

**Socijalna farmacija i farmaceutsko zakonodavstvo**  
**Social Pharmacy and Pharmaceutical Legislation**

# SADRŽAJ - CONTENTS

SFZ-P1

**FAKTORSKA ANALIZA UPITNIKA ZA PROCENU STAVOVA FARMACEUTA I FARMACEUTSKIH TEHNIČARA U VEZI SA SAVETOVANJEM ŽENA REPRODUKTIVNE DOBI O ADEKVATNOM UNOSU FOLATA (A-FOL-PH)**

**FACTOR ANALYSIS OF QUESTIONNAIRE EVALUATING ATTITUDES OF PHARMACISTS AND PHARMACY TECHNICIANS WITH REGARDS TO COUNSELLING WOMEN OF REPRODUCTIVE AGE ON ADEQUATE FOLATE INTAKE (A-FOL-PH)**

- [Milica Zeković, Dušanka Krajnović, Tatjana Stojković, Mirjana Gurinović, Marija Glibetić](#) **735**

SFZ-P2

**ZNANJE FARMACEUTA I FARMACEUTSKIH TEHNIČARA O FOLNOJ KISELINI I PREVENCIJI DEFEKATA NERVNE CEVI: EVALUACIJA UPEŠNOSTI EDUKATIVNE INTERVENCIJE**

**COMMUNITY PHARMACISTS' AND PHARMACY TECHNICIANS' KNOWLEDGE OF FOLIC ACID AND NEURAL TUBE DEFECTS PREVENTION: EDUCATIONAL INTERVENTION EFFECTIVENESS EVALUATION**

- [Milica Zeković, Dušanka Krajnović, Tatjana Stojković, Mirjana Gurinović, Marija Glibetić](#) **737**

SFZ-P3

**SKRINING DEPRESIJE KOD TRUDNICA I ŽENA U POSTPARTALNOM PERIODU PRIMENOM EPDS SKALE - PILOT STUDIJA**

**DEPRESSION SCREENING FOR PREGNANT WOMEN AND WOMEN IN THE POSTPARTUM PERIOD USING THE EPDS SCALE - A PILOT STUDY**

- [Dragoslav Petronijević, Miloš Petronijević, Svetlana Vrzić- Petronijević, Zorica Jestrović, Jasminka Bjeletić, Marina Odalović, Ljiljana Tasić](#) **739**

SFZ-P4

**ISPITIVANJE FAKTORA RIZIKA ZA RAZVOJ OSTEOPOROZE U POPULACIJI ŽENA**

**THE ANALYSIS OF OSTEOPOROSIS RISK FACTORS IN FEMALE POPULATION**

- [Zorana Majkić, Ivana Tadić, Ljiljana Tasić](#) **741**

SFZ-P5

**POZNAVANJE I PRIMJENA KONTRACEPTIVNIH METODA U PERIODU ADOLESCENCIJE**

**THE KNOWLEDGE AND USE OF CONTRACEPTIVE METHODS AMONG ADOLESCENTS**

- Vera Dabanović, Miomir Šoškić

743

SFZ-P6

**ZNANJE, STAVOVI I UPOTREBA HITNE KONTRACENCIJE NA TERITORIJI GRADA BEOGRADA - DA LI SE NEŠTO PROMENILO NAKON DONOŠENJA STRATEŠKIH DOKUMENATA**

**KNOWLEDGE, ATTITUDES AND USE OF EMERGENCY CONTRACEPTION - HAVE ANYTHING CHANGED AFTER ADOPTION OF STRATEGIC DOCUMENTS**

- Zagorka Matić, Marina Odalović,  
Dragana Lakić, Ljiljana Tasić

745

SFZ-P7

**THE PHARMACY- FRIEND OF BREASTFEEDING**

- Katarina Fehir Šola, Ruža Bundović

747

SFZ-P8

**AGEING OF THE POPULATION - THE NECESSITY FOR ACTION**

- Ingrid Kummer, Ljiljana Tasić

748

SFZ-P9

**PRUŽANJE USLUGE SAVETOVANJA STARIJIH PACIJENATA O PRIMENI LEKOVA – STAVOVI FARMACEUTA**

**PROVISION OF PHARMACEUTICAL SERVICE TO ELDERLY PATIENTS ABOUT SAFE USE OF MEDICINES - THE ATTITUDES OF PHARMACISTS**

- Ivana Tadić, Ljiljana Tasić,  
Isidora Bošković, Stefan Mijatović,  
Sanja Jović, Marina Odalović, Dragana Lakić

749

SFZ-P10

**STAVOVI PACIJENATA I UPOTREBA LEKOVA BEZ LEKARSKOG RECEPTA NA  
TERITORIJI GRADA BEOGRADA – ANALIZA PROMENA I TRENDOVA**

**ATTITUDES OF PATIENTS AND USAGE OF NON-PRESCRIPTION MEDICINES  
IN BELGRADE – CHANGES OVER THE LAST FOUR YEARS**

- **Tatjana Plazinić, Ivana Tadić,  
Marina Odalović, Ljiljana Tasić, Dragana Lakić** **751**

SFZ-P11

**EVALUACIJA PRUŽANJA FARMACEUTSKIH USLUGA U APOTECI BEOGRAD**

**ANALYSES OF THE PHARMACEUTICAL CARE SERVICES PROVIDED BY  
COMMUNITY PHARMACISTS WITHIN THE PHARMACY BELGRADE**

- **Jasminka Bjeletić, Ivana Tadić, Ljiljana Tasić,  
Sanja Jović, Marina Odalović, Dragana Lakić** **753**

SFZ-P12

**ANALIZA POZIVA UPUĆENIH CENTRU ZA INFORMACIJE O LEKOVIMA  
APOTEKE BEOGRAD**

**PHARMACY BEOGRAD - ANALYSIS OF CALLS REFERRED TO THE DRUG  
INFORMATION CENTER**

- **Nikola Radunović, Tatjana Žunić** **755**

SFZ-P13

**EVIDENTIRANJE FARMACEUTSKIH USLUGA U APOTECI SUBOTICA**

**RECORDING OF PHARMACEUTICAL SERVICES IN PHARMACY SUBOTICA**

- **Tatjana Crnjanski, Dušanka Krajnović,  
Milan Rakić, Martina Jaramazović** **757**

SFZ-P14

**GREŠKE U IZDAVANJU LEKOVA U JAVNIM APOTEKAMA: PERSPEKTIVA  
SRBIJE**

**DISPENSING ERRORS IN COMMUNITY PHARMACIES: A SERBIAN  
PERSPECTIVE**

- **Tatjana Stojković, Valentina Marinković,  
Milica Zeković, Dušanka Krajnović, Ljiljana Tasić** **759**

SFZ-P15

**PROAKTIVAN PRISTUP UNAPREĐENJU BEZBEDNOSTI PACIJENATA U  
JAVNIM APOTEKAMA: PRIMENA ANALIZE NAČINA I EFEKATA OTKAZA  
PROACTIVE APPROACH TO ENHANCING PATIENT SAFETY IN COMMUNITY  
PHARMACIES: APPLICATION OF FAILURE MODE AND EFFECTS ANALYSIS**

- **Tatjana Stojković, Valentina Marinković,  
Ulrich Jaehde, Tanja Manser**

**761**

SFZ-P16

**UPRAVLJANJE RIZIKOM U PRUŽANJU ZDRAVSTVENE ZAŠTITE  
KORIŠĆENJEM CIT METODE  
RISK MANAGEMENT IN PROVIDING HEALTH CARE USING CIT METHOD**

- **Jovana Mudrić, Valentina Marinković**

**763**

SFZ-P17

**DA LI RODITELJI U SRBIJI RAZUMEJU UOBIČAJENE NAVODE UPOZORENJA U  
UPUTSTVIMA ZA LEKOVE ZA PEDIJATRIJSKU PRIMENU?**

**DO PARENTS IN SERBIA UNDERSTAND COMMON WARNING STATEMENTS  
IN PEDIATRIC MEDICINES INFORMATION?**

- **Stana Ubavić, Nataša Bogavac-Stanojević,  
Ljiljana Tasić, Sofija Vrceelj-Jovanović, Dušanka Krajnović**

**765**

SFZ-P18

**INTERAKCIJE HRANE I ANTIMIKROBNIH AGENASA: KONZISTENTNOST  
INFORMACIJA ZA GENERIČKE LEKOVE**

**FOOD-ANTIMICROBIAL AGENT INTERACTIONS: CONSISTENCY OF  
INFORMATION FOR GENERIC DRUGS**

- **Božana Nikolić**

**767**

SFZ-P19

**LANA TAFI – BORAC PROTIV FALSIFIKATORA: PODIZANJE I IZMENA SVESTI MLADIH O LAŽNIM LEKOVIMA KROZ INTERAKTIVNU STRIP IGRU**

**LANA TAFI - FIGHTER AGAINST FALSIFICATION: RAISING AND CHANGING YOUNG PEOPLE'S AWARENESS OF FAKE MEDICINES THROUGH AN INTERACTIVE COMIC BOOK GAME**

- **Pavle Zelić, Domenico Di Giorgio,  
Luisa Salmaso, Claudio Barbaranelli,  
Gaia Barbaglio, Dušanka Krajnović, Jelena Manojlović** 769

SFZ-P20

**NEW EU MEDICAL DEVICES REGULATIONS - KEY CHALLENGES RELATED TO QUALITY AND SAFETY OF MEDICAL DEVICES**

- **Marko Koevski, Jasmina Tonic Ribarska,  
Katerina Ancevska Netkowska, Suzana Trajkovic Jolevska** 771

SFZ-P21

**NEW ROLE OF POST-MARKET SURVEILLANCE IN MEDICAL DEVICE INDUSTRY**

- **Elena Ivanovska, Jasmina Tonic Ribarska,  
Jelena Lazova, Nada Popstefanova,  
Marija Davcheva Jovanoska, Suzana Trajkovic Jolevska** 772

SFZ-P22

**UPRAVLJANJE KRITIČNIM INCIDENTIMA U FARMACEUTSKOM LANCU SNABDEVANJA**

**MANAGEMENT OF CRITICAL INCIDENTS IN THE PHARMACEUTICAL SUPPLY CHAIN**

- **Jelena Vasić, Valentina Marinković** 773

SFZ-P23

**TRANSPORT LEKOVA I MEDICINSKIH SREDSTAVA BESPILOTNOM LETELICOM**

**TRANSPORT OF MEDICINES AND MEDICAL DEVICES BY UNMANNED AIRCRAFT**

- **Slađana Danilović, Ljiljana Tasić,  
Milorad Kilibarda, Valentina Marinković** 775

SFZ-P24

**BUDUĆI TRENDOVI FARMACEUTSKOG TRŽIŠTA I KLJUČNI FAKTORI  
FUTURE TRENDS OF THE PHARMACEUTICAL MARKETPLACE AND KEY  
FACTORS**

- **Nina Dragičević, Dušanka Krajnović,  
Valentina Marinković, Ljiljana Tasić**

777

SFZ-P25

**MARKET ACCESS OF ANTIPSYCHOTIC DRUGS IN REPUBLIC MACEDONIA**

- **Bistra Angelovska, Elena Drakalska,  
Hristina Seremetkovska, Aleksandar Cvetkovski**

779

SFZ-P26

**ANALIZA POTROŠNJE LEKOVA ZA KARDIOVASKULARNI SISTEM U SRBIJI  
TOKOM PERIODA 2006-2015. GODINA**

**ANALYSIS OF CARDIOVASCULAR DRUGS CONSUMPTION IN SERBIA DURING  
THE PERIOD 2006-2015**

- **Tatjana Žunić, Marina Odalović, Ljiljana Tasić**

780

SFZ-P27

**ANALIZA POTROŠNJE LEKOVA U TERAPIJI DEPRESIJE NA TERITORIJI  
GRADA BEOGRADA**

**ANALYSIS OF DRUG CONSUMPTION IN THE DEPRESSION THERAPY IN  
BELGRADE**

- **Tamara Traljić, Jasminka Bjeletić,  
Marina Odalović, Ljiljana Tasić**

782

SFZ-P28

**ANALIZA POTROŠNJE ANTIMIKROBNIH LEKOVA U TERAPIJI INFEKCIJA  
UROTRAKTA**

**ANALYSIS OF CONSUMPTION OF ANTIMICROBIAL DRUGS IN THE URINARY  
TRACT INFECTION**

- **Jelena Pantović, Marina Odalović, Ljiljana Tasić**

784

SFZ-P29

**ANALIZA POTROŠNJE ANTIMIKROBNIH LEKOVA U TERAPIJI UPALE  
SREDNJEG UHA KOD DECE**

**ANALYSIS OF THE CONSUMPTION OF ANTIMICROBIAL DRUGS IN THE  
TREATMENT OF OTITIS MEDIA IN CHILDREN**

- Marija Pavlović

786

SFZ-P30

**SAVREMENE MOGUĆNOSTI KONTROLE POTROŠNJE LIJEKOVA SA  
ESENCIJALNE LISTE U KANTONU SARAJEVO**

**CONTEMPORARY POSSIBILITIES OF CONTROLLING CONSUMPTION OF  
ESSENTIAL LIST MEDICATIONS IN CANTON SARAJEVO**

- Vedina Čordalija, Fahir Bečić

788

SFZ-P31

**PROCENA POUZDANOSTI SKALE ZA ISPITIVANJE BIOETIČKIH ASPEKATA  
ISTRAŽIVANJA FARMACEUTSKE PRAKSE**

**RELIABILITY ASSESSMENT OF A SCALE FOR TESTING BIOETHICAL ASPECTS  
OF PHARMACEUTICAL PRACTICE RESEARCH**

- Dragana Jocić, Dušanka Krajnović

790

SFZ-P32

**KONTINUIRANA EDUKACIJA FARMACEUTA - OD STAVOVA KA ISHODIMA  
PROFESIONALNE PRAKSE**

**CONTINUING EDUCATION OF PHARMACISTS- FROM ATTITUDES TO  
OUTCOMES OF PROFESSIONAL PRACTICE**

- Slađana Tanasković, Ljiljana Tasić

792

SFZ-P33

**INTERPROFESIONALNO OBRAZOVANJE STUDENATA ZDRAVSTVENIH  
NAUKA - PRVA ISKUSTVA NA UNIVERZITETU U BEOGRADU**

**INTERPROFESSIONAL EDUCATION OF HEALTH SCIENCES STUDENTS - THE  
FIRST EXPERIENCE AT THE UNIVERSITY OF BELGRADE**

- Danijela Đukić-Čosić, Ivana Tadić, Sandra Vezmar Kovačević,  
Katarina Radović, Jelena Parojčić, Ljiljana Tasić

794

SFZ-P34

**UNAPREĐENJE NASTAVNIČKIH I MENTORSKIH KOMPETENCIJA ZA  
OBRAZOVANJE ZDRAVSTVENIH PROFESIONALACA: RAZVOJ ZAJEDNIČKOG  
PROGRAMA KONTINUIRANE EDUKACIJE NASTAVNIKA I SARADNIKA  
ZDRAVSTVENIH NAUKA**

**TEACHING CERTIFICATE IN HEALTH PROFESSIONS EDUCATION: JOINT  
CURRICULUM DEVELOPMENT**

**- Marina Odalović, Lidija Radulović, Snežana Medić,  
Miloš Bajčetić, Martin Henman, Nada Kovačević,  
Jelena Parojčić, Ljiljana Tasić**

**796**

## **FAKTORSKA ANALIZA UPITNIKA ZA PROCENU STAVOVA FARMACEUTA I FARMACEUTSKIH TEHNIČARA U VEZI SA SAVETOVANJEM ŽENA REPRODUKTIVNE DOBI O ADEKVATNOM UNOSU FOLATA (A-FOL-PH)**

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Cilj ove studije bilo je ispitivanje konstruktne valjanosti i pouzdanosti skale kreirane s ciljem procene stavova farmaceuta i farmaceutskih tehničara u vezi sa savetovanjem žena reproduktivne dobi o adekvatnom unosu folata (A-FOL-Ph).

Sprovedenom studija preseka obuhvaćen je nacionalni stratifikovani uzorak farmaceuta i farmaceutskih tehničara zaposlenih u državnim i privatnim javnim apotekama u Srbiji (n=730). Upitnik je obuhvatao petnaest izjava sa pet nivoa slaganja po principu Likertove skale. S ciljem ispitivanja opravdanosti faktorske analize primenjeni su Bartlett-ov test sfericiteta i Kaiser-Meyer-Olkin (KMO) pokazatelj adekvatnosti uzorka. Za izdvajanje faktora primenjena je Analiza glavnih komponenti (AGK). Broj zadržanih faktora određen je na osnovu Kaiser-Guttman pravila i analize Dijagrama prevoja latentnih vrednosti uz primenu Cattell-ovog kriterijuma. Pre interpretacije faktora primenjena je kosougla Direct Oblimin rotacija. Za proveru pouzdanosti skale u celini i na nivou izdvojenih faktora korišćena je mera interne konzistencije izražena Cronbach-ovim  $\alpha$  koeficijentom.

Budući da je Bartlett-ov test sferičnosti dostigao statističku značajnost, a vrednost Kaiser-Meyer-Olkin (KMO) pokazatelja prevazišla preporučenu graničnu vrednost od 0.6 potvrđena je faktorabilnost korelacione matrice (KMO 0,807;  $\chi^2(91)=3317,70$ ,  $p<0,001$ ) i opravdanost AGK. Na osnovu kriterijuma svojstvenih vrednosti (eigenvalues) izdvojene su tri komponente, a uvidom u tačku preloma na dijagramu prevoja podržano je trofaktorsko rešenje. Faktori su označeni kao „reaktivan pristup pružanju informacija i saveta u vezi folne kiseline“, „uvažavanje javnozdravstvenog značaja perikonceptijske suplementacije folnom kiselinom“ i „stepen obaveštenosti i diseminacija informacija o folatima“. Doprinos navedenih faktora objašnjenju ukupne varijanse iznosio je 31,68%, 12,43% i 9,92%, redom. Vrednosti Cronbach-ovog  $\alpha$  koeficijenata za skalu u celini (0.817) i izdvojene faktore (0,816, 0,822 i 0,763) potvrdili su dobru internu konzistenciju upitnika.

Javne apoteke predstavljaju platformu velikog strateškog potencijala za promociju prekonceptijske nege i unapređenje svesti o značaju adekvatnog statusa folata. Naši rezultati ukazuju da je A-FOL-Ph validan i pouzdan instrument koji može doprineti istraživanju u ovoj oblasti.

