom navođenju u tekstu, sem ako nije standardna jedinica mere. U naslovi se ne koriste skraćenice. Izbegavati korišćenje skraćenica u sažetku, ali ako su neophodne, svaku skraćenicu objasniti pri prvom navođenju u tekstu.

DECIMALNI BROJEVI. U tekstu rada na engleskom jeziku, u tabelama, na grafikonima i drugim priložima decimalne brojeve pisati sa tačkom (npr. 12.5 ± 3.8), a u tekstu na srpskom jeziku sa zarezom (npr. $12,5 \pm 3,8$). Kad god je to moguće, broj zaokružiti na jednu decimalu.

JEDINICE MERA. Dužinu, visinu, težinu i zapreminu izražavati u metričkim jedinicama (metar – m, kilogram (gram) – kg (g), litar – l) ili njihovim delovima. Temperaturu izražavati u stepenima Celzijusa (°C), količinu supstance u molima

title should not be repeated, and the key words should be relevant and descriptive. The Medical Subject Headings – MeSH thesaurus (<http://www.nlm.nih.gov/mesh>) should be used for selecting the key word. The abstract should be submitted in both Serbian and English language.

The **fourth page** should contain the translation of the text from the third page (abstract). This page must have the identical structure as the third page.

The number of pages provided for the appropriate structure of the paper is counted from the fifth page.

STRUCTURE OF THE PAPER. Capital bold letters should be used for all subheadings. Original papers, meta-analyses, preliminary and short communications must have the following subheadings: Introduction (the objective of the paper should be stated in the last paragraph of the Introduction), Methodologies, Results, Discussion (concise and clear, it represents the interpretation and comparison of study results with relevant studies published in domestic and international literature), Conclusion (it must derived solely from the results of the research), List of acronyms (if used in the text), Acknowledgment, and Literature (listed using Arabic numerals, in the order in which they appear in the text, in square brackets, see below). The structure of literature review papers should be: Introduction, a number of subheadings, Conclusion, and Literature. The authors of the reviews should list at least three papers (as authors or co-authors) published in peer-reviewed journals. The structure of the paper presenting one or more cases should consists of: Introduction (the objective of the paper should be given as the last paragraph of the Introduction), Case Report, Discussion, and Literature. Patient names, initials, and medical history numbers should not be used, especially in illustrations. Case reviews should not have more than five authors.

STATISTICAL METHODS, PRESENTATION AND INTERPRETATION OF RESULTS

If possible, all numbers should be rounded to one decimal place. The display of results in tables and graphs should not be repeated. When presenting results in tables and text, it is recommended that numerical data with normal distribution and without extreme values be presented as arithmetic mean $\pm$ standard deviation; that numerical data whose distribution deviates from normal distribution or when there are extreme values, and ordinal data, be presented as the median and range (minimum–maximum value); that nominal data and ordinal data with a small number of categories be displayed as n (%).

When describing the applied statistical methods, presentation and interpretation of results in the paper, follow the *SAMPL Guidelines* (Lang TA, Altman DG. *Basic statistical reporting for articles published in biomedical journals: The "Statistical Analyses and Methods in the Published Literature" or the SAMPL Guidelines*. *Int J Nurs Stud* 2015; 52(1):5-9.). The applied statistical methods should be described in sufficient detail so that the reader may repeat them using own data. Indicate the statistical test used and the level of significance. Report the correct *p*-value to the third decimal place.

ATTACHMENTS (tables, graphs, pictures, etc.) should be placed at the end of the manuscript, while clearly indicating in the text the place that refers to the given attachment. The final position of the attachment will be defined during the preparation of the paper for publication.

ACRONYMS should be used only when necessary, i.e. for very long names of chemical compounds and names that are already commonly used as acronyms (standard acronyms, such as DNA, AIDS, HIV). For each acronym, the full term should be given at the first appearance in the text, unless it is a standard unit of measure. Acronym should not be used in the title. Avoid using acronyms in the abstract, but if necessary, explain each acronym at the first appearance in the text.

DECIMAL NUMBERS. In the English text of the paper, in tables, graphs and other appendices decimal numbers are written with a point (e.g. 12.5 ± 3.8), and in the text in Serbian with a comma (e.g. $12,5 \pm 3,8$). Whenever possible, round the number to one decimal place.