# FACTOR ANALYSIS OF QUESTIONNAIRE EVALUATING ATTITUDES OF PHARMACISTS AND PHARMACY TECHNICIANS WITH REGARDS TO COUNSELLING WOMEN OF REPRODUCTIVE AGE ON ADEQUATE FOLATE INTAKE (A-FOL-PH)

**Milica Zeković<sup>1</sup>, Dušanka Krajnović<sup>2</sup>, Tatjana Stojković<sup>2</sup>,  
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The aim of the present study was to examine the construct validity and reliability of the scale designed to assess attitudes of pharmacists and pharmacy technicians towards counseling women of reproductive age on adequate folate intake (A-FOL-Ph).

Cross-sectional study was conducted among nationwide stratified sample (n=730) of pharmacists and pharmacy technicians, practicing in both private and state-owned community pharmacies in Serbia. Questionnaire comprised fifteen 5-level Likert-type items. To determine the suitability for factor analysis, the Bartlett Test of Sphericity and KMO (Kaiser-Meyer Olkin Measure of Sampling Adequacy) tests were used. Principal Component Analysis (PCA) was selected as factor extraction method. The number of retained factors was based on Kaiser-Guttman rule and the examination of Cattell's scree plot. Prior to interpretation oblique direct oblimin rotation was performed. Cronbach's alpha internal reliability coefficients were calculated for each factor and the total scale.

Bartlett's Test of Sphericity reached statistical significance and the KMO indicator exceeded the recommended value of 0.600, confirming the factorability of the correlation matrix and suitability for PCA (KMO 0.807;  $\chi^2(91)=3317.70$ ,  $p<0.001$ ). Based on eigenvalue criteria three components were revealed, and the point of inflexion displayed by the scree plot confirmed the adequacy of 3-factor solution. The components were labeled „reactive approach to folic-acid related counseling”, „acknowledgement of public-health importance of preconception folic acid supplementation” and „awareness and dissemination of folate-related information”. They accounted for 31.68%, 12.43% and 9.92% of the variance in the dataset, respectively. Cronbach's alpha coefficients for total scale (0.817) and extracted factors (0.816, 0.822 and 0.763) confirmed good internal consistency.

Community pharmacies provide strategically significant platform for preconception care promotion and raising awareness of the importance of adequate folate status. Our findings indicate that A-FOL-Ph is valid and reliable instrument that might contribute to research in this field

## **ZNANJE FARMACEUTA I FARMACEUTSKIH TEHNIČARA O FOLNOJ KISELINI I PREVENCIJI DEFEKATA NERVNE CEVI: EVALUACIJA UPEŠNOSTI EDUKATIVNE INTERVENCIJE**

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Cilj ove studije bila je procena učinka edukativnog programa na usvajanje i zadržavanje znanja o folatima među farmaceutima i farmaceutskim tehničarima.

Sprovedena je studija intervencije zasnovana na primeni pretest-posttest eksperimentalnog dizajna sa kontrolnom grupom u kojoj je učestvovalo 166 farmaceuta i farmaceutskih tehničara zaposlenih u javnim apotekama u Republici Srbiji. Ispitanici su po principu randomizacije podeljeni u eksperimentalnu (n=85) i kontrolnu grupu (n=81). Detaljan pregled literature i ekspertske konsultacije su primenjeni u procesu razvoja edukativnog programa. Test znanja je sproveden u početnoj tački studije (s ciljem potvrde ekvivalencije grupa), neposredno nakon edukacije (među ispitanicima eksperimentalne grupe) i nakon mesec dana. Test je obuhvatio pitanja sa više ponuđenih odgovora pri čemu je samo jedan tačan, a ukupan skor na testu znanja, koji predstavlja sumarnu vrednost za sva pitanja, imao je teorijski opseg od 0 do 13 poena.

Analize u početnoj tački studije potvrdile su odsustvo statistički značajnih razlika u znanju o folatima između eksperimentalne i kontrolne grupe ( $t(164)=0,356$ ,  $p=0,722$ ). Najveći broj ispitanika dao je 7 tačnih odgovora i niko nije ostvario teoretski maksimalan skor od 13 poena. Rezultati posttesta sprovedenog neposredno nakon predavanja ukazao je naznačajno unapređenje postignuća u grupi polaznika ( $6,54\pm 2,11$  vs.  $11,39\pm 1,48$ ,  $t(83)=25,955$ ,  $p<0,001$ ). Farmaceuti i farmaceutski tehničari, koji su prisustvovali obuci dominantno su ostvarivali 11, 12 i 13 poena (22, 23 i 22 ispitanika, redom) i svi su tačno odgovorili na više od 50% pitanja. Dodatno, naknadna evaluacija posle mesec dana ukazala je na visok stepen zadržavanja stečenih znanja ( $11,39\pm 1,48$  vs.  $11,14\pm 1,53$ ,  $t(83)=3,019$ ,  $p>0,05$ ). Suprotno tome, u okviru kontrolne grupe, razlika u ostvarenim rezultatima u početnoj i završnoj tački studije nije dostigla nivo statističke značajnosti ( $6,65\pm 1,97$  vs.  $6,81\pm 2,13$ ,  $t(80)=2,020$ ,  $p=0,067$ ).

Rezultati ove studije ukazuju da se razvijena edukativna intervencija pokazala uspešnom u unapređenju znanja članova farmaceutskog tima iz javnih apoteka o folatima i prevenciji defekata nervne cevi.

# COMMUNITY PHARMACISTS' AND PHARMACY TECHNICIANS' KNOWLEDGE OF FOLIC ACID AND NEURAL TUBE DEFECTS PREVENTION: EDUCATIONAL INTERVENTION EFFECTIVENESS EVALUATION

**Milica Zeković<sup>1</sup>, Dušanka Krajnović<sup>2</sup>, Tatjana Stojković<sup>2</sup>,  
Mirjana Gurinović<sup>1</sup>, Marija Glibetić<sup>1</sup>**

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The aim of this study was to evaluate educational program impact on folate-related knowledge acquisition and recall among pharmacists and pharmacy technicians

Experimental study using pretest-posttest control group design was conducted among 166 pharmacists and pharmacy technicians practicing in community pharmacies in Serbia. They were randomly assigned to either experimental (n=85) or control group (n=81). Experimental group received training on folic acid and neural tube defects prevention. Detailed literature review and expert consultation were employed in educational programme development. Knowledge test was administered at the study baseline (to validate knowledge equivalence between the two groups), immediately after the educational program (in the experimental group), and after one month. It comprised multiple-choice questions with a single correct answer and the total score, representing the summarized value for all the listed items, had a theoretical range from 0 to 13 points.

Baseline analyses confirmed the absence of statistically significant difference regarding folate-related knowledge between the experimental and control group ( $t(164)=0.356$ ,  $p=0.722$ ). The majority of participants gave 7 correct answers, and none reached the maximal theoretical score of 13 points. Results of the posttest administered immediately following the lecture indicated significant increase in knowledge scores among attendees ( $6.54\pm 2.11$  vs.  $11.39\pm 1.48$ ,  $t(83)=25.955$ ,  $p<0.001$ ). Pharmacists and pharmacy technicians who received the training predominantly achieved 11, 12 and 13 points (22, 23 and 22 respondents, respectively) and all answered correctly more than 50% of questions. Furthermore, follow-up assessment after one month revealed good retention of knowledge ( $11.39\pm 1.48$  vs.  $11.14\pm 1.53$ ,  $t(83)=3.019$ ,  $p>0.05$ ). In contrary, difference in baseline and end-point knowledge scores within control group did not reach statistical significance ( $6.65\pm 1.97$  vs.  $6.81\pm 2.13$ ,  $t(80)=2.020$ ,  $p=0.067$ ).

Findings suggest that novel educational intervention was effective in improving pharmacy staff knowledge regarding folates and neural tube defects prevention.

## SKRINING DEPRESIJE KOD TRUDNICA I ŽENA U POSTPARTALNOM PERIODU PRIMENOM EPDS SKALE – PILOT STUDIJA

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Perinatalna depresija je jedna od najčešćih maternalnih komplikacija. Edinburška skala postnatalne depresije (ESPD) je skrining test koji se u svetu koristi za procenu simptoma perinatalne depresije. Cilj rada bio je da se ispita učestalost simptoma depresije u populaciji trudnica i žena 12 meseci nakon porođaja u Beogradu.

U istraživanju je korišćen ESPD upitnik validiran za populaciju žena u perinatalnom periodu u Srbiji, radi prepoznavanja znakova i simptoma depresije. Podaci su prikupljeni tokom maja 2018. u Beogradu. Učešće u istraživanju bilo je anonimno, dobrovoljno i volonterski. Rezultati su evaluirani prema sledećim kategorijama vrednosti ukupnog skora: 0-8=niska verovatnoća za pojavu depresije, 8-12=pacijentkinja se suočava sa novim načinom života, 13-14=prisutni znakovi depresije, koji zahtevaju preventivne mere, >15 velika verovatnoća za ispoljavanje simptoma kliničke depresije.

Istraživanje je obuhvatilo ukupno 60 ispitanica. Rezultati su pokazali sledeću zastupljenost ispitanica u navedenim kategorijama rizika: 0-8=36,6%, 8-12=33,3%, 13-14=16,7%,>15=13,4%. Perinatalna depresija i drugi poremećaji raspoloženja se mogu pogoršati u toku trudnoće i nakon porođaja i tako uticati na mortalitet i morbiditet žena i njihove dece. Perinatalna depresija često prođe neprepoznata jer se poremećaji spavanja, apetita i libida mogu dovesti u vezu sa trudnoćom i porođajem. U skladu sa navedenim, kao i u odnosu na pokazanu relativno visoku zastupljenost simptoma depresije u ispitavanoj populaciji, veoma je važno sprovesti redovnu procenu simptoma depresije kod žena u perinatalnom periodu. Na taj način bi bilo moguće prepoznati žene sa visokim rizikom za razvoj depresije te ih blagovremeno uputiti na odgovarajući klinički pregled. Time bi se značajno doprinelo smanjenju komplikacija depresije. S obzirom da je u pitanju skrining metod, ESPD skala se uspešno primenjuje i kroz farmaceutske praksu u apotekama. Relativno visoko zastupljena učestalost simptoma depresije kod žena u trudnoći i nakon porođaja poziva na neophodnu dodatnu edukaciju zdravstvenih radnika, ali i pacijentkinja, kao i uvođenje redovnog skrininga, u cilju pravovremenog postavljanja dijagnoze i adekvatnog lečenja.

# DEPRESSION SCREENING FOR PREGNANT WOMEN AND WOMEN IN THE POSTPARTUM PERIOD USING THE EPDS SCALE- A PILOT STUDY

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Perinatal depression is one of the most common maternal complications. The Edinburgh scale of postnatal depression (ESPD) is a screening test used worldwide to assess the symptoms of perinatal depression. The aim of the study was to examine the frequency of depression symptoms in Belgrade in the pregnant and women population 12 months after delivery.

The study used an ESPD questionnaire validated for women in the perinatal period in Serbia to identify signs and symptoms of depression. The data was collected during May 2018 in Belgrade. Participation in the research was anonymous, voluntary and volunteer. The results are evaluated according to the following categories in the total score: 0-8 = low probability of depression, 8-12 = the patient faces a new way of life, 13-14 = present signs of depression requiring preventive measures, > 15 high probability of manifesting symptoms of clinical depression.

The survey covered a total of 60 respondents. The results showed the following representation of subjects in these risk categories: 0-8 = 36.6%, 8-12 = 33.3%, 13-14 = 16.7%, > 15 =13.4%. Perinatal depression and other mood disorders can worsen during pregnancy and after delivery, and thus affect the mortality and morbidity of women and their children. Perinatal depression often passes unrecognized because sleep, appetite and libido disorders can be linked to pregnancy and child birth. In accordance with the above, as well as in relation to the relatively high prevalence of symptoms of depression in the examined population, it is very important to carry out a regular assessment of the symptoms of depression in women in the perinatal period. In this way it would be possible to identify women with a high risk of developing depression, and we will be able to refer them to an appropriate clinical examination. This would significantly contribute to the reduction of complications of depression. Since it is a screening method, ESPD scale is successfully applied through pharmacy practice in pharmacies.

The relatively high frequency of depression symptoms in women during pregnancy and after birth, calls for the necessary additional education of healthcare workers, as well as the patient, as well as the introduction of regular screening, with the goal of timely diagnosis and adequate treatment.

## ISPITIVANJE FAKTORA RIZIKA ZA RAZVOJ OSTEOPOROZE U POPULACIJI ŽENA

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Osteoporozna je najzastupljenije sistemsko metaboličko oboljenje koštanog sistema. Faktori rizika za razvoj osteoporoze se mogu podeliti na promenljive i nepromenljive. Farmaceuti u javnim apotekama su u prilici da sakupe podatke od pacijenata i utvrde prisustvo faktora rizika za razvoj osteoporoze. Cilj ovog rada je utvrđivanje prisustva faktora rizika i procena znanja mladih žena o osteoporozi.

Istraživanje je sprovedeno u Apoteci Beograd tokom maja 2018. godine. U apotekama su anketirane ženestarosti od 18 do 45 godina. Ispitanice su zamoljene da popune upitnik koji se sastoji iz dva dela: deo koji ispituje prisustvo faktora rizika i deo koji procenjuje nivo znanja o osteoporozi.

U istraživanju je učestvovalo 73 žena prosečne starosti 35,6 godina i prosečne vrednosti indeksa telesne mase ITM=22,4 kg/m<sup>2</sup> (16,2% žena je imalo ITM<18,5 kg/m<sup>2</sup>). Samo je jedna žena bila u menopauzi. Kod nekih žena su bili prisutni nasledni faktori (fraktura kuka kod majke/bake (17,8%); prisutna pogrbljenost kod roditelja (19,2%); osteoporozna kod roditelja (15,1%)). Kod više žena utvrđeno je prisustvo faktora povezanih sa životnim navikama (35,6% ne praktikuju fizičku aktivnost; 49,3% vodi sedentarni način života; 19,2% su pušači; 24,7% ne konzumira mlečne proizvode). Od bolesti udruženih sa osteoporozom zabeležene su: problemi sa vidom (35,6%), hipertireoidizam (11,0%), terapija kortikosteroidima (5,5%) i reumatoidni artritis (4,1%). Prosečna ocena na testu koji ispituje znanje o osteoporozi bila je 4,1 (na skali od 1 do 8). Samo je jedna žena odgovorila tačno na sva pitanja.

Faktori rizika povezani sa životnim stilom su najzastupljeniji u odabranoj populaciji žena. Sa druge strane jedino na ove faktore se i može uticati. Znanje žena o osteoporozi je takođe veoma skromno. Na osnovu toga, farmaceuti u apotekama savetovanjem žena mogu imati važnu ulogu u prevenciji promenljivih faktora rizika za razvoj osteoporoze.

## **THE ANALYSIS OF OSTEOPOROSIS RISK FACTORS IN FEMALE POPULATION**

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Osteoporosis is the most prevalent metabolic bone disease. Osteoporosis risk factors can be divided inmodifiable and non-modifiable. Pharmacists in community pharmacies are able to collect data from women and to identify osteoporosis risk factors. The aim of this study was to analyze osteoporosis risk factors present in young female population.

The research was conducted during May 2018 year in Community Pharmacy Belgrade. Risk factors and osteoporosis knowledge were examined using the questionnaire. The questionnaire was consisted of two parts: for the osteoporosis risk factor detection and osteoporosis knowledge assessment. The questionnaires were disseminated in pharmacies to women 18-45 years of age.

The study included 73 female participants. The women were old 35.6 years and with BMI=22.4 kg/m<sup>2</sup> in average (16.2% women had BMI<18.5kg/m<sup>2</sup>). Only one woman was in menopause. Hereditary factors were present in some woman (hip fracture of mother/grandmother (17.8%); parents with hunchback (19.2%); parents with osteoporosis (15.1%)). Factors associated with lifestyle were present in more women (35.6% no physical activity, 49.3% sedentary lifestyle, 19.2% smokers; 24.7% didn't take dairy products). Illnesses associated with osteoporosis were present in women with: visual problems (35.6%), hyperthyroidism (11.0%), who takes corticosteroids (5.5%) and rheumatoid diseases (4.1%). The average score on the osteoporosis knowledge test was 4.10 on a scale from 1 to 8. Only one woman correctly answered on all questions.

The lifestyle risk factors were the most common in the selected female population. On the other side, these are the only factors that can be edited. Knowledge of women about osteoporosis was also modest. The pharmacists can play important role in prevention of modifiable risk factors in female population.

## **POZNAVANJE I PRIMJENA KONTRACEPTIVNIH METODA U PERIODU ADOLESCENCIJE**

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Upotreba kontraceptivnih metoda u periodu adolescencije je od suštinskog značaja u prevenciji nastanka: neželjene trudnoće, polno prenosivih bolesti i mogućih komplikacija vezanih za opšte i reproduktivno zdravlje pojedinca. Cilj ovog rada bio je ispitati nivo znanja i primjene kontraceptivnih metoda među populacijom učenika, na nivou srednjih škola u Podgorici.

Deskriptivnim epidemiološkim ispitivanjem, obuhvaćeno je ukupno 196 učenika (uzrasta 17-19 godina). Istraživanje je sprovedeno među učenicima srednje Medicinske škole i Gimnazije u Podgorici. Kao instrument u istraživanju korišćen je standardizovani upitnik (16 pitanja). Anketiranje je sprovedeno u periodu april-maj, tokom 2018. godine.

Od ukupnog broja anketiranih, 73% ispitanika je bilo ženskog, a 27% muškog pola, prema čemu je bilo dominantno učešće pripadnica ženskog pola. 28,7% ispitanika se izjasnilo da koristi neki vid kontracepcije, i to mnogo češće pripadnici muškog pola (56,6%). Na predlog lekara, kontraceptivne metode je koristilo svega 16,8% ispitanika. Uglavnom su svi ispitanici, poznavali minimum jednu kontraceptivnu metodu i to, upotrebu kondoma (95%), anti-bebi pilule (72%), pilula za dan poslije (62%) i spiralu (61%). Pripadnice ženskog pola, kao izvor informacija navode stručnu literaturu i internet (55%), dok pripadnici muškog pola informacije dobijaju od svojih roditelja (52,8%) i/ili prijatelja (47,2%). Da se upotrebom kondoma može spriječiti prenos polno prenosivih bolesti i neželjena trudnoća, odgovorilo je oko 90% ispitanika. Zabrinjavajući je podatak, da 38% ispitanika, smatra da se upotrebom oralnih kontraceptiva može spriječiti prenos polno prenosivih bolesti (50% muškog i 34% ženskog pola). 80,6% ispitanika je potvrdno odgovorilo na pitanje o upotrebi oralnih kontraceptiva u prevenciji nastanka neželjene trudnoće. Tačne odgovore na postavljena pitanja o oralnim kontraceptivima i njihovom negativnom uticaju na zdravlje žena, dalo je više od polovine ispitanika.