(mol), a pritisak krvi u milimetrima živinog stuba (mm Hg). Sve rezultate hematoloških, kliničkih i biohemijskih merenja navoditi u metričkom sistemu prema Međunarodnom sistemu jedinica (SI).

PRILOZI su tabele, slike (fotografije, crteži, sheme, grafikoni), do šest po radu. Svaki prilog se dostavlja kao poseban dokument, obeležen na isti način kao u tekstu. Ako su tabele, grafikoni, sheme ili slike već objavljene, navesti originalni izvor i priložiti pisano odobrenje autora za njihovo korišćenje

TABELE. Svaka tabela treba da bude sama po sebi lako razumljiva. Naslov treba otkucati iznad tabele, a objašnjenja ispod nje. Tabele se označavaju arapskim brojevima prema redosledu navođenja u tekstu. Tabele crtati isključivo u programu *Word*, kroz meni *Table–Insert–Table*, uz definisanje tačnog broja kolona i redova koji će činiti mrežu tabele. Desnim klikom na mišu – pomoću opcija *Merge Cells* i *Split Cells* – spajati, odnosno deliti ćelije. Kucati fontom *Times New Roman*, veličinom slova 12 pt, s jednostrukim proredom i bez uvlačenja teksta. Korišćene skraćenice u tabeli treba objasniti u legendi ispod tabele. Ukoliko je rukopis na srpskom jeziku, priložiti nazive tabela i legendu na oba jezika. Takođe, u jednu tabelu, u okviru iste ćelije, uneti i tekst na srpskom i tekst na engleskom jeziku (nikako ne praviti dve tabele na dva jezika!).

SLIKE. Slike su svi oblici grafičkih priloga. Objavljaju se fotografije, crteži, sheme i grafikoni. Slike se označavaju arapskim brojevima prema redosledu navođenja u tekstu. Primaju se isključivo digitalne fotografije (crno-bele ili u boji) rezolucije najmanje 300 dpi i formata zapisa *tiff* ili *jpg* (male, mutne i slike lošeg kvaliteta neće se prihvatati za štampanje!). Ukoliko autori nemaju ili nisu u mogućnosti da dostave digitalne fotografije, onda originalne slike treba skenirati u rezoluciji 300 dpi i u originalnoj veličini. Ukoliko je rad neophodno ilustrovati sa više slika, u radu će ih biti objavljeno nekoliko, a ostale će biti u e-verziji članka kao PowerPoint prezentacija (svaka slika mora biti numerisana i imati legendu). U legendi slika treba napisati korišćeno uveličanje okulara i objektiv mikroskopa. Svaka fotografija treba da ima vidljivu skalu. Potrebno je priložiti nazive slika i legendu na srpskom i engleskom jeziku.

GRAFIKONI. Grafikoni treba da budu urađeni i dostavljeni u programu *Excel*, da bi se videle prateće vrednosti raspoređene po ćelijama. Iste grafikone prekopirati i u *Word*-ov dokument. Grafikoni se označavaju arapskim brojevima prema redosledu navođenja u tekstu. Svi podaci na grafikonu kucaju se u fontu *Times New Roman*. Korišćene skraćenice na grafikonu treba objasniti u legendi ispod grafikona. Priložite nazive grafikona i legendu na srpskom i engleskom jeziku.

HEME I CRTEŽI. Crteži i sheme se dostavljaju u *jpg* ili *tiff* formatu. Svi podaci na shemi kucaju se u fontu *Times New Roman*, veličina slova 10 pt. Korišćene skraćenice na shemi treba objasniti u legendi ispod sheme. Ukoliko je rukopis na srpskom jeziku, priložiti nazive shema i legendu na oba jezika.

ZAHVALNICA. Navesti sve saradnike koji su doprineli stvaranju rada a ne ispunjavaju kriterijume za autorstvo, kao što su osobe koje obezbeđuju tehničku pomoć, pomoć u pisanju rada ili rukovode odeljenjem koje obezbeđuje opštu podršku. Finansijska i materijalna pomoć, u obliku sponzorstva, stipendija, poklona, opreme, lekova i drugo, treba takođe da budu navedene.

LITERATURA. Spisak referenci je odgovornost autora, a citirani članci treba da budu lako pristupačni čitaocima časopisa. Reference numerisati rednim arapskim brojevima prema redosledu navođenja u tekstu. Broj referenci ne bi trebalo da bude veći od 30, osim u pregledu literature, u kojem je dozvoljeno da ih bude do 50, a u meta-analizi do 100.