Rezultati sprovedene studije ukazuju da je anketiranim srednjoškolcima neophodno uvođenje dodatnih edukativnih sadržaja o dostupnim metodama kontracepcije, a u cilju unapređenja znanja i očuvanja zdravlja adolescenata.

## THE KNOWLEDGE AND USE OF CONTRACEPTIVE METHODS AMONG ADOLESCENTS

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The use of contraceptive methods in the adolescent period is essential in preventing the emergence of unwanted pregnancies, sexually transmitted diseases and possible complications related to the general and reproductive health of an individual. The aim of this paper was to examine the level of knowledge and use of contraceptive methods among the student's population at the level of secondary schools in Podgorica.

Descriptive epidemiological study, included a total of 196 students (17-19 years old). The research was conducted among the students of the Secondary Medical School and the Gymnasium in Podgorica. The standardized questionnaire was used as an instrument in this research (16 questions). The survey was conducted in the period April-May, during 2018.

Of the total number of respondents, 73% of the respondents were female and 27% male, indicating the dominant participation of female participants. 28.7% of respondents pleaded to use some type of contraception, and more often in male members (56.6%). At the proposal of a physician, 16.8% of respondents used some contraceptive methods. In general, all respondents knew at least one contraceptive method, including condom use (95%), contraceptive pills (72%), a pill for the day after (62%) and spiral (61%). Females as the source of information use professional literature and the Internet (55%), while men receive information from their parents (52.8%) and/or friends (47.2%). Approximately 90% of respondents answered that condom use could prevent the transmission of sexually transmitted diseases and unwanted pregnancies. It is a worrying fact, that 38% of respondents consider using oral contraceptives to prevent transmission of sexually transmitted diseases (50% males and 34% females). 80.6% of respondents confirmed the question about the use of oral contraceptives in preventing the occurrence of unwanted pregnancy. Correct answers to questions about oral contraceptives and their negative impact on women's health gave more than half of respondents.

The results of the conducted study indicate the need to introduce additional educational content on available methods of contraception for secondary school students in order to improve knowledge and preserve the health of adolescents.

## **ZNANJE, STAVOVI I UPOTREBA HITNE KONTRACENCIJE NA TERITORIJI GRADA BEOGRADA - DA LI SE NEŠTO PROMENILO NAKON DONOŠENJA STRATEŠKIH DOKUMENATA**

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Očuvanje reproduktivnog zdravlja od velikog je značaja, te su u Republici Srbiji doneti strateških dokumenti, Nacionalna strategija za mlade za period 2015-2025. i Nacionalni program očuvanja i unapređenja seksualnog i reproduktivnog zdravlja (decembar 2017). Hitna kontracepcija (HK) predstavlja jednu od važnih mera za očuvanje reproduktivnog zdravlja. Cilj istraživanja bio je da se ispituju razlike u znanju, stavovima i upotrebi HK u periodu pre i nakon donošenja navedenih dokumenata.

Podaci su prukupljeni putem upitnika koje su građani reproduktivnog doba (15-49 godina) popunjavali dobrovoljno i anonimno, u apotekama Apoteke Beograd tokom dva dvomesečna (maj-jun) perioda, 2014 i 2018. godine.

Ukupan broj ispitanika bio je 122. Prosečna starost ispitanika bila je veća u prvom ispitivanom periodu,  $37 \pm 9,7$  prema  $34,93 \pm 7,8$  godina, dok je manji broj njih bio u braku, 47% prema 52%, i imao polne odnose u poslednjih godinu dana, 70% prema 87%. Smanjen je broj ispitanika koji su za HK čuli od farmaceuta, 25% prema 19%, a povećan broj njih koji su za HK čuli od lekara, 3% prema 23%. Povećan je broj ispitanika koji su znali kako HK postiže svoj efekat, 27% prema 34%, i broj ispitanika koji su znali vremenski okvir za primenu HK, 40% prema 53%. Sličan broj znao je koliki je nivo efikasnosti HK, 22% prema 19%, a smanjen je broj onih kojima je poznato da su neželjeni efekti HK manji u odnosu na redovnu kontracepciju, 13% prema 5%. Upotreba HK je povećana, 23% prema 29%, ali je smanjen broj onih koji bi HK preporučili drugima, 45% prema 39%.

Iako je uočeno izvesno povećanje znanja o HK i dalje je ukupni nivo znanja relativno nizak, te su dalje mere za unapređenje u ovoj oblasti neophodne. U skladu sa snabdevanjem HK isključivo preko apoteka, farmaceuti mogu dati značajan doprinos u ovoj oblasti.

## **KNOWLEDGE, ATTITUDES AND USE OF EMERGENCY CONTRACEPTION - HAVE ANYTHING CHANGED AFTER ADOPTION OF STRATEGIC DOCUMENTS**

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Preservation of reproductive health is of great importance, and in the Republic of Serbia, strategic documents have been adopted, the National Youth Strategy for the period 2015-2025, and the National Program for Preservation and Promotion of Sexual and Reproductive Health (December, 2017). Emergency contraception (EC) is one of important measures for preservation of reproductive health. The aim of the research was to examine differences in knowledge, attitudes and use of EC in period before and after adoption of denoted documents.

The data were collected through questionnaires filled in by population of reproductive age (15-49 years), voluntarily and anonymously, in pharmacies of Pharmacy „Belgrade”, in two, two-months (May-June) periods of time, in 2014 and 2018.

The total number of participant was 122. The average age of respondents was higher in the first study period,  $37 \pm 9.7$  versus  $34.93 \pm 7.8$  years, while fewer were married, 47% vs. 52%, and had full relationships in the last year, 70% vs. 87%. The number of respondents who heard about EC from pharmacists was reduced, 25% vs. 19%, but the number of those who heard about it from the doctor was increased, 3% vs. 23%. The knowledge about EC mechanism of action was increased from 27% to 34%, similar to knowledge about timeframe for the application, from 40% to 53%. Knowledge related to EC efficiency level slightly decreased, from 22% to 19%, but knowledge about adverse effects significantly decreased, 13% versus 5%. The number of EC users was increased, 23% vs. 29%, but the number of those who would recommend it to others was reduced, 45% from 39%.

Although some increase in knowledge about EC has been noticed, the overall level of knowledge is relatively low. Accordingly, more efforts for improvement in this area are necessary. In accordance with the supply of EC exclusively through pharmacies in Serbia, pharmacists can make a significant contribution in this field.

## **THE PHARMACY- FRIEND OF BREASTFEEDING**

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ZU Ljekarna Bjelovar (Croatia)

With long-standing active participation in the marking of the National Breastfeeding Week and the International Breastfeeding Week, providing a special area for breastfeeding and changing children and active education of pharmacists, the Bjelovar Pharmacy has become a friend of breastfeeding. Pharmacists from Bjelovar Pharmacy have been working successfully with specialist pediatric clinics, pediatric department of the General Hospital of Bjelovar and the Breastfeeding Groups for many years and have become an active member of the promotion of breastfeeding and nursing care for mothers and children.

The goal of joint co-operation with a pediatrician and nurse is to improve the health care of children and mothers and to detect the most common problems faced by young mothers. With good and successful co-ordination, a pharmacist and a doctor can be of great help to the patient and provide him with the best possible health care.

The study included mothers and children attending the Breastfeeding Group, who had given consent to use the data. Therapy and comorbidity data and basic laboratory findings were collected through medical records and through discussions with users and medical staff of a specialist clinic. In the period between October 2016 and May 2018, 75 mothers and 76 children participated in the breastfeeding and counseling groups.

Protection, promotion and support of breastfeeding is an important public health priority of all countries, which is why Croatia's Health Strategy 2012-2020 program of breastfeeding is an important task. By organizing a professional meeting on „Mother and child care – reflecting social maturity” - The role of the pharmacist in promoting breastfeeding in Bjelovar, by active participation in breastfeeding support groups and breastfeeding counseling and the launching of the mothers and children counseling center within the pharmacy, the pharmacist proved to be an inevitable active member of the health system.

## **AGEING OF THE POPULATION - THE NECESSITY FOR ACTION**

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Ageing of the society became a significant issue and it urges action to create settings in which quality of life of elderly could be improved. The aim of the study was to examine variety of conducted health projects involving elderly chronic patients, and to determine characteristics, duration and the current status of conducted projects.

A review of PubMed database was performed using following keywords: age, elderly, social care, health care, research project. Inclusion criteria: articles in English language, in journals addressing pharmaceutical, medical, aging, gerontological, health promoting themes; describing protocol or intervention published in the period from 2012 until 2017 year. Qualitative and quantitative studies included. Exclusion criteria: publications prior to the year 2012, themes not related to healthcare and ageing, articles not written in English language. Altogether 242 articles met wanted requirements, presenting themes relevant to elderly: longevity, depression, myocardial infarction, dementia. Articles that presented projects addressing elderly suffering from chronic conditions or describing their specific need regarding their age were 48. Among these articles six presented study protocols for the projects.

The number and variety of projects indicate the complexity of ageing of the society and the problems that should be investigated through multidisciplinary approach of clinical, behaviour and health sciences.

## **PRUŽANJE USLUGE SAVETOVANJA STARIJIH PACIJENATA O PRIMENI LEKOVA – STAVOVI FARMACEUTA**

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Pacijenti starije životne dobi primenjuju uglavnom veliki broj lekova. Tokom procesa izdavanja lekova i savetovanja pacijenata farmaceuti mogu značajno da doprinesu racionalnoj upotrebi lekova. Cilj ovog istraživanja bio je da se ispituju stavovi farmaceuta o uslugama savetovanja starijih pacijenata o primeni lekova.

Istraživanje je sprovedeno tokom 2018. godine u više lanaca apoteka u Srbiji uz pomoć namenski kreiranog on-line upitnika. Upitnike su popunjavali samo farmaceuti.

U istraživanju je učestvovalo 154 farmaceuta, pretežno ženskog pola (87,1%), prosečne starosti 38,3 godina i radnog staža 12,8 godina. Kada su u pitanju informacije o lekovima, pacijenti najviše veruju lekarima specijalistima (39,6%), farmaceutima (31,2%), lekarima opšte prakse (18,8%), i ljudima iz njihovog okruženja (10,4%). Farmaceuti najčešće pružaju informacije o upotrebi lekova (100,0%), indikacijama za upotrebu lekova (91,6%), dužini primene leka (77,9%), interakcijama sa hranom i lekovima (72,7%) i neželjenim reakcijama na lek (53,2%). Gužva u apoteci je najčešća (73,6%) barijera za adekvatno savetovanje pacijenata prepoznata od strane farmaceuta. Oko polovine farmaceuta (51,6%) smatra da usluga savetovanja starijih pacijenata treba da bude plaćena.

Farmaceuti imaju jasan stav da je usluga savetovanja starijih pacijenata o primeni lekova od velikog značaja za kvalitet zdravstvene zaštite. Ovakva vrsta analize može pružiti smernice kako da se razviju farmaceutske usluge i kako da se implementiraju u svakodnevnoj praksi.

# **PROVISION OF PHARMACEUTICAL SERVICE TO ELDERLY PATIENTS ABOUT SAFE USE OF MEDICINES - THE ATTITUDES OF PHARMACISTS**

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Elderly patients mostly use a large number of medicines. Pharmacists can contribute significantly to the rational use of medicines during the process of dispensing medicines and patient counseling. The aim of this study was to examine the attitudes of pharmacists about the services of counseling elderly patients on the safe use of medicines.

The study was conducted in 2018 within several pharmacy chains in Serbia using on-line questionnaire designed for this research. The questionnaires were filled out only by pharmacists.

The study included 154 pharmacists, mostly female (87.1%), aged 38.3 years and 12.8 years of service in average. When it comes to information on medicines, patients mostly trust physicians (39.6%), pharmacists (31.2%), general practitioners (18.8%) and friends (10.4%). Pharmacists often provide information on medicines use (100.0%), indications (91.6%), duration of administration (77.9%), medicines interactions with food and other medicines (72.7%) and adverse drug reactions (53.2%). The most common barrier for adequate counseling of patients recognized by pharmacist was crowded pharmacy (73.6%). About half of pharmacists (51.6%) think that elderly patient counseling services should be paid.

Pharmacists think that the counseling service of elderly patients about safe use of medicines is of great importance for the quality of health care. This type of analysis can provide guidance on how to develop and implement pharmaceutical services.

## STAVOVI PACIJENATA I UPOTREBA LEKOVA BEZ LEKARSKOG RECEPTA NA TERITORIJI GRADA BEOGRADA –ANALIZA PROMENA I TRENDOVA

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Preporuka za lečenje blažih zdravstvenih tegoba i savetovanje za upotrebu lekova koji se izdaju bez lekarskog recepta je obaveza farmaceuta. Ovo istraživanje urađeno je sa ciljem da se uporede stavovi pacijenata i upotreba BR lekova u 2014. i 2018. godini.

Istraživanje sa pacijentima Apoteke Beograd sprovedeno 2014. godine ponovljeno je u maju 2018. godine prateći istu metodologiju. U istraživanju je korišćen isti upitnik kreiran za potrebe ovog istraživanja. Pacijenti su samostalno i dobrovoljno popunjavali upitnik.

U ponovljenom istraživanju učestvovao je veći broj pacijenata (90 vs. 57) starije životne dobi ( $\bar{x}=65,7\pm 16,5$  vs.  $\bar{x}=47,6\pm 17,2$  godina). Veći broj pacijenata bio je ženskog pola (57,8% vs. 38,6%) sa manjom zastupljenošću hroničnih bolesti (30,0% vs. 42,1%). I dalje najveći procenat pacijenata kupuje BR lekove jednom mesečno ili češće (46,7% vs. 50,9%). Uticaj farmaceuta na izbor leka opao je tokom ovog perioda (36,7% vs. 57,1%), dok je uticaj lekara povećan (38,9% vs. 32,1%). Kao i u prethodnom istraživanju pacijenti su najčešće koristili BR lekove za bolove i probleme digestivnog trakta. Takođe, BR lekove se najčešće koriste na prvi znak bolesti, a najređe ako je bolest veoma ozbiljna. U oba istraživanja najveći broj pacijenata smatrao je da BR lekovi ne dovode do ozbiljnih neželjenih reakcija (57,8% vs. 42,1%) i da su potpuno bezbedni za upotrebu (56,7% vs. 43,9%).

Ponovljeno istraživanje pokazalo je da pacijenti manje koriste BR lekove u odnosu na prethodni period. Uticaj farmaceuta na izbor leka je smanjen za razliku od uticaja lekara. Dalja istraživanja bi trebalo da se baziraju na detaljnije ispitivanje da li pacijenti imaju bolju zdravstvenu pismenost ili se poverenje u farmaceute smanjuje kada je u pitanju izbor BR leka.

## **ATTITUDES OF PATIENTS AND USAGE OF NON-PRESCRIPTION MEDICINES IN BELGRADE – CHANGES OVER THE LAST FOUR YEARS**

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Recommending effective minor ailment treatments and using non-prescription medicines (NPM) is a pharmacist's duty. The aim of this study was to compare results of the studies about patients' attitudes and NPM use conducted in 2014 and 2018 year.

The research conducted in 2014 year was repeated in 2018 year using the same self-administered questionnaire and methodology.

More patients participated in the repeated research (90 vs. 57). They were older ( $\bar{x}=65.7\pm 16.5$  vs.  $\bar{x}=47.6\pm 17.2$  year), mostly female gender (57.8% vs. 38.6%) and with less chronically diseases (30.0% vs. 42.1%) compared to the results of the previous research. Still, the most patients buy the NPM once a month or more often (46.7% vs. 50.9%). The influence of the pharmacists in the NPM selection was lesser (36.7% vs. 57.1%) while the influence of the doctors was bigger (38.9% vs. 32.1%). As in the previous research, patients mostly use NPM for pain and gastro-intestinal problems. Also, the most of the patients use the NPM at the first sign of illness and the least if the disease is very serious. In both researches the most patients think that NPM can not cause serious adverse drug reactions (57.8% vs. 42.1%) and that NPM are safe medicines (56.7% vs. 43.9%).

The repeated research indicated that patients use less NPM medicines. The influence of the pharmacists in NPM choice was reduced unlike the influence of the doctors. Further research should examine the NPM use with the aspects of health literacy of the patients and patients' confidence in their pharmacists.

## EVALUACIJA PRUŽANJA FARMACEUTSKIH USLUGA U APOTECI BEOGRAD

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U dinamičnom okruženju apotekarske prakse poznata je činjenica da se uloge i aktivnosti farmaceuta menjaju. Samim tim drugačije su odgovornosti i zaduženja farmaceuta i uočava se potreba za analizom zdravstvenih usluga koje pružaju farmaceuti u javnim apotekama. Cilj istraživanja je strukturirana evaluacija pružanja farmaceutskih usluga u apotekama primarne zdravstvene zaštite.

Istraživanje je sprovedeno u periodu maj-jun 2018. godine u Apoteci „Beograd” (AB). Kao alat za prikupljanje podataka korišćen je upitnik za ispitivanje načina pružanja farmaceutskih usluga (*Behavioral Pharmaceutical Care Scale, BPCS*) koji se sastoji iz dva dela. Deo A ispituje demografske podatke i usluge koje pružaju farmaceuti. Deo B sadrži pitanja grupisana u 3 dimenzije: „aktivnosti koje su direktno u vezi sa pacijentima”, „aktivnosti konsultovanja i upućivanja pacijenata” i „instrumentalne aktivnosti”. On line upitnik je prosleđen svim apotekama AB.

U istraživanju je učestvovalo 59 farmaceuta, pretežno ženskog pola (91,5%) i prosečnog radnog staža 19,6 godina. Akademске specijalističke studije je završilo oko četvrtina ispitanika. Prosečan broj farmaceuta i farmaceutskih tehničara po apoteci iznosio je 4,4 odnosno 2,6. Prostor za konsultacije posedovalo je 45,7% apoteka. Prosečan rezultat i procenat od maksimalnog rezultata za svaku od tri dimenzije B dela upitnika iznosili su: za aktivnosti koje su direktno u vezi sa pacijentima 30,8 (36,2%), za aktivnosti konsultovanja i upućivanja pacijenata 28,1 (62,5%) i za instrumentalne aktivnosti 25,8 (64,7%). Ukupan prosečan BPCS rezultat iznosio je 84,3 (51,1%). Detaljnija analiza pojedinačnih usluga (ili domena) može da ukaže na usluge koje treba da se unaprede i da pruži smernice za dalji razvoj farmaceutskih usluga u cilju unapređenja rada sa pacijentima.