Broj citiranih originalnih radova mora biti najmanje 80% od ukupnog broja referenci, odnosno broj citiranih knjiga, poglavlja u knjigama i preglednih članaka manji od 20%. Nije dozvoljeno citiranje apstrakata. Ukoliko je bitno komentarisati rezultate koji su publikovani samo u vidu apstrakta, neophodno je to navesti u samom tekstu rada. Reference članaka koji su prihvaćeni za štampu,

UNITS OF MEASURE. Express length, weight and volume in metric units (meter – m, kilogram (gram) – kg (g), liter – l) or their parts. Express temperature in degrees Celsius (°C), amount of substance in moles (mol), and blood pressure in millimeters of mercury (mmHg). All results of hematological, clinical and biochemical measurements should be reported using the metric system, according to the International System of Units (SI).

ATTACHMENTS are tables, pictures (photographs, drawings, diagrams, graphs), up to six per paper. Each attachment is submitted as a separate document, labeled the same way as it appears in the text. If tables, graphs, charts or figures have already been published, the original source should be indicated, and written consent for their use attached.

TABLES. Tables should be easily comprehensible. The caption should be typed above the table, with an explanation below it. Tables are labeled with Arabic numerals, according to the order of appearance in the text. Tables should be drawn only in MS Word, using the Insert Table function, defining the exact number of columns and rows that will form the table grid. Use Merge Cells and Split Cells options to merge or split cells. Use Times New Roman font, size 12 pt, with single spacing and no indentation. The acronyms used in the table should be explained in the legend below the table. If the manuscript is in Serbian, attach the names of the tables and the legend in both languages. Also, enter the Serbian text and English text in the same table, within a single cell (never make two tables in two languages).

IMAGES. All forms of graphic attachments are images. Photographs, drawings, diagrams and graphs can be published. Images are labeled using Arabic numerals, according to the order of appearance in the text. Only digital photos (black-and-white or color) of at least 300 dpi resolution, in TIFF or JPG format are accepted (small, blurry and poor-quality images will not be accepted for print). If the authors do not have or are not able to submit digital photos, then the original images should be scanned at a resolution of 300 dpi and in original size. If the paper requires multiple images for illustration, several will be published in the paper, and the rest will be included in the e-version of the article, as a MS PowerPoint presentation (each image must be numbered and include a legend). The used microscope magnification should be noted in the image legend. Each photo should include the scale. The image names and the legend should be provided in both Serbian and English language.

GRAPHS. Graphs should be provided and submitted in MS Excel, in order to show the accompanying values arranged by cell. The same graphs should be copied into a MS Word document. Graphs are labeled with Arabic numerals, according to the order of appearance in the text. All data in the graphs should be displayed using the Times New Roman font. Acronyms used on the graph should be explained in the legend below the graph. Include the names of the graphs and the legend in both Serbian and English language.

DIAGRAMS AND DRAWINGS. Diagrams and drawings can be submitted in JPG or TIFF format. All data in the diagram should be displayed using the Times New Roman font, size 10 pt. The acronyms used in the diagram should be explained in the legend below the diagram. If the manuscript is submitted in Serbian, the names of the diagrams and the legends should be provided in both Serbian and English language.

ACKNOWLEDGEMENTS. List all associates who contributed to the production of the paper but do not meet the authorship criteria, such as persons providing technical assistance, assistance in writing the paper, or managing the department that provided general support. Financial and material assistance, in the form of sponsorships, scholarships, donations, equipment, medicine, etc., should also be listed.

LITERATURE. The list of references is the responsibility of the author, and the cited articles should be easily accessible to the readers of the Journal. References should be numbered using Arabic numerals, according to the order of appearance in the text. The number of references should not exceed 30, except in the case of literature reviews, in which case it may be up to 50, and up to 100 in the case of meta-analyses.

ali još nisu objavljeni, treba označiti sa *in press* i priložiti dokaz o prihvatanju rada za objavljivanje.

Podaci o korišćenju literaturi u tekstu označavaju se arapskim brojevima u uglastim zagrada – npr. [1,2], i to redosledom kojim se pojavljuju u tekstu. Reference se citiraju prema **Vankuverskom stilu** (uniformisanim zahtevima za rukopise koji se predaju biomedicinskim časopisima), koji je uspostavio Međunarodni komitet urednika medicinskih časopisa (<http://www.icmje.org>), čiji format koriste U.S. National Library of Medicine i baze naučnih publikacija. Primeri navođenja publikacija (članaka, knjiga i drugih monografija, elektronskog, neobjavljenog i drugog objavljenog materijala) mogu se pronaći na internet-stranici http://www.nlm.nih.gov/bsd/uniform_requirements.html. Prilikom navođenja literature veoma je važno pridržavati se pomenutog standarda, jer je to jedan od najbitnijih faktora za indeksiranje prilikom klasifikacije naučnih časopisa. Podaci sa interneta citiraju se uz navođenje datuma pristupa tim podacima.

PREDVIĐEN BROJ STRANICA ZA RAD SA SVIM PRILozIMA

- Uvodnici** – do 5 strana: mišljenja ili diskusiju o posebno značajnoj temi za Časopis, kao i o podacima koji su štampani u ovom ili nekom drugom časopisu. Obično ih piše jedan autor po pozivu.
- Originalni članci** – do 12 strana. Predstavljaju rezultate istraživanja autora rada i njihovo tumačenje. Istraživanje treba da bude obrađeno i izloženo na način da se može ponoviti, a analiza rezultata i zaključci jasni da bi se mogli proveriti.
- Pregledni članci** – do 10 strana. Predstavljaju sistematsko, sveobuhvatno i kritičko izlaganje problema na osnovu analiziranih i diskutovanih podataka iz literature, a koji oslikavaju postojeću situaciju u određenom području istraživanja. Literatura koja se koristi u radu mora da sadrži najmanje 3 rada autora članka iz uže naučne oblasti koja je opisana u radu.
- Prethodna ili kratka saopštenja** – do 4 strane. Sadrže izuzetno važne naučne rezultate koje bi trebalo objaviti u što kraćem vremenu. Ne moraju da sadrže detaljan opis metodologije rada i rezultata, ali moraju da imaju sva poglavlja kao originalni članci u sažetoj formi.
- Stručni članci** – do 10 strana. Odnose se na proveru ili prikaz prethodnog istraživanja i predstavljaju koristan izvor za širenje znanja i prilagođavanja originalnog istraživanja potrebama postojeće nauke i prakse.
- Prikazi slučajeva** – do 6 strana. Opisuje retke slučajeve iz prakse. Slični su stručnim člancima. U ovim radovima prikazuju se neuobičajeni oblici i tokovi oboljenja, neočekivane reakcije na primenjenu terapiju, primene novih dijagnostičkih procedura ili retke i nove bolesti.
- Članci iz istorije medicine** – do 10 strana. Ovi članci opisuju događaje iz prošlosti sa ciljem da omoguće očuvanje medicinske i zdravstvene kulture. Imaju karakter stručnih članaka.
- Ostali članci** – prikazi knjiga, izvodi iz strane literature, izveštaji sa kongresa i stručnih sastanaka, saopštenja o radu pojedinih zdravstvenih organizacija, podružnica i sekcija, saopštenja Uredništva, pisma Uredništvu, novosti u medicini, pitanja i odgovori, stručne i naučne vesti i članci napisani u znak sećanja (*In memoriam*).

Original papers must account for at least 80% of the total number of references, i.e. the number of cited books, book chapters, and reviews must be less than 20%. Citing abstracts is not permitted. If it is important to comment on results that have been published only in the form of an abstract, it is necessary to cite this in the text of the paper. References to articles that have been accepted for publication but have not yet been published should be marked "in press" and proof of acceptance of the paper for publication should be attached.

Information about the literature used in the paper is indicated in the text by Arabic numerals in square brackets, e.g. [1,2], in the order in which they appear in the text. References are cited according to the **Vancouver style** (Uniform Requirements for Manuscripts Submitted to Biomedical Journals), established by the International Committee of Medical Journal Editors (<http://www.icmje.org>), whose format is used by the U.S. National Library of Medicine and scientific publication databases. Examples of citations of publications (articles, books and other monographs, electronic, unpublished and other published material) are available at http://www.nlm.nih.gov/bsd/uniform_requirements.html. When citing literature, it is very important to abide by the mentioned standard, because it is one of the most important indexing factors when classifying scientific journals. Online data is cited with the date of access to that data.