Ispitivani farmaceuti pružaju većinu farmaceutskih usluga definisanih u BPCS-upitniku. Daljim analizama koje će obuhvatiti poređenje rezultata iz ostalih javnih apoteka, biće omogućeno stvaranje još bolje osnove za unapređenje rada farmaceuta u svakodnevnim aktivnostima u apoteci.

# **ANALYSES OF THE PHARMACEUTICAL CARE SERVICES PROVIDED BY COMMUNITY PHARMACISTS WITHIN THE PHARMACY BELGRADE**

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In the dynamic environment of pharmacy practice, the responsibilities and duties of pharmacists are changing, and the analysis of pharmaceutical services is needed. The aim of the research is a structured evaluation of the provision of pharmaceutical services in community pharmacies.

The research was conducted in the period May-June 2018 in community pharmacy chain - Pharmacy Belgrade (PB). As data collection tool the Behavioral Pharmaceutical Care Scale (BPCS) was used. The questionnaire consists of two parts. Part A examines demographic data and services provided by pharmacists. Part B contains questions grouped in 3 dimensions: „direct patient care activities”, „referral and consultation activities” and „instrumental activities”. The online BPCS questionnaire was forwarded to all pharmacies within PB.

The research included 59 pharmacists, mostly female (91.5%) with average work experience of 19.6 years. Academic specialist studies completed about a quarter of respondents. The average number of pharmacists and pharmacy technicians per pharmacy was 4.4 and 2.6 respectively. Private patient consultation areas were present in 45.7% pharmacies. The average score and percentage of the maximum achievable score for each of the three dimensions of the questionnaire’s B part were: for the direct patientcare activities 30.8 (36.2%), for the referral and consultation activities 28.1 (62.5 %) and for the instrumental activities 25.8 (64.7%). The overall average BPCS score was 84.3 (51.1%). A more detailed analysis of particular services (or domains) can point to services that need to be improved and provide guidelines for the further development of pharmaceutical services in order to improve work with patients.

Pharmacists provide most of the pharmaceutical services defined in the BPCS questionnaire. Comparison of these results with results of other community pharmacies could enable further improvement of pharmaceutical care services.

## **ANALIZA POZIVA UPUĆENIH CENTRU ZA INFORMACIJE O LEKOVIMA APOTEKE BEOGRAD**

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Fokus sprovedenog istraživanja je bio na utvrđivanju glavnih razloga zbog kojih se pacijenti obraćaju na telefon Centra za informacije o lekovima „Apoteke Beograd”, tj. u kolikoj meri se javljaju zbog pitanja snabdevenosti apoteka lekovima koje koriste, a kakva je struktura preostalih postavljenih pitanja, koja se ne tiču deficitarnosti. Metodologija istraživanja je obuhvatila beleženje, klasifikaciju i analizu svih telefonski postavljenih pitanja i odgovora u periodu od aprila 2017. do marta 2018.godine.

Obradom svih 10964 poziva uk kojima je postavljeno 13139 pitanja (1,2 po pozivu) i njihovom klasifikacijom, utvrđeno je: postavljeno je 9042 pitanja u vezi sa trenutnim stanjem snabdevenosti apoteka (68,82%), a od toga 6939 pitanja se odnosilo na registrovane lekove, dijetetske proizvode i medicinska sredstva (76,74%), 435 pitanja na lekove sa D liste (4,81%) i 1668 pitanja na neregistrovane lekove u Srbiji (18,45%). Registrovanih poziva iz unutrašnjosti i inostranstva je bilo 665 (6,06%), a osim pacijenata, pitanja su postavljali i drugi zdravstveni radnici (lekari, stomatolozi i farmaceuti iz drugih apotekarskih lanaca) i to u 443 slučaja (4,04%). U okviru odgovora koji se ne odnose na snabdevenost (4097), ustanovljena je zastupljenost sledećih podgrupa: informacije o pravilnoj primeni leka (doza, interval doziranja, efekti leka, neželjena dejstva i potencijalne interakcije leka sa drugim supstancama i način čuvanja leka) i saveti o lakšim medicinskim problemima (29,51%), dostupne direktne i terapijske paralele lekova (21,04%), cena leka (17,16%), uslovi izdavanja leka na trošak fonda zdravstvenog osiguranja (14,16%), magistralna izrada leka (8,05%), upućivanje na druge institucije (4,95%)

Mogućnost informisanja putem telefona predstavlja pristupačan način pacijentima da dobiju više objedinjenih informacija na jednom mestu. U daljim istraživanjima potrebno je istražiti i druge komunikacione kanale za ovakvu vrstu pružanja informacija o lekovima, usmerenu ka pacijentima.

## **PHARMACY BEOGRAD - ANALYSIS OF CALLS REFERRED TO THE DRUG INFORMATION CENTER**

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The focus of this research was to determine the primary reason for patient-initiated calls to The Drug Information Centre of „Apoteka Beograd”, ie, how often they call asking about the issue of drug supply and what is the structure of the remaining questions which do not concern drug shortage. Research methodology was based on recording, classification and analysis of all phone queries in the period of April 2017. to March 2018.

By processing and classification all of the 10904 calls with 13139 questions (1.2 by a call) the following was found: there were 9042 questions related to the current state of pharmacy supply (68.82%), of which 6939 questions related to registered medicines, dietary products and medical devices (76.74%), 435 questions of drugs from the D list (4.81%) and 1668 questions about drugs with no marketing authorisation in Serbia (18.45%); there were 665 (6.06%) registered calls from inside and abroad. In addition to patients, other health professionals (doctors, dentists and pharmacists from pharmacy chains) also asked questions in 443 cases (4.04%).

Analyzing the content of remaining questions that do not concern drug deficiency (4097), we found that patients were informed about: the correct administration of the drug (dosage, dosing interval, effects of the drug, adverse effects and potential drug interactions with other substances, storage and handling) and advice on minor medical problems (29.51%), interchangeable medicines and therapeutic options (21.04%), drug price (17.16%), health insurance coverage (14.16%), compounding (8.05%), referral to other institutions (4.95%).

Possibility of getting information by phone gives a comfortable way for patients to get integrated information at one spot. In further research, other communication channels for this kind of patient-oriented drug information delivery need to be explored.

## EVIDENTIRANJE FARMACEUTSKIH USLUGA U APOTECI SUBOTICA

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Sve usluge koje pružaju farmaceuti u cilju podrške pružanju farmaceutske zdravstvene zaštite predstavljaju farmaceutske usluge. Pored osnovne uloge snabdevanja lekovima i medicinskim sredstvima i ostalim proizvodima za zaštitu zdravlja, farmaceutske usluge uključuju i pružanje informacija o lekovima, savetovanje, edukaciju i komunikaciju sa pacijenatima/korisnicima usluga kako bi se unapredilo njihovo zdravlje i kvalitet života.

U Apoteci Subotica vrši se evidentiranje 32 klasifikovane farmaceutske usluge i koje su implementirane u postojeći softver. Ovo je jedna od jedinstvenih farmaceutskih aktivnosti koja je uvedena krajem 2016. godine kao pilot projekat, a krajem 2017. godine je počelo evidentiranje u svim ograncima Apoteke Subotica. Pacijent/korisnik usluga uz fiskalni isečak dobija i nefiskalni dodatak na kojem je zabeležena vrsta pružene usluge.

U periodu od decembra 2017. do februara 2018., evidentirano je ukupno 4387 pruženih farmaceutskih usluga. Najveći broj usluga se odnosi na davanje saveta deci, trudnicama i osobama starijim od 65 godina (N= 1825), savetovanje o načinu primene leka (N=1645), savetovanje o novoj propisanoj terapiji (N=229), sprečavanje lek-lek interakcija (N= 227), lek-hrana interakcija (N=219), savetovanje o pravilnom čuvanju i odlaganju lekova (N=165), dat savet prilikom izdavanja medicinskog sredstva (N=99), dat savet o sporednom dejstvu leka (N=73), sprečavanje duplikacije terapije (N=70), savetovanje o adherenci (N=51). Farmaceutske usluge koje se odnose na savetovanje o zdravom načinu života (N=45), savetovanje u cilju prevencije hroničnih bolesti (N=59) i o prestanku pušenja (N=11) su usluge koje se odnose na preventivne aktivnosti farmaceuta u apotekama.

Evidentiranjem farmaceutskih usluga ističe se značaj farmaceuta kao kvalifikovane osobe za rešavanje terapijskih problema na stručan način. Takođe, evidentiranje farmaceutskih usluga predstavlja težnju da se definiriše i standardizuje farmaceutska usluga i aktivnosti farmaceuta u apoteci, kako bi se postiglo povećanje kvaliteta usluge i minimalizacija grešaka u radu.

## **RECORDING OF PHARMACEUTICAL SERVICES IN PHARMACY SUBOTICA**

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All services provided by pharmacists in order to support the provision of pharmaceutical healthcare are pharmaceutical services. In addition to the basic role of supplying medicines, medical devices and products for health protection, pharmaceutical services include providing information on drugs, counseling, education and communication with patients/service users to improve their health and quality of life.

In Pharmacy Subotica, 32 classified pharmaceutical services are registered, which are implemented in existing software. This is one of the unique pharmaceutical activities started in 2016 as a pilot project, and at the end of 2017, recording was started in all branches of Pharmacy Subotica. The patient with a fiscal account receives a non-fiscal part on which the type of provided service is recorded.

In the period from December 2017 to February 2018, a total of 4387 pharmaceutical services was recorded. The services refers to giving advice to children, pregnant women and persons over 65 years of age (N = 1825), counseling on drug administration (N = 1645), counseling on new therapy (N = 229), prevention of drug interactions (N = 227), drug-food interactions (N = 219), advice on proper storage and disposal of medicines (N = 165), counseling about medical devices (N = 99), given advice on drug side effects (N = 73), prevention of therapy duplication (N = 70), counseling on adherence (N = 51). Pharmaceutical services related to healthy lifestyle counseling (N = 45), counseling for the prevention of chronic illness (N = 59) and the smoking cessation (N = 11) are services related to preventive activities of pharmacists.

The recording of pharmaceutical services emphasizes the importance of pharmacists as qualified persons for solving therapeutic problems in a professional manner and show tendency to define and standardize pharmaceutical services and activities in the pharmacy.

## **GREŠKE U IZDAVANJU LEKOVA U JAVNIM APOTEKAMA: PERSPEKTIVA SRBIJE**

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Izdavanje lekova predstavlja proces sklon nastanku grešaka, zbog čega može ugroziti bezbednost pacijenata. Ova studija je imala za cilj istraživanje broja grešaka koje nastaju u procesu izdavanja lekova u javnim apotekama u Srbiji, kao i njihovih zajedničkih uzročnih faktora.

Studija preseka sprovedena je u periodu januar-jun 2016. godine, distribuiranjem upitnika nacionalnom reprezentativnom uzorku farmaceuta u državnim i privatnim javnim apotekama u Srbiji. Upitnik je sadržao delove u vezi sa socio-demografskim karakteristikama ispitanika, nastankom propusta u izdavanju lekova na njihovom radnom mestu, brojem takvih incidenata, kao i njihovim uzročnim faktorima. Deskriptivna i inferencijalna statistička analiza izvršena je korišćenjem SPSS softvera ver. 21.0.

U studiji je učestvovalo 1004 ispitanika, pretežno ženskog pola (94.9%), prosečne starosti 41±10 godina i radnog iskustva 14±10 godina. Približno jedna polovina ispitanika (49%) potvrdno je odgovorila na pitanje da li je na njihovom radnom mestu načinjena greška u proteklih 6 meseci. Prosečan broj ovih incidentnih događaja bio je 2 (opseg 1-20), dok je ukupan broj prijavljenih propusta bio 941. Farmaceuti zaposleni u državnim apotekama su u statistički značajno većem udelu prijavili nastanak grešaka u izdavanju lekova u odnosu na učesnike iz privatnih apoteka ( $p < 0.001$ ), dok u vezi sa starošću i radnim iskustvom ispitanika nije uočena značajna razlika. Najznačajniji zajednički uzročni faktori prema stavu farmaceuta uključivali su preopterećenje radom i veliki broj recepata (42%), nečitak rukopis lekara (42%), kao i ometanje u radu (pacijenti, telefonski pozivi, buka) (21%).

Ova studija je identifikovala veliki broj grešaka koje nastaju u procesu izdavanja lekova u javnim apotekama u Srbiji, kao i najznačajnije zajedničke uzročne faktore ovih tipova incidenata. U skladu sa tim, potrebno je prospektivno definisati korektivne mere sa ciljem delovanja na uočene barijere i smanjenja broja incidenata, kao i sprovesti dalje istraživanje stope grešaka u izdavanju lekova.

## **DISPENSING ERRORS IN COMMUNITY PHARMACIES: A SERBIAN PERSPECTIVE**

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Medicines dispensing represents an error-prone activity, therefore potentially jeopardizing patient safety. This study aimed to explore the number of dispensing errors in Serbian community pharmacies as well as to assess the main joint root causes of such occurrences.

A cross-sectional survey was performed from January to June 2016 by distributing a self-administered questionnaire to a nationwide sample of community pharmacists in Serbia. The questionnaire included sections related to the participants' socio-demographic characteristics, as well as their awareness of dispensing errors being committed, number of such occurrences and their root causes. Descriptive and inferential statistical analyses were conducted using SPSS Statistics software ver. 21.0.

The study included 1,004 participants, mainly female (94.9%), with the mean age 41±10 years and mean registration length 14±10 years. Almost half the respondents (49%) demonstrated the awareness of dispensing errors being committed at their workplace during the past 6 months. The median number of such occurrences was 2 (range 1-20), while the total number of dispensing errors reported was 941. The practitioners working in state-owned community pharmacies were more likely to report the occurrence of dispensing incidents compared to those from privately-owned community pharmacies ( $p < 0.001$ ), while no statistically significant difference was found in terms of participants' age and work experience. The main joint root causes included work overload and high prescription volume (42%), illegible prescriber's handwriting (42%), as well as interruptions and distractions during dispensing (patients, telephone calls, noise) (21%).

This study revealed a substantial number of dispensing errors occurring in Serbian community pharmacies, as well as the main joint root causes of such incidents. Accordingly, it is necessary to define the corrective actions prospectively in order to tackle barriers identified and reduce the number of incidents, as well as to perform further research on dispensing error rates.

## **PROAKTIVAN PRISTUP UNAPREĐENJU BEZBEDNOSTI PACIJENATA U JAVNIM APOTEKAMA: PRIMENA ANALIZE NAČINA I EFEKATA OTKAZA**

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Izdavanje lekova predstavlja visoko rizičan proces, sklon nastanku propusta. Cilj ove studije je sprovođenje prospektivne analize rizika u procesu izdavanja lekova u javnim apotekama radi identifikacije, kvantifikacije i prioritizacije potencijalnih grešaka, kao i definisanja korektivnih mera za smanjenje rizika za bezbednost pacijenata.

Analiza načina (oblika) i efekata otkaza (FMEA) je sprovedena u periodu od januara do maja 2016. godine u Beogradu, Srbiji. Najpre je multidisciplinarni, desetočlani tim primenom tehnike „oluja ideja“ kreirao dijagram toka analiziranog procesa i identifikovao potencijalne greške, zajedno sa njihovim uzrocima i posledicama. Zatim su izračunati brojevi prioriteta rizika (RPN) za svaku potencijalnu grešku, na osnovu njene ozbiljnosti, učestalosti i detektabilnosti. Najzad, definisane su korektivne mere i procenjeni su njihovi potencijalni efekti za greške sa najvišim vrednostima RPN-ova.

FMEA analiza je identifikovala 30 potencijalnih grešaka, među kojima su najviše vrednosti RPN-ova bile pripisane neuspehu u identifikaciji ili rešavanju terapijskih problema za datog pacijenta (RPN 48), kao i izdavanju pogrešnog leka, ili leka pogrešne jačine, farmaceutskog oblika ili količine (RPN 40). Predloženo je jedanaest opštih i specifičnih korektivnih mera, među kojima su najefikasnije uključivale normiranje i strukturiranje usluge, uvođenje dodatne kontinuirane edukacije i obuke farmaceuta iz oblasti farmakoterapije, kao i implementaciju zdravstvenih tehnologija za elektronsko propisivanje i prenos recepata u apoteke. Suma vrednosti RPN-ova je smanjena sa 583 na 293 nakon hipotetičke implementacije predloženih intervencija, ukazujući na potencijalno smanjenje rizika od 50.3%.

Sprovođenjem FMEA analize je identifikovan veliki broj grešaka i korektivnih mera u vezi sa procesom izdavanja lekova na primarnom nivou zdravstvene zaštite. Dodatno, uočen je značajan potencijal za smanjenje rizika od nastanka grešaka u izdavanju lekova u slučaju implementacije kombinacije predloženih intervencija, čime je dobijena potvrda koncepta da je FMEA koristan alat za unapređenje bezbednosti pacijenata i kvaliteta farmaceutske usluge izdavanja lekova u javnim apotekama.

# PROACTIVE APPROACH TO ENHANCING PATIENT SAFETY IN COMMUNITY PHARMACIES: APPLICATION OF FAILURE MODE AND EFFECTS ANALYSIS

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Medicines dispensing is considered to be a high-risk and failure-prone pharmaceutical activity. This study aimed to perform a prospective risk analysis of this process in the community pharmacy setting to identify, quantify and prioritize potential failure modes, as well as to define adequate measures for patient safety risk reduction.

Failure Mode and Effects Analysis (FMEA) was conducted from January to May 2016 in Belgrade, Serbia. First, a multidisciplinary ten-member team used brainstorming to diagram the dispensing process and identify failure modes, along with their causes and effects. Then, the Risk Priority Numbers (RPNs) were calculated for each failure mode, based on its severity, occurrence and detectability. Finally, corrective actions were developed and their potential effects assessed for failure modes with high RPNs.

The analysis yielded 30 failure modes, of which the highest RPNs were assigned to the failure in identifying and resolving drug-related problems (RPN 48) and to dispensing of the wrong medicine, or its strength, form, or quantity (RPN 40). Eleven corrective actions, both general and stage-specific, were suggested. The most significant ones included service re-structuring, pharmacists' education and training in the field of pharmacotherapy, as well as introduction of healthcare technologies for computerized prescribing and transmission of prescriptions to the pharmacies. The sum of RPNs was reduced from 583 to 293 after the hypothetical implementation of corrective actions, which equals a risk reduction of 50.3%.