NUMBER OF PAGES FOR THE PAPER (WITH ALL ATTACHMENTS)

- Editorials** (up to 5 pages) present opinions or discussions on a particularly relevant topic for the Journal, as well as on data published in this or other journals. They are usually written by one author, by invitation.
- Original articles** (up to 12 pages) present the results of the research of the authors of the paper and their interpretation. The research should be processed and presented in a way that can be repeated, and the analysis of results and conclusions should be clear so that they can be verified.
- Reviews** (up to 10 pages) represent the systematic, comprehensive and critical presentation of a problem on the basis of analyzed and discussed data from literature, which reflect the state of the science in a particular area of research. The literature used in the paper must contain at least 3 papers by the author of the article from the specific scientific field addressed in the paper.
- Preliminary and short communications** (up to 4 pages) contain extremely important scientific results that should be published as soon as possible. They do not have to contain a detailed description of the methodology and results, but they must contain all the same sections as original articles, in a concise form.
- Professional articles** (up to 10 pages) refer to the verification or presentation of previous research; they represent a useful means of disseminating knowledge and adapting original research to the needs of existing science and practice.
- Case report** (up to 6 pages) describe rare cases from practice and are similar to professional articles. These papers present unusual forms and courses of disease, unexpected reactions to the applied therapy, application of new diagnostic procedures, or rare and new diseases.
- History of medicine articles** (up to 10 pages) describe developments from the past, with the aim of preserving medical and health culture. They have the same form as professional articles.
- Other articles** – book reviews, excerpts from foreign literature, reports from congresses and professional conferences, statements on the operation of health organizations, branches and sections, editorial statements, letters to the editorial board, medical news, questions and answers, professional and scientific news and articles written in commemoration (*in memoriam*).

U POSTUPKU PRIJAVE

U postupku prijave neophodno je da se naglasi kojoj kategoriji rad pripada: uvodnik, stručni rad, originalni rad, prethodna ili kratka saopštenja, pregledni članak, prikaz slučaja, prikaz serije slučajeva, članak iz istorije medicine i drugo.

Uz rad neophodno je da se pošalje:

- 1) saglasnost svih autora, da rad nije delimično ili u celini objavljen, poslat ili prihvaćen za štampu u drugom časopisu,
- 2) potpisana izjava svih autora da su rukopis pročitali i odobrili za objavljivanje u časopisu sa navođenjem njihovog doprinosa u realizaciji istraživanja i pisanja rada,
- 3) izjava o nepostojanju sukoba interesa.

Autori su dužni da se pridržavaju etičkih standarda koji se odnose na naučnoistraživački rad. (*The Declaration of Helsinki, The Basel Declaration, Good Laboratory Practice, Good Clinical Practice, ICMJE guidelines*).

IN THE SUBMISSION PROCEDURE

in the submission procedure it is necessary to point out which category the paper belongs to: editorial, professional paper, original paper, preliminary or short communications, review article, case review, case series review, paper on the history of medicine, or other.

Together with the paper, it is necessary to include:

- 1) signed statements of all the authors that the work has not been partially or entirely published, sent or accepted for publication in another journal;
- 2) signed statements of all authors that they have read the manuscript and approved it for publication in the Journal, stating their contribution to the study or the writing of the paper,
- 3) a declaration on absence of conflict of interest.

It is the responsibility of each author to ensure that manuscripts submitted to Srpski medicinski časopis Lekarske komore are written in accordance with ethical standards (*The Declaration of Helsinki, The Basel Declaration, Good Laboratory Practice, Good Clinical Practice, ICMJE guidelines*).

CIP - Каталогизacija y publikaciji
Народна библиотека Србије, Београд

61

SRPSKI medicinski časopis Lekarske komore

= Serbian journal of the Medical chamber / glavni i odgovorni urednik Milena Šantrić-Milićević. - [Štampano izd.]. - Vol. 1, br. 1 (sep. 2020)- . - Beograd : Lekarska komora Srbije, 2020- (Novi Sad : Sajnos). - 30 cm

Tromesečno. - Tekst na srp. i engl. jeziku. - Drugo izdanje na drugom medijumu: Srpski medicinski časopis Lekarske komore (Online) = ISSN 2737-9752

ISSN 2737-971X = Srpski medicinski časopis Lekarske komore (Štampano izd.)

COBISS.SR-ID 19685641