Various failure modes and corrective actions related to the medicines dispensing at the primary care level have been revealed. Additionally, the combination of measures proposed has been estimated as highly effective in reducing the risk of dispensing errors, indicating that FMEA approach is capable of providing useful solutions that could markedly improve patient safety and pharmaceutical service quality of the medicines dispensing in community pharmacies.

## UPRAVLJANJE RIZIKOM U PRUŽANJU ZDRAVSTVENE ZAŠTITE KORIŠĆENJEM CIT METODE

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*Critical incident tehniqe* (CIT) sadrži set procedura za sakupljanje direktnih opservacija ljudskog ponašanja u pravcu da olakša njihovu sposobnost u rešavanju praktičnih problema. CIT je dobro ustanovljeno kvalitativno sredstvo za istraživanje koje se koristi u mnogim oblastima zdravstvenih nauka, uključujući negu, medicinu, stomatologiju, farmaciju i njihove sisteme edukacije (korisnika i davaoca usluga). To je fleksibilan set principa koji mogu da se modifikuju u zavisnosti od potreba situacije. Cilj ovog rada je analiza upotrebe metode CIT (*Critical Incident Tehniqe*) u oblasti zdravstvene zaštite kao i kritički osvrt na mogućnost korišćenja u istraživanju farmaceutske prakse.

Izvršen je pregled literature u dve elektronske naučne baze (PubMed i SciDirect) po ključnim rečima: *Critical incident tehniqe, health care, risk management, pharmacy practice*, (2007-2017), a nakon toga su odabrani radovi po kriterijumima za uključivanje/isključivanje, a koji su poslužili za analizu. Od evidentiranih 1047 publikacija, 15 radova je zadovoljilo kriterijume uključivanja/isključivanja u našoj analizi. Publikacije koje su pokazale upotrebnu vrednost CIP tehnike su najzastupljenije u oblasti zdravstvene nege gde se ova metoda koristila kao tehnika ispitivanja socijalnih aspekata od značaja za rad medicinskih sestara, kao i na zadovoljstvo pacijenata uslugom. Metoda CIT se pokazala kao efikasna u pronalaženju uzroka ključnih problema u svakodnevnom radu zdravstvenih radnika. U oblasti farmaceutske prakse je evidentirano svega četiri publikacije gde je korišćena CIT za razumevanje određenih problema, a samim tim za definisanje korektivnih i preventivnih mera koje mogu poslužiti u smanjenima rizika aktivnosti aktera zdravstvenih usluga.

CIT metoda u oblasti zdravstvenih nauka se pokazala kao efikasna u pronalaženju odgovora u analizi koraka procesa rada zdravstvenih radnika gde postoji mogućnost rizika i grešaka, a koje mogu da se preveniraju i te poboljša kvalitet rada. S obzirom da su radne aktivnosti u oblasti farmaceutske prakse najčešće visokog rizika po bezbednost pacijenata, prvi primeri korišćenja CIT metode pokazuju da se značajno može unaprediti sistem upravljanja rizikom i kontinuirano poboljšati farmaceutske zdravstvene usluge i ishodi.

# **RISK MANAGEMENT IN PROVIDING HEALTH CARE USING CIT METHOD**

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Critical incident technique (CIT) contains a set of procedures for collecting direct observations of human behavior in order to facilitate their ability to solve practical problems. CIT is a well-established qualitative research tool used in many areas of health care, including care, medicine, dentistry, pharmacy and their education systems. It is a flexible set of principles that can be modified depending on the needs of the situation. The aim of this paper is to analyze the use of the Critical Incident Technique (CIT) method in the field of health care as well as a critical overview of the possibility of using in the research of pharmaceutical practice.

A review of the literature in two electronic scientific bases (PubMed and SciDirect) was performed in the following key words: Critical incident technique, health care, risk management, pharmacy practice, (2007-2017), after which works were selected according to the criteria for inclusion/which were used for analysis.

Out of 1047 publications, 15 works met the criteria of inclusion/exclusion in our analysis. It was noted that in the field of nursing, the CIT method was the most used as a technique for examining social aspects that affect the work of nurses and the patient's satisfaction with the service. The CIT method proved to be effective in finding the cause of the key problems in the daily work of health workers. In the field of pharmacy, only four papers were used that used the CIT to understand certain problems, and therefore for adequate corrective and preventive measures.

The CIT method is represented in various fields of science and in the field of health has proved to be effective in finding answers in which steps the work of health workers has the possibility of risks and mistakes that can be prevented and improve the quality of work. Considering that in the field of pharmacy a high risk area for patient safety, the use of the CIT method can significantly improve the risk management system and the continuous improvement of pharmaceutical health care.

## DA LI RODITELJI U SRBIJI RAZUMEJU UOBIČAJENE NAVODE UPOZORENJA U UPUTSTVIMA ZA LEKOVE ZA PEDIJATRIJSKU PRIMENU?

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Prethodne studije farmaceutske prakse su pokazale da roditelji ograničeno razumeju informacije navedene na pakovanjima i uputstvima za lek, i da ne mogu uvek identifikovati navode upozorenja. Pacijenti niže zdravstvene pismenosti imaju manju sposobnost da tačno objasne značenje upozorenja o bezbednosti i efikasnosti u Uputstvu za lek. Rečenice upozorenja uključuju informaciju da neki lekovi izazivaju „osetljivost na Sunce“, i da mleko ishrane može smanjiti apsorpciju nekih lekova uključujući antibiotike. Naš cilj je da se ispita koliko roditelji razumeju upozorenja o izlaganju suncu i upotrebi hrane koja sadrži mleko u toku primene terapije kod dece i povezanost farmakoterapijske pismenosti.

Ispitivanje je sprovedeno među roditeljima u vrtićima iz nekoliko opština u Beogradu, od septembra do oktobra 2016. Za ispitivanje funkcionalne zdravstvene pismenosti korišćen je S-TOFHLA instrument na srpskom, uz sociodemografski upitnik. Razumevanje navoda upozorenja je ispitano pomoću prethodno testiranog upitnika za ispitivanje farmakoterapijske pismenosti roditelja (PTHL-SR).

Ukupno, 300 roditelja je učestvovalo u ispitivanju. Većina roditelja su bile žene (80,7%), starosti 30-40 godina (75,3%), sa dvoje dece (66%). Skoro svi ispitanici su imali adekvatnu funkcionalnu zdravstvenu pismenost i znali su pouzdane izvore informacija o lekovima (80%). Prosečni procenat tačnih odgovora u PTHL-SR upitniku bio je 78% (SD=13,37). Ipak, svaki treći roditelj (36%) nije mogao tačno da objasni navod upozorenja o izlaganju suncu prilikom terapije uz tumačenje da dete ne treba izvoditi napolje dok koristi lek. Svaki peti roditelj (20%) nije u potpunosti znao da protumači značenje upozorenja o upotrebi mleka.

Roditelji predškolske dece u Srbiji su upoznati o pouzdanim izvorima informacija o lekovima, ali često ne umeju da potpuno protumače označena upozorenja o interakcijama lekova tokom izlaganja suncu i interakcijama sa hranom. Farmaceuti u apotekama imaju značajnu ulogu, jer bi trebalo da upozorenja objasne jasnijim rečima i tako utiču na poboljšanje efikasnosti i bezbednosti terapije.

## **DO PARENTS IN SERBIA UNDERSTAND COMMON WARNING STATEMENTS IN PEDIATRIC MEDICINES INFORMATION?**

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Previous studies from pharmacy practice showed that parents have limited understanding of statements written on package and leaflets of medicines and could not always identify warning statements. Patients with lower health literacy were less able to correctly explain the meaning of warnings in patient information leaflets for safety and efficacy reasons. These warning statements include info that some medicines are „sun-sensitizing”, and milk from food can reduce the absorption of many drugs including antibiotics. We aimed to investigate parental understanding of warning statements about sun exposure and milk consumption during children's therapy and association of pharmacotherapy literacy.

The survey was carried out among parents in kindergartens from few municipalities of Belgrade, from September to October, 2016. As a measure of functional health literacy, S-TOFHLA instrument in Serbian was administered with socio-demographic questionnaire. Parental understanding of warning statements was assessed with a pre-tested self-administered questionnaire (Parental pharmacotherapy literacy questionnaire –Serbian, PTHL-SR).

Altogether, 300 parents participated in the study. Most of parents who participated in the study were women (80.7%), aged 30-40 years (75.3%), with 2 children (66%). Almost all had adequate health literacy, and knew the reliable source of information about medicines (80%). The mean percent of correctly answered questions in PTHL-SR questionnaire was 78% (SD=13.37). However, every third parent (36%) could not properly interpret warning statement about sun exposure during therapy and interpreted that child should not go outside during medicine use. Every fifth parent (20%) couldn't fully explain the meaning of warning statement about milk.

Parents in Serbia are aware of reliable source of information about medicines, but they often don't know to fully interpret warning labels about sun exposure and food interactions with medicines. Pharmacists form community pharmacies play an important role, as they should explain these warnings in simpler words, thus improving safety and efficacy of therapy.

## **INTERAKCIJE HRANE I ANTIMIKROBNIH AGENASA: KONZISTENTNOST INFORMACIJA ZA GENERIČKE LEKOVE**

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Interakcije hrane i antimikrobnih agenasa mogu kompromitovati efikasnost i bezbednost terapijskog režima, kao i nutritivni status pacijenta. Kako bi prevenirali iste, zdravstveni profesionalci konsultuju referentne izvore informacija. Sažetak karakteristika leka (*eng. Summary of Product Characteristics, SPC*) je osnov pouzdanog i objektivnog informisanja, i u slučaju generičkih lekova sadržaj dokumenata bi trebalo da je konzistentan.

Cilj istraživanja je bio za generičke antimikrobne lekove komparirati informacije o interakcijama sa hranom, i razmotriti uticaj relevantnih faktora (datum prve autorizacije i broj generičkih lekova) na ishod analize.

SPC za sve generičke antimikrobne lekove za sistemsku upotrebu su preuzeti sa veb-sajta Agencije za lekove i medicinska sredstva Srbije; i iskazi od značaja su ekstrahovani iz različitih sekcija dokumenta i komparirani. Komparacija je bila bazirana na kategorizaciji iskaza o interakcijama u jednu od pet kategorija: „*efekti nutritivnog statusa na dejstvo leka*“, „*efekti hrane kao obroka na dejstvo leka*“, „*efekti specifičnog nutrijenta na dejstvo leka*“, „*efekti leka na status nutrijenta*“ i „*efekti leka na nutritivni status*“.

Ukupno 160 SPC je preuzeto za 30 generičkih lekova (prosečan broj 5,33 (SD=4,14); mediana 4,00 (IKR=5); opseg: 2-18). Devet (30%) antimikrobnih lekova (azitromicin, klaritromicin, cefazolin, cefepim, pipemidinska kiselina, ciprofloksacin, levofloksacin, moksifloksacin i gentamicin) je imalo nekonzistentne informacije. Nekonzistentnost je bila u vezi sa različitim kategorijama interakcija, i u izvesnim slučajevima mogla je imati klinički važne implikacije (gentamicin, fluorohinoloni). Postojanje većeg broja generičkih lekova je bilo u vezi sa identifikovanim razlikama ( $p=0,021$ ).

Jedna trećina generičkih antimikrobnih lekova je imala nekonzistentne iskaze o interakcijama hrana-lek. S obzirom na potencijalne kliničke implikacije, trebalo bi razmotriti strategije za harmonizaciju informacija.

# FOOD-ANTIMICROBIAL AGENT INTERACTIONS: CONSISTENCY OF INFORMATION FOR GENERIC DRUGS

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Food-antimicrobial agent interactions can compromise the efficacy and safety of therapeutic regimen, as well as the nutritional status of the patient. In order to prevent them, health professionals consult the reference sources of information. Summary of Product Characteristics (SPC) is the basis for reliable and objective informing, and in the case of generic medicines the content of documents should be consistent.

The aim study was to compare information on food-antimicrobial drug interactions for generic drugs, and to consider the influence of relevant factors (date of first authorisation and number of generic drugs) on the outcome of evaluation.

SPCs for all generic antimicrobials for systemic use were retrieved from the Medicines and Medical Devices Agency of Serbia website, and statements of interest were extracted from different sections and were compared. The comparison was based on categorization of statements on interaction into one of five categories: „*effect of nutrition status on drug action*”, „*effect of food in general on drug action*”, „*effect of specific nutrients or food components on drug action*”, „*effects of drugs on nutrient and metabolic status*”, or „*effects of drugs on nutrition status*”.

A total of 160 SPCs were retrieved for 30 generic drugs (mean number 5.33 (SD=4.14); median 4.00 (IQR=5); range: 2-18). Nine (30%) antimicrobials (azithromycin, clarithromycin, cefazolin, cefepime, pipemidic acid, ciprofloxacin, levofloxacin, moxifloxacin and gentamicin) had inconsistent information. The inconsistency was related to different categories of interactions, and in some cases it could have clinically important implications (gentamicin, fluoroquinolones). The existence of a larger number of generic medications was related to identified differences (p=0.021).

One third of generic antimicrobials had inconsistent food-drug interaction statements. Given the potential clinical implications, strategies for harmonization of information should be considered.

## **LANA TAFI – BORAC PROTIV FALSIFIKATORA: PODIZANJE I IZMENA SVESTI MLADIH O LAŽNIM LEKOVIMA KROZ INTERAKTIVNU STRIP IGRU**

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Lažni lekovi i medicinski proizvodi predstavljaju ogromnu opasnost po javno zdravlje na globalnom nivou. Ilegalna industrija i međunarodne kriminalne mreže zarađuju stotine milijardi evra godišnje na proizvodnji i distribuciji ovih proizvoda koji se uglavnom nude preko Interneta, i direktno su odgovorni za smrt i teške zdravstvene posledice kod stotina hiljada ljudi, a naročito dece. Međunarodne organizacije i nacionalna regulatorna tela se aktivno bore protiv ove pošasti kako kroz operativne akcije, ali i podizanje svesti o rizicima koje pacijenti preuzimaju kada se odluče da nabave lek mimo legalnog lanca snabdevanja - apoteka. Rad ima za cilj da pokaže jednu naučno utemeljenu edukativnu kampanju širokog obuhvata na temu podizanje svesti o falsifikovanih lekovima, nastale u saradnji Agencija za lekove Italije i Srbije i Saveta Evrope.

Multidisciplinarni tim iz Italije i Srbije je razvio materijal - interaktivno pripovedačko oruđe, koje kombinuje farmaceutske činjenice i istražne podatke sa psihološkom metodologijom. Ono je korišćeno udirektnim kontaktima sa mladima u vidu predavanja i radionica i imalo konkretne psiho-pedagoške rezultate u pogledu usvajanja ključnih poruka i modela ponašanja izbegavanja rizika.

Trogodišnje aktivnosti u promociji projekta „Lana Tafi - Otvoreni umovi, slobodni umovi” pokazuju da se kroz kontinuirani uticaj i prisustvo u javnosti, kako u medijima, ali pre svega u školama, fakultetima, i stručnim skupovima može obezbediti trajna i temeljna edukovanost ciljnih javnosti o pretnji koju predstavljaju lažni lekovi. Time se ostvaruju uspesi u pogledu suštinskog razumevanja problematike, daljeg širenja informacija iz „Lana Tafi” izdanja, pa čak dovodi do smanjenja potražnje za ovim proizvodima.

Neophodno je upotrebiti dalje resurse kako bi se uz internacionalnu podršku i koordinaciju nastavila ova i slične inicijative koje ostvaruju konkretne, merljive rezultate, ali takođe zahtevaju konstantnu prisutnost i strpljiv rad sa mladima.

## **LANA TAFI - FIGHTER AGAINST FALSIFICATION: RAISING AND CHANGING YOUNG PEOPLE'S AWARENESS OF FAKE MEDICINES THROUGH AN INTERACTIVE COMIC BOOK GAME**

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False medicines and medical products pose a huge public health threat globally. The illegal industry and international criminal networks earn hundreds of billions of euros annually on production and distribution of these products, mainly offered over the Internet, and directly responsible for the death and severe health consequences of hundreds of thousands of people, especially children. International organizations and national regulatory bodies actively fight against this monstrosity both through operational actions and raising awareness on risks patients take when they purchase a medicine past the legal supply chain -pharmacy. Aim of the paper is to show the results of a scientifically crafted and effective educational campaign on a wide range of topics, developed in cooperation with the Medicines Agency of Italy and Serbia and the Council of Europe.

A multidisciplinary team from Italy and Serbia has developed material - an interactive narrative tool that combines pharmaceutical facts and research data with a psychological methodology. It was used in direct contact with young people in the form of lectures and workshops and had concrete psycho-pedagogical results with regard to the adoption of key messages and risk avoidance models.

Three-year activities in promoting the project „Lana Tafi - Open minds, free minds” show that through continuous influence and presence in the public, media, but above all in schools, faculties, and professional meetings, permanent and basic educating of the target public about the threat from falsified medicines can be ensured. This signifies achievements in terms of essential understanding of issues, further dissemination of information from the „Lana Tafi” edition, and even leads to a decrease in demand for these products.

It is necessary to use further resources to continue these and similar initiatives with international support and coordination that achieve concrete, measurable results, but also require constant presence and patient work with young people.

## **NEW EU MEDICAL DEVICES REGULATIONS - KEY CHALLENGES RELATED TO QUALITY AND SAFETY OF MEDICAL DEVICES**

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The medical devices (MD) sector, including products ranging from simple bandages to the most sophisticated medical equipment, plays a crucial role in the diagnosis, prevention, monitoring and treatment of diseases. It helps improve quality of life of disabled people and also people rely on these devices every day and expect them to be safe and incorporate the latest improvements in science and innovation. Documentary analysis of benefits from new EU rules in order to ensure quality and safety of MD was performed.

Healthcare professionals should be obliged to first improve the quality, safety and reliability of MD both already on the market and in the process of developing. It is of essence that not only high-risk devices be under very strict control, but also general products, such as colored contact lenses, should be subject to stricter control before placed on the market. Also, it is very important that the consumers have an easy access to information, most of which will be enabled by the EUDAMED where all the essential information for MDs can be found. For implanted devices, an „implant card” will give more information to patients. The problem of existence of substandard and falsified MD is an unacceptable risk to public health, so introduction of a new unique device identifier (UDI) will allow easier traceability of MD and also new rules will enhance vigilance and market surveillance. Hence, collecting data about the performance, quality and safety of MD at EU countries is a must.

Developing and placing a MD on the EU market requires consideration of regulatory requirements as well as intellectual property protection. New EU rules are made in order to ensure patient safety, strengthen the legal system, promote harmonization between EU countries and at the same time maintain the economic benefits of manufacturers.

## **NEW ROLE OF POST-MARKET SURVEILLANCE IN MEDICAL DEVICE INDUSTRY**

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Medical Device Regulation (MDR) re-defines the post-market surveillance (PMS) process and gives it a significant new role in the fundamentals for compliance with MDR requirements. Comparative analysis is used to extract and clarify the key steps to be taken by the manufacturers in order to modify their quality management system (QMS) for proactive collection and review of experience from the market for ensuring continuous maintenance of the quality, safety and efficacy of their products. Comparative analysis between PMS requirements in MDD93/42/EEC and MDR2017/745 has been performed.

Comparative analysis has shown that in the new MDR, PMS is not only defined (Article 2(60)), it is listed as one of the general obligations of all manufacturers (new Article 10), it is also one of the topics specifically called out for monitoring by the person responsible for regulatory compliance (new Article15). Precisely what is expected of the manufacturer's PMS system is set out in the new Article83. Among other things, PMS system is to be used to update the clinical evaluation, benefit-risk determination, instructions for use and labeling etc. As oppose to MDR, in MDD, PMS is mentioned and not clearly defined in Annex X (Clinical evaluation) and in conformity assessment procedures (Annexes II-VII). Here PMS is considered a tool for providing data for update of clinical evaluation with manufacturers' obligation to "institute and keep up to date a systematic procedure to review experience gained from devices in the post-production phase".

Compliance with new MDR requires manufacturers to create and continuously maintain effective PMS system. This can be achieved by playing „an active role during the post-market phase by systematically and actively gathering information from post-market experience with their devices in order to update their technical documentation and cooperate with the national competent authorities in charge of vigilance and market surveillance activities".

## UPRAVLJANJE KRITIČNIM INCIDENTIMA U FARMACEUTSKOM LANCU SNABDEVANJA

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Autsors ili outsorsing (eng. outsourcing) predstavlja proces isključivanja određenih aktivnosti i poslova iz organizacije koji nisu od strateškog značaja - poveravanje aktivnosti/procesa kvalifikovanim ugovornim partnerima koji će ih obaviti brže, bolje, jeftinije, kojima je dati proces osnovno poslovanje. Outsorsing u lancu snabdevanja lekovima je veoma kompleksan zbog strogih regulativnih odredbi koje se odnose na kvalitet i bezbednost lekova. Kreiranje liste incidenata i vodiča za identifikaciju rizika, kao i prevenciju mogućeg stanja neuspeha prilikom poveravanja aktivnosti ugovornom partneru ključnih procesa u farmaceutskom lancu snabdevanja industriji.

Na osnovu podataka iz literature i intervju sa ekspertima iz oformljenog multidisciplinarnog tima, generisana je lista i pregled incidenata koji su zapaženi prilikom poveravanja aktivnosti (eng. outsource) u farmaceutskoj industriji.

Na osnovu generisane liste incidenata, napravljena je baza i kategorizacija rizika primenom FMEA metode određivanjem broja prioriteta rizika (RPN), pre i nakon implementacije korektivnih/preventivnih mera (CAPA). RPN broj upućuje na rizičnost performanse ili koraka, gde se kritičnima smatraju sve one čiji je RPN veći od 80 i za koje su implementirane CAPA.

Zapaženo je da je najveći broj kritičnih rizika koji imaju  $RPN \geq 80$  u procesu proizvodnje, distribucije lekova i u kliničkim ispitivanjima, alii ostali navedeni rizici, u zavisnosti od specifične situacije mogu u velikoj meri da ugroze bezbednost pacijenata, da dovedu do velikih finansijskih gubitaka i ugrožavanja reputacije, pa je neophodno pre poveravanja aktivnosti davaocu usluge/ugovornom partneru uzeti u obzir sve navedene rizike. Ukoliko se CAPA implementiraju pre početka sprovođenja aktivnosti, u velikoj meri se smanjuje rizik.

Korisnik usluge mora da dobro poznaje proces i aktivnosti koji se poveravaju davaocu usluge, kako bi se minimizirali potencijalni rizici i neadekvatno obavljanje aktivnosti, s obzirom da je konačna odgovornost na organizaciji koja je nosilac procesa (korisnik usluge). Od ideje do realizacije outsorsinga treba koristiti procesni pristup koji kombinuje principe: odlučivanja, procene rizika, pregovaranja i ugovaranja.

# MANAGEMENT OF CRITICAL INCIDENTS IN THE PHARMACEUTICAL SUPPLY CHAIN

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Outsourcing is the process of transferring certain activities/processes from an organization that are not of strategic importance- activities are entrusted to qualified contract partners who will perform them faster, better, cheaper because outsourced activities are their core business. Outsourcing in the drug supply chain is very complex due to strict regulations related to the safety and quality of medicines. The aim of this research is to create a list of incidents and guidelines for identifying risks, as well as to prevent the possible outsourcing failure of a contractual partner for key processes in the pharmaceutical industry.

From literature data and on the basis of interviews with experts from the multidisciplinary team, a list of incidents was generated, according to the incidents that were noticed during the outsourcing of the key processes in the pharmaceutical industry.

Based on the generated list of incidents, a risk database was made, as well as risk categorization before and after the implementation of corrective / preventive measures (CAPA) using the FMEA method by determining the Risk Priority Number (RPN). RPN indicates risk, so if RPN is greater than 80, then the risk is considered as critical and CAPAs were implemented.

The majority of critical risks ( $RPN \geq 80$ ) have been observed in production, distribution and clinical trials. However, depending on the specific situation also the other risks can greatly endanger the safety of patients, lead to major financial losses and compromise company reputation, so it is necessary to take into account all the above risks before entrusting the activity. If the corrective and preventive measures (CAPA) are implemented before the start of the activity, the risk is greatly reduced.

Service user is well aware of the process and activities that are entrusted/delegated to the service provider in order to minimize potential risks and inadequate performance of the activity, since the ultimate responsibility relies on service. In this regard, when outsourcing, the process approach combining decision making, risk assessment, negotiation and contracting principles should be used from the idea to realization.

## **TRANSPORT LEKOVA I MEDICINSKIH SREDSTAVA BESPILOTNOM LETELICOM**

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Velike klimatske promene, potrošnja fosilnih goriva, globalno otopljanje, zagađenje vazduha i vode, primoravaju civilizaciju na pronalaženje alternativnih rešenja kako bi se umanjila potrošnja postojećih resursa. U veku velikih i brzih promena, tehnoloških inovacija, farmaceutska delatnost se takođe ubrzano prilagođava nametnutim trendovima. Inovativni biznis u farmaceutske delatnosti pruža već razvijenom farmaceutske „aparatu“ mogućnost upoznavanja ili razvijanja novih farmaceutske proizvoda ili usluga, uz pomoć novih tehnologija. Posebna pažnja u razvijanju farmaceutske usluga su usluge transporta lekova i medicinskih sredstava (L i MS).

Cilj istraživanja je pronalaženje alternativnih sistema za dostavu leka/medicinskih sredstava koji ispunjavaju ekološke standarde, principe Dobre distributivne prakse i pružanja pravovremene pomoći, odnosno, dostavljanje leka ili medicinskih sredstava bespilotnom letelicom. Istraživanje obuhvata dosadašnje projekte i saznanja, inovativne usluge transporta L i MS u lancu snabdevanja, u svetu i kod nas. Za potrebe rada izvršena je studija preseka pomoću namenski razvijenog upitnika. Uzorak je sačinjavao 92 ispitanika (zdravstveni profesionalci i nezdravstveni kadrovi zaposleni u zdravstvenim ustanovama). Ispitani su njihovi stavovi vezano za ovaj vid transporta leka/medicinskog sredstva. Rezultati do kojih smo došli su pokazali da postoji želja i potreba da se zdravstvena i nezdravstvena javnost upozna sa jednom od mogućih inovacija u farmaceutske biznisu, a koji bi uneo značajne promene u farmaceutske poslovanju i svakako unapredila pravovremenost i kvalitet farmaceutske usluge.

## **TRANSPORT OF MEDICINES AND MEDICAL DEVICES BY UNMANNED AIRCRAFT**

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Huge climate change, fossil fuel consumption, global warming, air and water pollution, force civilization to find alternative solutions to reduce the consumption of existing resources. In the century of big and fast changes, technological innovations, pharmaceutical activity is also rapidly adapting to imposed trends. Innovative business in the pharmaceutical industry, provides an already developed pharmaceutical „machinery,, the ability to learn or develop new pharmaceutical products or services, with the help of new technologies. Particular, when it comes to the development of pharmaceutical services, is the transportation of medicines and medical devices (M and MD).

The aim of the research is to find alternative ways of medicines/medical devices delivery that meet environmental standards, the principles of Good Distribution Practices and the provision of timely assistance, that is, the delivery of medicines or medical devices with unmanned aircraft. The research includes the projects and knowledge, the mentioned innovations, in the world and in our country.

For the purposes of the work, a cross section study was carried out, using a deliberately developed questionnaire. The sample was made up of 92 respondents (health professionals and, non-medical staff employed in health organizations). Their attitudes regarding this form of medicines/medical devices transport were examined.

The results we have obtained showed that there is a desire and need for the health professionals and non-health public staff to become familiar with one of the possible innovations in the pharmaceutical business, which would introduce significant changes in pharmaceutical business and certainly improve the timeliness and quality of pharmaceutical services.

## BUDUĆI TRENDOWI FARMACEUTSKOG TRŽIŠTA I KLJUČNI FAKTORI

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Farmaceutsko tržište se menja dramatično iz godine u godinu, pri čemu ima veliki uticaj na farmaceutsku industriju. Cilj ovog rada je da prikaže trendove na farmaceutskom tržištu i faktore od značaja, koji će uticati na strategiju prometa lekova u budućnosti. Sprovedeno je istraživanje pretraživanjem publikacija na Google Scholar-u korišćenjem ključnih reči: *pharmaceutical marketplace*, *pharmaceutical industry*, *pharma marketing*, *socio-economic trends*, itd.

Identifikovano je sedam glavnih socijalno-ekonomskih faktora, koji utiču na razvoj farmaceutskog tržišta. Jedan od faktora je porast prevalencije hroničnih bolesti, što će kao posledicu imati smanjenje cene lekova za lečenje hroničnih bolesti. Zatim, sve je veći uticaj kreatora politike zdravstvene zaštite i platioca zdravstvene usluge na propisivanje lekova. Stoga će industrija morati u cilju povećanja dobiti da sarađuje i sa platiocima i davaocima zdravstvene usluge. Bitan faktor je porast plaćanja-po-učinku, odnosno industrija će morati da dokaže efektivnost svojih lekova. Značajan faktor je nestajanje granice između različitih oblika pružanja zdravstvene usluge, usled ekspanzije primarnog sektora zdravstvene zaštite i samomedikacije. Zatim, tržišta su u zemljama razvoja raznovrsna, usled čega će industrija morati da se prilagodi njihovim individualnim potrebama. Fokus vlade u mnogim zemljama prelazi sa lečenja na prevenciju, zbog čega će industrija morati da izgradi nov imidž kako bi stekla poverenje pacijenata. Regulatorni organi postaju sve svesniji rizika, te su nacionalne agencije sve obazrivije prilikom izdavanja dozvole za lek. Takođe, tržište je zasićeno saradnicima prodaje. Velike internacionalne kompanije najavljuju značajna smanjenja broja saradnika, većinom u oblasti marketinga i prodaje. Ukoliko farmaceutska industrija želi nov, efektivan model marketinga i prodaje, moraće da sarađuje i sa platiocima i davaocima zdravstvene usluge.

## **FUTURE TRENDS OF THE PHARMACEUTICAL MARKETPLACE AND KEY FACTORS**

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The pharmaceutical marketplace is changing dramatically from year to year, with great impact on the pharmaceutical industry. The aim of this study is to present trends in the pharmaceutical marketplace and important factors, which is expected to influence the strategy of medicines marketing and sales in the future. The research was conducted by searching publications on Google Scholar using key words: pharmaceutical marketplace, pharmaceutical industry, pharma marketing, socio-economic trends, etc.

Seven major socio-economic factors have been identified, which influence the development of the pharmaceutical marketplace. One of the factors is the increase in the prevalence of chronic diseases, which will result in a reduction of the price of medicines for the treatment of chronic diseases. Thereafter, healthcare policy-makers and payers are increasingly influencing drug prescribing. Therefore, in order to increase profit, the industry will have to cooperate with healthcare payers and providers. An important factor is the increase in pay-for-performance i.e. industry will have to prove the effectiveness of its medicines. A significant factor is the disappearance of the boundary between different forms of healthcare, due to expansion of the primary-care sector and self-medication. Then, markets of the developing countries are diverse, and industry will have to adapt to their individual needs. The focus of government in many countries is shifting from treatment to prevention, which will require the industry to build a new image in order to gain trust of patients. Regulatory authorities are becoming more risk-averse, and national agencies have become much more cautious about approving medicines. Also, the market is saturated with sales representatives. Large international companies announce significant reductions in the number of representatives, many of them in marketing and sales.

If pharmaceutical industry wants a new, effective model of marketing and sales, it will have to collaborate with healthcare payers and providers.

## **MARKET ACCESS OF ANTIPSYCHOTIC DRUGS IN REPUBLIC MACEDONIA**

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Antipsychotics are drugs mainly used in therapy of symptoms of psychosis such as schizophrenia, manic psychosis, depression etc. The treatment of the patients with psychotic conditions is directly connected with physical and financial availability of safe, effective and drugs with good quality. The market access of antipsychotics implies analysis of all antipsychotics registered in Republic of Macedonia, their status as regards the reimbursement, financial and physical availability, compared with the recommendations for the treatment of psychosis in evidence-based medicine and other therapeutic guides, as well as the analysis of the consumption of antipsychotic products dispensed and reimbursed by the Health Insurance Fund (HIF) in pharmacies in Macedonia. For this purpose, we used relevant data from primary, secondary and tertiary literature, recommendations from Evidence-based Medicine, official data from world and national drug registers and published reports from the HIF of Republic of Macedonia for consumption of antipsychotics from the Positive List for the period 2011-2015. For data processing we used the descriptive method and presented the obtained results in tabular form.

The market access of antipsychotics in Republic of Macedonia is characterized with high presence of generic drugs, high consumption determined by the number of issued prescriptions and also by the financial amount. Innovative drugs hardly enter the market and even more difficult on the Positive List, due to the financial constraint of the Health Insurance Fund and complicated procedures. These important factors significantly limit the possibility of doctors' choice to introduce new therapy in these patients, to monitor the effects of treatments and also to gain experience with innovative drugs and treatment. Obtained results clearly show that it is necessary to improve health and drug policies in order to improve the possibility of effective treatment of these patients in accordance with the recommendations and clinical guidelines.

## **ANALIZA POTROŠNJE LEKOVA ZA KARDIOVASKULARNI SISTEM U SRBIJI TOKOM PERIODA 2006-2015. GODINA**

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Stope smrtnosti od bolesti srca i krvnih sudova u Srbiji u periodu 2006-2015 beleže pad sa 795/100000 stanovnika na 766,3/100000 stanovnika. Analiza trenda upotrebe lekova za kardiovaskularne bolesti može pružiti uvid u racionanost farmakoterapijskih intervencija. Cilj istraživanja je procena potrošnje lekova za kardiovaskularni sistem (KVL) u Republici Srbiji tokom perioda 2006-2015.

Podaci o potrošnji KVL su preuzeti iz publikacija „Promet i potrošnja lekova za upotrebu u humanoj medicini” Agencije za lekove i medicinska sredstva Srbije, za period 2016-2015. godina. Potrošnja lekova je iskazana kao broj definisanih dnevnih doza/1000 stanovnika/dan (DDD/HSD).

Analizirajući potrošnju KVL od 2006. do 2015. godine, uočava se veoma veliki porast, 387,8 prema 701,41 DDD/HS; lekovi koji deluju na renin-angiotenzin sistem su najviše korišćeni uz trend stalnog porasta, 168,84 prema 351,15 DDD/HSD; zatim slede blokatori kalcijumskih kanala, 51,59 prema 125,35 DDD/HSD, beta blokatora, 48,76 prema 85,16 DDD/HSD. Od 2013. lekovi koji deluju na renin-angiotenzin sistem čine više od 50% potrošnje svih KVL. U 2011. su u okviru ove grupe uvedene kombinacije sa diureticima, koje prosečno čine oko 20% potrošnje navedene grupe lekova. Diuretici beleže blagi porast potrošnje, 24,26 prema 32,49 DDD/HSD. Lekovi u terapiji bolesti srca i antihipertenzivi nemaju značajnih promena u potrošnji. Hipolipemici pokazuju čak trostruki porast potrošnje, 12,75 prema 37,53 DDD/HSD. Potrošnja perifernih vazodilatatora beleži pad, 20,87 prema 8,01 DDD/HSD.

Ukupna potrošnja KVL u Srbiji je dvostruko porasla u periodu 2006-2015. Za sve podgrupe KVL zabeležen je porast potrošnje, izuzev perifernih vazodilatatora. Dominantna potrošnja lekova koji deluju na renin-angiotenzin sistem je u skladu sa nacionalnim preporukama gde se upravo ovi lekovi navode kao racionalan izbor u terapiji najvećeg broja kardiovaskularnih oboljenja, a kod pojedinih i kao lekovi prvog izbora. Međutim, uzroke veoma velikog porasta potrošnje KVL potrebno je istražiti u budućim istraživanjima.

# **ANALYSIS OF CARDIOVASCULAR DRUGS CONSUMPTION IN SERBIA DURING THE PERIOD 2006-2015**

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Mortality rate due to cardiovascular diseases in Serbia decreased from 795,0/100.000 to 766,3/100.000 individuals during the period 2006-2015. An analysis of utilization of cardiovascular drugs (CVD) can provide an insight into the rationality of pharmacotherapeutic interventions. The aim of the study was to evaluate the utilisation of CVD in the Republic of Serbia during the period 2006-2015. The source of data was the series of publications „Marketing and consumption of medicinal products for human use” of the Medicines and Medical Devices Agency of Serbia. The data are expressed as the number of defined daily dose/1000 inhabitants/day (DDD/TID).

Total consumption of CVD has increased in the period 2006-2015, 387.8 vs. 701.41 DDD/TID; drugs for renin-angiotensin system dominated, with continuous increased in consumption, 168.84 vs. 351.15 DDD/TID. Consumption of calcium channels blockers has also increased, 51.59 vs. 125.35 DDD/TID, similar as beta blockers, 48.76 vs. 85.16 DDD/TID. Medicines for renin-angiotensin system have shown more than 50% share in total CVD consumption from 2013 and later on. In 2011, combinations of renin-angiotensin system with diuretics has been introduced and made about 20% consumption of this group of drugs. Diuretics consumption has slightly increased, 24.26 vs. 32.49 DDD/TID. Cardiac therapy drugs and antihypertensives had no significant changes in consumption. Hypolipemics demonstrated three times growth, 12.75 vs. 37.53 DDD/TID. Consumption of peripheral vasodilators has decreased, 20.87 vs. 8.01DDD/TID.

Consumption of CVD has doubled from 2006 to 2015 in Serbia. All CVD groups of drugs have shown growth in consumption, excepted peripheral vasodilators. The dominant consumption of drugs for renin-angiotensin system is in line with national recommendations where these drugs are recommended as a rational choice in treatment of the majority of cardiovascular diseases, and in some as first-line therapy. However, the causes of observed high increase in total CVD consumption should be investigated in future research.

## **ANALIZA POTROŠNJE LEKOVA U TERAPIJI DEPRESIJE NA TERITORIJI GRADA BEOGRADA**

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Depresija se definiše kao poremećaj raspoloženja. Manifestuje se usporenom motorikom i mentalnom dinamikom, gubitkom motivacije, interesovanja i energije, osećaj tuge i predstavlja vodeći uzrok nesanicе. Lekovi za otpočinjanje terapije i hroničnu terapiju su antidepresivi podeljeni u četiri osnovne vrste: selektivni inhibitori preuzimanja serotonina, inhibitori preuzimanja serotonina i noradrenalina, inhibitori mono-amino-oksidadze i triciklični andidepresivi. Cilj ove studije je da se izvrši analiza potrošnje lekova izgrupe antidepresiva na osnovu baze podataka Apoteke „Beograd”. Analizirana je godišnja potrošnja, na mesečnom nivou.

Koristili smo bazu podataka za period 01.01.2017-31.12.2017.godine za apoteke u sastavu Apoteke „Beograd”. Analizirana je ciljna populacija, pol, indikacija, lekovi koji se upotrebljavaju, vrsta farmakološkog oblika, veličina pakovanja, broj izdatih pakovanja. Rezultati su prikazani udelom selektovanih recepata za tražene dijagnoze u ukupnom broju propisanih recepata. Prilikom selektovanja baze podataka koristili smo standardne statističke metode.

Svega 3% pacijenta uzrasta od 15 do 30 godina koriste terapiju antidepresiva, a čak 56% čini populacija starija od 60 godina, što je ujedno i najveći procenat. Žene su znatno izloženiје depresiji, čak 68%, dok svega 32% muškaraca boluje od iste. Kada je reč o dijagnozi, blagu depresiju ima 85% korisnika, dok povratni depresijski poremećaj ima svega 15%. Međunarodni nezaštićen naziv leka (INN) koji se najviše upotrebljavaju su sertalin (31%), escitalopram (15%), fluoksetin (12%), a najmanje moklobemid, tianeptin natrijum, bupropion hlorid (ispod 1%). Najzastupljenija su pakovanja od 28 tableta (48%), 30 tableta (41%), a najmanje se izdaju lekovi pakovani od po 100 i 50 tableta (svega 1%). Najveću prednost imaju film tablete (76%), a najmanju dražeje (1%).

Rezultati analize potrošnje lekova iz grupe antidepresiva pokazuju da se mesečno izda čak 8750 kutija. Najveći procenat obolelih su žene, populacija starija od 60 godina, većina pacijenata ima dijagnozu blage depresije. Lekovi koji su najviše u upotrebi su sertalin i fluoksetin.

# **ANALYSIS OF DRUG CONSUMPTION IN THE DEPRESSION THERAPY IN BELGRADE**

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Depression is defined as a mood disorder, manifested by slow motor skills and mental dynamics, loss of motivation, interest and energy, a sense of sadness and is the leading cause of insomnia. First-line drugs suitable for the initiation of therapy and chronic therapy as antidepressants are divided into four basic types: selective serotonin reuptake inhibitors, serotonin and noradrenaline reuptake inhibitors, inhibitors of mono-amino oxidase inhibitors and tricyclic antidepressants. The aim of this study was to analyze the usage of antidepressants drugs based on the Pharmacy “Beograd” database. We analyzed the annual consumption on a monthly basis.

Pharmacy „Beograd” database information for the period 01.01.2017-31.12.2017. We analyzed the target population, gender, indication, drugs used, pharmacological form, size, packaging and the number of packages issued. The results are shown by the proportion of selected prescriptions for the required diagnoses in the total number of prescribed prescriptions. We used standard statistical methods when selecting a database.

Only 3% of patients aged 15 to 30 used antidepressant therapy, while 56% of the population older than 60 had used antidepressant therapy, which is the highest percentage. Women are more prone to depression, as much as 68%, while only 32% of men suffer from it. When it comes to diagnosis, mild depression affects 85% of users, while reverse depressive disorder affects only 15%. The International non-proprietary names that are commonly used are sertraline (31%), escitalopram (15%), fluoxetine (12%), and moclobemide, tianeptine sodium, chloride bupropion each less than 1%. The most common packaging of tablet is 28 (48%), 30 tablets (41%), and the least issued medicines were packed by 100 and 50 tablets (only 1%). The most used drugs are film-coated tablets (76%), and the lowest are dragées (1%).

The results of the analysis of consumption of medicines from this group of antidepressants shows that monthly as many as 8750 boxes of drugs are issued, that the largest percentage of people affected are women, and people over 60, with most patients diagnosed with mild depression. Drugs that are most in use are sertraline and fluoxetine.

## **ANALIZA POTROŠNJE ANTIMIKROBNIH LEKOVA U TERAPIJI INFEKCIJA UROTRAKTA**

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Akutni nekomplikovani cistitis predstavlja jednu od najčešćih indikacija za propisivanje antimikrobnih lekova kod zdravih žena sa normalnim urogenitalnim traktom. Cilj ovog rada je analiza potrošnje antimikrobnih lekova u lečenju nekomplikovanog cistitisa u primarnoj zdravstvenoj zaštiti i stepen usklađenosti sa važećim preporukama.

Kao izvor podataka korišćenja je baza podataka Apoteke „Beograd” za period januar - decembar 2017. godine. Odabrani su svi izdati recepti lekova iz grupe J01 propisani ženama starosti 15-49 godina za indikaciju cistitis (MKB-N30). Podaci su obrađeni standardnim statističkim metodama i koristeći DDD/ATC metodologiju, potom sistematizovani i prikazani grafički i tabelarno. Potrošnja antibiotika prikazana je brojem definisanih dnevnih doza (DDD)/1000 stanovnika/dan. Analiziran je i udeo izdatih receptata prema internacionalnom nezaštićenom nazivu (INN) u ukupnom broju izdatih receptata za navedenu dijagnozu.

Najpropisivaniji antibiotik za terapiju cistitisa kod žena u posmatranom periodu bio je ciprofloksacin (35% od ukupno potrošenih DDD). Drugo mesto zauzima cefaleksin (25,63% od ukupno potrošenih DDD). Potrošnja fluorohinolona i cefalosporina zajedno čini 79% ukupne potrošnje antibiotika. U ukupnom broju receptata udeo fluorohinolona raste sa godinama (7,1% receptata u grupi 15-19 godina, 53,3% u grupi 40-49 godina), a cefalosporina opada (82,9% u grupi 15-19 godina, 28,6% u grupi 40-49 godina). Prema preporukama Internacionalnog vodiča kliničke prakse (IDSA, 2010. god) lekovi prvog izbora za tretman nekomplikovanog cistitisa su nitrofurantoin, trimetoprim-sulfametoksazol (za lokalnu rezistenciju <20%) i fosfomicin. Drugu liniju čine fluorohinoloni i alternativno beta laktami. Lek prvog izbora prema preporukama Nacionalnog vodiča je trimetoprim-sulfametoksazol (za lokalnu rezistenciju <20%), dok su fluorohinoloni lekovi drugog izbora.

Preporuke aktuelnih vodiča nisu poštovane. Kao potencijalni uzroci mogu se navesti: trenutna snabdevenost tržišta lekovima, kao i pokrivenost troškova samo određene terapije od strane Republičkog fonda za zdravstveno osiguranje, rezistencija na antimikrobne lekove. Uočeno nepoštovanje preporuka treba istražiti detaljnije u narednim studijama.

# ANALYSIS OF CONSUMPTION OF ANTIMICROBIAL DRUGS IN THE URINARY TRACT INFECTION

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Acute uncomplicated cystitis represents one of the most common indications for antimicrobial prescribing to otherwise healthy women without genitourinary abnormalities. The aim of this study was to analyze antibiotic consumption for uncomplicated cystitis in primary care and the level of compatibility with applicable recommendations.

Data source was a Pharmacy „Belgrade” database for the period January - December 2017. Antibiotic prescriptions issued to women 15-49 years old for diagnose cystitis (MKB-N30) were selected. Data was analyzed with standard statistical method and using DDD/ATC index, then summarized graphically and tabularly. Antibiotic consumption was expressed in defined daily dose (DDD)/1000 inhabitants/day. The share of antibiotic prescriptions by INN in the total number of issued prescriptions for cystitis were also analyzed.

The most common prescribed antibiotic for the treatment of uncomplicated cystitis in women was ciprofloxacin, followed by cephalexin (35% and 25.63% of total consumed DDD, respectively). Consumption of cephalosporin and fluoroquinolones makes 79% of total antibiotic consumption. In the total number of prescriptions the share of prescriptions for fluoroquinolones increases (7.8% in the group 15-19 years old, 53.3% in the group 40-49 years old) and for cephalosporin decreases (82.9% in the group 15-19 years old, 28.6% in the group 40-49 years old) with age. The International Clinical Practice Guideline (IDSA, 2010) recommends nitrofurantoin, sulfamethoxazole-trimethoprim (for local resistance rates <20%) and fosfomycin as the first choice in therapy. The second line therapy is fluoroquinolones, alternatively beta-lactams. The National Guidelines recommend sulfamethoxazole-trimethoprim (for local resistance rates <20%) and fluoroquinolones as the first and second line therapy, respectively.

Recommendations of applicable guidelines are not followed. The potential causes of noncompliance are: the current market supply, only partial coverage of the therapy costs by the National Health Insurance Fund and antibiotics resistance. The noted noncompliance should be further analyzed.

## ANALIZA POTROŠNJE ANTIMIKROBNIH LEKOVA U TERAPIJI UPALE SREDNJEG UHA KOD DECE

Marija Pavlović

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*Otitis media* je zajednički termin za zapaljenski proces sluznice srednjeg uhai jedno je od najčešćih oboljenja kod dece starosti do 10 godina. Cilj ove studije bio je da se analizira propisivanje i evaluira racionalna upotreba antimikrobnih lekova u terapiji *Otitis media* kod dece starosti do 10 godina.

Kao izvor podataka korišćena je baza o prometu lekova izdatih u Apoteci „Beograd” tokom 2017. godine. Za lekove izdate za dijagnoze H65-H69 (MKB-10), ekstrahovani su sledeći podaci: ATC šifra, internacionalni nezaštićeni i komercijalni naziv leka, farmaceutski oblik, veličina pakovanja, količina izdatih pakovanja, mesec izdavanja, kao i uzrast i pol deteta kome je lek izdat.

Ukupan broj izdatih pakovanja antimikrobnih lekova posmatranoj populaciji bio je 9.487, što je 30,61% od ukupno izdatih za populaciju svih starosnih doba. Najveći broj pakovanja izdat je za indikaciju H65, 8.447 (88%), a dosta manje za H66, 965 (10,2%) i H68, 75 (2%). Devojčicama je izdat manji broj pakovanja u odnosu na dečake, 4.655 prema 4.832, redom. Najviše je izdavan amoksicilin u kombinaciji sa klavulanskom kiselinom, 3.882 (40,91%), a zatim amoksicilin 1.568 (16,28%), cefalosporini (cefpodoksim, cefprozil, cefiksime), 1.995 (21,03%) i makrolidi (azitromicin, klaritromicin), 504 (5,31%). Antimikrobni lekovi najviše su izdavani u zimskom periodu: januar (1.398 pakovanja), februar (1.060), mart (1.591), što je ukupno 42,68% od ukupno izdatih antimikrobnih lekova u terapiji *Otitis media* u 2017. Od farmaceutskih oblika najviše je izdato sirupa 4.641 (48,92%), tableta 2.849 (30%) i kapsula 447 (4,71%).

Iako se u Nacionalnom vodiču za terapiju *Otitis media* kod dece savetuje amoksicilin kao prva terapijsku liniju, rezultati istraživanja pokazuju da je upotreba amoksicilina sa klavulanskom kiselinom (druga terapijska linija) gotovo tri puta veća. U skladu sa rezultatima, neophodno je unapređenje terapije *Otitis media*. Apoteka „Beograd” sa svojom mrežom od 122 apoteke ima važnu ulogu u očuvanju zdravlja dece i u smanjenju neracionalne upotrebe antimikrobnih lekova.

# ANALYSIS OF THE CONSUMPTION OF ANTIMICROBIAL DRUGS IN THE TREATMENT OF OTITIS MEDIA IN CHILDREN

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*Otitis media* is common term for inflammatory process of the middle ear mucosa and one of the most common diseases in children aged 0-10 years. The aim of this study was proscriptio analysis and evaluation of rational antimicrobial drug use in therapy of *Otitis media* in children under the age of 10.

The source of data was database of dispensed drugs in Pharmacy „Beograd” in 2017. The following data has been extracted for drugs dispensed for diagnoses H65-H69 (ICD-10): ATC class, international non property and brand name, pharmaceutical form, package size, amount of dispensed packages, month of dispensing, and age and gender of child to whom drug has been dispensed.

In total, 9,487 antimicrobial drugpackages was dispensed to children aged 0-10 years, which was 30.61% of the whole number of antimicrobial drug packagesdispensed to the population of all ages. The majority of packages, 8,447 (88%) was dispensed for H65, and much less for H66,965 (10.2%) and H68, 75 boxes (2%). More packages was dispensed to girls than boys, 4,832 vs. 4,655, respectively. Amoxicillinin with clavulanic acid dominated with 3,882 (40.91%) packages, and followed by amoxicillin, 1,568 (16.28%), cephalosporins (cefepodoxime, cefprozil, cefixime), 1,995 (21.03%), and macrolides (clarithromycin, azithromycin), 504 (5,31%). Antimicrobial drugs were mostly dispensed in the winter season: January (1,398 packages), February (1,060), March (1,591), which was 42.68% of antimicrobial drugs dispensed in therapy of *Otitis media* in 2017. Powders for oral suspensions dominated, 4,641 (48.92%), and were followed by tablets, 2,849 (30%), and capsules 447 (4.71%).

In spite of national guideline recommendation of amoxicillin as the first line therapy of *Otitis media* in children, the results pointed out that the use of amoxicillin with clavulanic acid (the second line therapy) was almost three times more. Accordingly, the improvement of *Otitis media* therapy is necessary. Pharmacy „Beograd” with its network of 122 pharmacies, has important role in preserving children’s health and in reducing of irrational antimicrobial drugs use.

## **SAVREMENE MOGUĆNOSTI KONTROLE POTROŠNJE LIJEKOVA SA ESENCIJALNE LISTE U KANTONU SARAJEVO**

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Troškovi lijekova rastu iz godine u godinu i pogađaju mnogo razvijenije zemlje od Bosne i Hercegovine, kao i zemlje regiona. U Kantonu Sarajevo troškovi lijekova sa esencijalne liste su rasli od 2011. do 2016. godine. Mjerama kontrole potrošnje lijekova i racionalizacijom potrošnje lijekova taj trend rasta potrošnje lijekova je zaustavljen u 2016. godini. Cilj ovog rada je ukazati na mogućnosti praćenja i kontrole potrošnje lijekova kroz integralni informacijski sistem, korištenjem „eSmjernica” i VDT funkcije (vremenska dostupnost terapije) iz perspektive platioca.

U ovom radu su korišteni podaci Zavoda zdravstvenog osiguranja Kantona Sarajevo, za period juni 2015. - juni 2016. godine, te metode deskripcije i analize, kao i inovirane eSmjernice i ograničenja u potrošnji lijekova sa esencijalne liste u Kantonu Sarajevo.

Cilj „eSmjernice” je da za primjenjive smjernice sa Liste lijekova automatizuje postavljanje ograničenja prilikom propisivanja i/ili izdavanja lijekova, a sastavni je dio informacionog integralnog sistema pod nazivom „EzOblak” ZZOKS. Efekat primjene „eSmjernice” možemo pokazati na lijeku klopidogrel za period juni 2015. - juni 2016. godine. Potrošnja u junu 2015. godine je iznosila 38.101 KM, u decembru 2015. godine sa 1.525 realizovanih recepata i potrošnjom od 51.220 KM. Primjenom „eSmjernice” može se vidjeti da je broj realizovanih recepata u junu 2016. godine 645 što je za 136% manji broj recepata, sa finansijskim iznosom 19.877 KM. Uspješnost primjene VDT funkcije se može pokazati na primjeru potrošnje po DDD/1000 st./dan za korisnike insulina po polugodištima. Zabilježen je pad potrošnje insulina između istog polugodišta tekuće i prethodne godine, a u finansijskom smislu se ogleđa u protuvrijednosti od cca. 500.000 KM manjeg troška za insulin u tekućem polugodištu, u odnosu na planirani i bez implementacije VDT funkcije.

Pomoću eSmjernica i VDT funkcije se kontrolisala potrošnja lijekova po osiguraniku i ostvarene su znatne finansijske uštede platioca.

# CONTEMPORARY POSSIBILITIES OF CONTROLLING CONSUMPTION OF ESSENTIAL LIST MEDICATIONS IN CANTON SARAJEVO

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Medication expenses have constant rise and affect even more developed country than Bosnia and Herzegovina as well as regional countries. In Canton Sarajevo, expenses of essential list medications from have rise in period 2011-2016 year. With control measures of medication consumption and with rationalization of medication expenses, that rise was blocked in year 2016. Overall aim was to point out increased medication consumption as well to introduce possible mechanisms by which that can be places under control through information integral system, by using „eGuidelines” and TAT (time availability of therapy), from the payer’s perspective.

In this paper, we used data from Institute for Health Insurance Canton Sarajevo (period June 2015 – June 2016), methods, descriptions and analysis as well as innovated guidelines and limitations for consumption of essential list medication in Canton Sarajevo.

Aim of „eGuidelines” was to automatize limitation while prescribing and/or distributing medications. It is part of information integral system named „EzCloud” Institute for Health Insurance Canton Sarajevo. Effect of applied system we can show on clopidogrel for period of one year (June 2015 – June 2016). Consumption of medication in June 2015 was 38.101 BAM, in December, with 1.525 prescribed recipes, was 51.220 BAM. By applying „eGuidelines”, it can be seen that number of recipe in June 2016 was 645 which is 136% less, with financial amount of 19.877 BAM. Success of TVT function can be shown on example of consumption on DDD/1000 ppl/day for insulin dependent patients by semesters. Decrease of insulin consumption was noted between same semester of two years. When talking about finances, we have counter value of cca. 500.000 BAM less expenses for insulin in second semester in comparing to semester without implementation of TVT function.

With help of „eGuidelines” and TVT function we controlled medication consumption on single patient and we have achieved significant financial savings of the payer.

## PROCENA POUZDANOSTI SKALE ZA ISPITIVANJE BIOETIČKIH ASPEKATA ISTRAŽIVANJA FARMACEUTSKE PRAKSE

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U cilju istraživanja bioetičkih aspekata farmaceutske prakse neophodno je da postoje validirani instrumenti (upitnici ili skale) koji će biti fokusirani na iskustvo farmaceuta kao učesnika u istraživanju i stavove u vezi sa informisanošću, autonomijom i poverenjem u istraživače. Cilj ovog istraživanja bio je utvrđivanje pouzdanosti jednog instrumenta - Skale za ispitivanje iskustva i stavova farmaceuta kao učesnika istraživanja u vezi sa etičkim pitanjima u istraživanju farmaceutske prakse.

Sprovedena je studija preseka na prigodnom uzorku farmaceuta zaposlenih u javnim apotekama u Srbiji koji su imali prethodno iskustvo kao učesnici istraživanja. Instrument istraživanja bila je petostepena skala Likertovog tipa, koja se sastojala od 16 stavki sa fokusom na: poverljivost, dobrovoljnost učešća, objektivnost u procesu istraživanja, distancu u odnosu ispitanik - istraživač, informisanu saglasnost, neformalni dogovor između istraživača i ispitanika, informisanost o pravima ispitanika i detaljima istraživačkog protokola. Ocenjivana je pouzdanost ovog instrumenta kroz analizu unutrašnje konzistencije skale, odnosno analizu svojstava i odnosa pitanja unutar testa, kao i analizu pouzdanosti test - retest metodom, utvrđivanja stabilnosti pouzdanosti u vremenu. Unutrašnja konzistentnost instrumenta utvrđivana je računanjem Kronbah alfa koeficijenta pouzdanosti. Test-retest pouzdanost određivana je tako što su ispitanici testirani u dve vremenske tačke istim instrumentom, utvrđivanjem test - retest koeficijenta korelacije između stavki u skali.

U istraživanju je učestvovalo 394 farmaceuta iz privatnih i državnih apoteka. Kronbah alfa koeficijent iznosio je 0,65. Korelacija između skora na skali prilikom prvog zadavanja i skora na skali prilikom drugog zadavanja iznosila je 0,940, a nivo značajnosti je bio 0,01 (test - retest koeficijent). Veća vrednost test - retest koeficijenta pouzdanosti u odnosu na Kronbah alfa koeficijent ukazuje da imamo precizniji test jer je veća proporcija variranja objašnjena pravim rezultatima. S obzirom da je koeficijent Kronbah alfa veći od 0,5 možemo da zaključimo da skala poseduje zadovoljavajuću internu konzistentnost i da stavke skale mere isti koncept.

Rezultati ukazuju na zadovoljavajuću internu konzistentnost instrumenta koji smo testirali, što je potvrđeno visokim test- retest koeficijentom pouzdanosti. Naredna istraživanja, u smislu ispitivanja faktorske strukture ove skale, bila bi očekivana.

# RELIABILITY ASSESSMENT OF A SCALE FOR TESTING BIOETHICAL ASPECTS OF PHARMACEUTICAL PRACTICE RESEARCH

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In order to explore the bioethical aspects of pharmaceutical practice, it is necessary to have validated instruments (questionnaires or scales) that will focus on the pharmacists experience as research participants and pharmacists attitudes regarding information, autonomy and trust in researchers. The aim of this study was to establish the reliability of an instrument - Scale to examine the pharmacists experience and attitudes as research participants on ethical issues in the research of pharmaceutical practice.

A cross-section study was conducted on a convenient sample of pharmacists employed in community pharmacies in Serbia who have had previous experience as research participants. The research instrument was a five-point Likert type scale of 16 items with a focus on: confidentiality, voluntary participation, objectivity in the research process, distance in relation to respondent - researcher, informed consent, informal agreement between researchers and respondents, information on the rights of the respondents and details of the research protocol. The reliability of this instrument was evaluated by analyzing the internal consistency of the scale, that is, the analysis of the characteristics and correlation of the items, as well as the reliability by test - retest method, determining the stability of reliability in time. The internal consistency of the instrument was determined by calculating the Cronbach Alpha reliability coefficient. Test-retest reliability was determined by respondents tested at two time points using the same instrument, by determining the test-retest coefficient of correlation between the items in the scale.

394 pharmacists from private and state pharmacies participated. The Cronbach Alpha coefficient was 0.65. Correlations between the score on the scale during the first testing and the score on the scale during the second testing was 0.940, significance level 0.01 (test - retest coefficient). The higher value of the test - retest coefficient reliability compared to the Cronbach alpha coefficient reliability indicates that we have a more precise test because a greater proportion of variation is explained by the right results. Since the Cronbach alpha coefficient is greater than 0.5, we can conclude that the scale has a satisfactory internal consistency and that the items in the scale measure the same concept.

The results indicate a satisfactory internal consistency of the scale, which was confirmed by the highest - retest reliability coefficient. The following researches in terms of examination of factor structure of scale would be expected.

## **KONTINUIRANA EDUKACIJA FARMACEUTA - OD STAVOVA KA ISHODIMA PROFESIONALNE PRAKSE**

**Sladana Tanasković, Ljiljana Tasić**

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Kontinuirana edukacija je uvedena kao obaveza svih farmaceuta radi ostvarivanja novih kompetencija koje se stavljaju pred ove zdravstvene profesionalce u savremenom društvu. Programi KE su vrednovani KME bodovima u zavisnosti od obima sadržaja i omogućavaju produžavanje licenci za rad farmaceuta, koja se obravlja na svakih sedam godina. Cilj studije je da se ispitaju stavovi farmaceuta o programima kontinuirane edukacije po kome se profesionalno usavršavaju farmaceuti zaposleni u apotekama, i ostvareni ishodi, i predlože mere za unapređenje programa KE.

U maju 2018. godine sprovedeno je istraživanje tokom kog je diplomiranim farmaceutima distribuiran upitnik namenski kreiran prema ciljevima istraživanja. Popunjavanje upitnika bilo je anonimno i dobrovoljno. Prikupljeni su socio-demografski podaci, i podaci o njihovom stavu prema temama, programima i korisnostima KE kao i predlozima za unapređenje. Obrada podataka rađena je upotrebom SPSS softvera (deskriptivna statistika).

U istraživanju je učestvovalo 112 farmaceuta koji su popunili upitnik. Više od polovine učesnika istraživanja, 73,9% je mišljenja da su KE veoma korisne za njihov profesionalni razvoj. Trećina ispitanika (34,8% ) smatra da se dosta stečenog znanja na kursevima kontinuirane edukacije može primeniti u praksi. Više od polovine (69,57%) se opredelilo za teme o najnovijim saznanjima o već dobro poznatim lekovima, kao najkorisnije teme za KE.

Farmaceuti imaju veoma pozitivan stav o kontinuiranom usavršavanju stoga se adekvatnim izborom tema doprinos ovog vida profesionalnog usavršavanja može značajno poboljšati a time i farmaceutske usluge unaprediti.

# CONTINUING EDUCATION OF PHARMACISTS- FROM ATTITUDES TO OUTCOMES OF PROFESSIONAL PRACTICE

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Continuing education has been introduced as an obligation of all pharmacists in order to realize new competencies that are placed before these health professionals in the modern age. In order to increase motivation, programs are evaluated against the volume of content and allow the extension of licenses for the work of pharmacists every seven years. The aim of the study was to examine the attitudes of pharmacists about continuing education programs which are used for professional training of pharmacists, the results achieved, and proposing measures for the improvement of these programs.

Study was performed during the May, 2018. The questionnaire, specially designed according to aims of the study, was distributed to pharmacists. Participation in the study was anonymous and voluntarily. Socio-demographic data on pharmacists have been collected, as well as data on their attitude towards the topics and usefulness of continuing education, as well as suggestions for improvement. Data processing was done using SPSS software

The survey involved 112 pharmacists who completed the questionnaire. More than half of the research participants, 73.9% believe that continuous education is very useful for their professional development. A total of 34.8% of the total number of pharmacists surveyed believes that a lot of acquired knowledge in continuing education courses can be applied in practice. More than half of them, 69.57%, have chosen topics on the latest knowledge about already used drugs as the most useful.

The pharmacists have a very positive attitude to continuous improvement, thereby contributing to this type of professional development with an adequate choice of topics can significantly improve and thus improve pharmaceutical services.

## **INTERPROFESIONALNO OBRAZOVANJE STUDENATA ZDRAVSTVENIH NAUKA - PRVA ISKUSTVA NA UNIVERZITETU U BEOGRADU**

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Interprofesionalno obrazovanje (IPO) predstavlja jednu od ključnih reformi u obrazovanju zdravstvenih profesionalaca preporučenih u cilju jačanja zdravstvenog sistema. Ovaj važan pedagoški pristup razvija zdravstvene profesionalce za pružanje zdravstvene zaštite u zajedničkom okruženju, budući da interprofesionalni timovi poboljšavaju kvalitet pružene zdravstvene usluge, smanjuju finansijske troškove lečenja i umanjuju mogućnost medicinske greške.

U ovom radu predstavljamo prvo iskustvo IPO na fakultetima zdravstvenih nauka Univerziteta u Beogradu. Zajednički izborni predmet „Interprofesionalno obrazovanje” realizovan je na Medicinskom fakultetu, Farmaceutskom fakultetu i Stomatološkom fakultetu tokom školske 2017/2018 godine. Nastavu je pohađalo ukupno 69 studenata sa četiri studijska programa: Medicina (10), Farmacija (26), Dentalna Medicina (17) i Sestrinstvo (16). Interprofesionalne grupe studenata (n=6) sastojale su se od studenata završnih godina navedenih zdravstvenih profilakoji imaju specifična znanja, veštine i sposobnosti. Nastava je organizovana on-line (e-platforma) i on-site u okviru radionica. Na tri radionice, interprofesionalni timovi studenata razmatrali su kliničke slučajeve pacijenta sa akutnim koronarnim sindromom, pacijenta sa dijabetesom i slučaj gerijatrijskog pacijenta. Radionice su vodili moderatori - nastavnici i saradnici sva tri fakulteta.

Praćenjem procesa nastave i evaluacije studenata zapaženo je da su studenti bili veoma zainteresovani za ovakav vid učenja, ali bi trebalo da se bolje pripreme za radionice(deo nastave na e-platformi) jer IPO zahteva efikasnu komunikaciju, jasno razumevanje uloga i dinamike tima, kao i sposobnost za efikasno rešavanje konflikta. Inteprofesionalne grupe studenata su sumirale svoja zapažanja i ekspertizu karakterističnu za svoju profesiju i komunicirale kao tim za pružanje optimalne nege pacijenta u svakom analiziranom kliničkom slučaju. Međutim, pojedini nastavnici u ulozi moderatora izveli su individualne procene pacijenta što ne predstavlja IPO. Ova iskustva ukazuju na buduće korake razvoja IPO na Univerzitetu u Beogradu u smislu edukacije moderatora radionica i boljeg razumevanjakoncepta i cilja IPO.

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## **INTERPROFESSIONAL EDUCATION OF HEALTH SCIENCES STUDENTS - THE FIRST EXPERIENCE AT THE UNIVERSITY OF BELGRADE**

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Interprofessional education (IPE) is one of the key health education reforms recommended to strengthen health systems. It is an important pedagogical approach to develop health sciences students to provide patient care in a collaborative team environment. Interprofessional teams enhance the quality of patient care, lower costs, and reduce medical errors.

In this paper, we present the first experience of IPE at the faculties of health sciences of University of Belgrade. The joint elective subject „Interprofessional education” was conducted at the Faculty of Medicine, Faculty of Pharmacy and School of Dental Medicine during the school year 2017/2018. The subject was attended by a total of 69 students from the four study programs: Medicine (10), Pharmacy (26), Dental Medicine (17) and Nursing (16). Interprofessional student groups (n=6) were composed of students from the different study programs who have specialized knowledge, skills, and abilities. Teaching and learning was organized on-line (e-platform) and on-situ through joint workshops. In three workshops, students examined clinical cases of a patient with acute coronary syndrome, a patient with diabetes, and a geriatric patient case. The workshops were facilitated by academic staffs of all three faculties.

Through monitoring of the process of teaching and evaluation of students, it was observed that students were very interested in this type of learning, but should be better prepared for the workshop because interprofessional practice requires effective communication, clear understanding of roles and team dynamics, as well as ability to effectively resolve conflict. Interprofessional student groups were synthesizing their observations and profession-specific expertise to collaborate and communicate as a team for optimal patient care in each clinical case considered. However, some teachers in the role of facilitators carried out individual assessments of a patient that does not represent an interprofessional education. These experiences indicate future steps of development of IPE at the University of Belgrade in terms of educating facilitators and better understanding of concept and goal of IPE.

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## UNAPREĐENJE NASTAVNIČKIH I MENTORSKIH KOMPETENCIJA ZA OBRAZOVANJE ZDRAVSTVENIH PROFESIONALACA: RAZVOJ ZAJEDNIČKOG PROGRAMA KONTINUIRANE EDUKACIJE NASTAVNIKA I SARADNIKA ZDRAVSTVENIH NAUKA

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Razvoj nastavničkih kompetencija predstavlja značajan aspekt kontinuiranog profesionalnog razvoja nastavnika fakulteta i mentora iz prakse uključenih u obrazovanje zdravstvenih profesionalaca. Aktuelni standardi za obezbeđenje kvaliteta zahtevaju da nastavnom osoblju mora biti obezbeđen pristup programima profesionalnog razvoja usmerenim na razvoj nastavničkih kompetencija, poznavanje osnovnih pedagoških principa, razvoj i realizaciju studijskih programa. Razvoj nastavničkih kompetencija nastavnika fakulteta i mentora iz prakse, uključujući i razvoj programa za unapređenje nastavničkih kompetencija, bio je jedan od glavnih ciljeva Erasmus+ projekta ReFEEHS čiji je koordinator Univerzitet u Beogradu, a partneri Univerzitet u Kragujevcu, Univerzitet u Novom Sadu, Univerzitet u Nišu, i četiri EU univerziteta, Triniti koledž Dablin, Univerzitet u Lisabonu, Univerzitet u Pečuju i Medicinski univerzitet u Sofiji (<http://refeehs.com/>).

Program za unapređenje nastavničkih i mentorskih kompetencija za obrazovanje zdravstvenih profesionalaca razvijen je kao kurs kombinovanog učenja kroz *on-line* aktivnosti i susrete uživo koji se sastoji iz pet modula i obrađuje teme kao što su: učenje, podučavanje i procena znanja u akademskom i kliničkom okruženju, primena informacionih tehnologija u nastavi, obezbeđenje kvaliteta u obrazovanju zdravstvenih profesionalaca. Program je razvijen i akreditovan kao zajednički program za kontinuirani profesionalni razvoj nastavnika fakulteta i mentora iz prakse za sva četiri domaća univerziteta. Cilj razvoja programa je doprinose uvođenju inovacijai transformaciji obrazovanja zdravstvenih profesionalaca kako bi se obezbedio efektivan i interaktivan nastavni proces sa studentima i pacijentima u centru pažnje. Prva grupa od 40 polaznika upisana je u februaru 2018. godine. Grupa je sastavljena od 47,5% asistenata, 37,5% docenata, 10% profesora i 5% mentora iz prakse koji učestvuju u obrazovanje doktora medicine (45%), magistara farmacije (35%) i doktora dentalne medicine (20%). Održano je šest radionica sa internacionalnim učešćem, koje su praćene odgovarajućim *on-line* sadržajima, uključujući domaće zadatke u elektronskom obliku i *on-line* forume. Pozitivni komentari pristigli su i od učesnika, kao i od nastavnika odgovornih za organizaciju i realizaciju programa. Naredne aktivnosti će biti usmerene na održivost programa i evaluaciju dugotrajnih efekata ove inicijative.

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## **TEACHING CERTIFICATE IN HEALTH PROFESSIONS EDUCATION: JOINT CURRICULUM DEVELOPMENT**

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Teaching competencies development is an important part of continuing professional development of academic staff and practitioners involved in health professions education. Contemporary quality assurance standards require that teaching staff must have access to a professional development programme, which provides opportunities to develop teaching, learning and assessment skills, the understanding of pedagogy, construction and the delivery of a curriculum. Teaching Competencies Development of academic staff and teacher practitioners, including introduction of Teaching Certificate study programme was one of the principal goals of the current Erasmus+ project ReFEEHS which is coordinated by the University of Belgrade in cooperation with University of Kragujevac, University of Niš, University of Novi Sad, and four EU universities, Trinity College Dublin, University of Lisbon, University of Pécs and Medical University of Sofia (<http://refeehs.com/>).

The Teaching Certificate study programme in Health Professions Education has been designed as a blended learning course consisting of five modules covering topics related to: teaching, learning and assessment in academic and clinical settings; technology enhanced teaching, and quality assurance in health professions education. It has been developed as a joint curriculum of the four Serbian universities, and accredited as the continuing professional development program for academic staff and teacher practitioners with the aim to contribute to the innovation and transformation of health professionals' education towards a more effective, interactive student-centered and patient-centered approach. The first cohort of 40 participants enrolled in February, 2018. They comprised 47.5% teaching - clinical assistants, 37.5% assistant professors, 10% professors and 5% healthcare practitioners engaged in medical (45%), pharmacy (35%) or dental medicine (20%) education. Six face-to-face workshops with international participation were held, complemented by different on-line activities, including e-assignments and on-line forums. Positive feedback has been received from both the participants and the academic staff responsible for programme organization and delivery. Further activities will be focused on the sustainability and evaluation of the long-term impact of this initiative.

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