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Prijedor, 23 – 24. jun 2023. godine

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Predgovor

Zbornik sažetaka „Znanjem do zdravlja – SANUS 2023“ nastao je iz saopštenja koja su pripremljena za 2. Međunarodnu naučnu konferenciju iz područja zdravstvenih i srodnih nauka u organizaciji Visoke medicinske škole Prijedor, od 23. do 24. juna 2023. godine.

Zbornik obuhvata 77 sažetaka i započinje sažecima *plenarnih predavanja* koja su se bavila vrlo zanimljivim i aktuelnim temama kao što su mogućnosti i prevencija liječenja gojaznosti i dijabetesa Tip 2, bioaktivnim supstancama u grožđu i pitanjima umjerenog konzumiranja vina, te terapijskom praćenju antibakterijskih lijekova. Slijede zanimljivi sažeci sa *pozvanih predavanja* koja obuhvataju različite teme a koje će biti izložene u sklopu 6 tematskih sesija. Pri uređivanju Zbornika sažetaka, uređivački odbor razvrstao je radove *prema temama* iz oblasti Zdravstvene njege, Fizioterapije, Radne terapije, Medicinsko-laboratorijskog inženjerstva i Sanitarnog inženjerstva. Na kraju, u okviru *studentske sekcije* obuhvaćeni su sažeci pisani u koautorstvu studenata, gdje Zbornik predstavlja idealan medijum za uvođenje studenata u naučnoistraživački rad, da ih motiviše i ohrabruje na bavljenje istraživačkim radom.

Posebno bogatstvo Konferencije „Znanjem do zdravlja“ je upravo tematska raznolikost, koja pokriva različita područja povezana sa zdravljem, od fizioterapijskih tema, preko tema vezanih za bezbjednost hrane, pitanja suplemenata, tema iz temeljnih biomedicinskih nauka, pa sve do neiscrpne teme fizičke aktivnosti i neaktivnosti i dr.

Najsrdačnije zahvaljujemo svim autorima radova, suorganizatorima, pokroviteljima, institucijama i svim drugima koji su na bilo koji način doprinijeli održavanju ove Konferencije i štampanju Zbornika.

Prijedor, jun 2023. godine

Naučni odbor konferencije

Preface

The collection of abstracts "Knowledge to Health - SANUS 2023" was created from the announcements prepared for the 2nd International Scientific Conference in the field of health and related sciences, organized by the College of Health Sciences Prijedor, from June 23 to 24, 2023.

The collection includes 77 abstracts and begins with summaries of plenary lectures that dealt with very interesting and current topics such as the possibilities and prevention of treatment of obesity and type 2 diabetes, bioactive substances in grapes and issues of moderate wine consumption, and therapeutic monitoring of antibacterial drugs. The following are interesting summaries of keynote speakers covering various topics, which will be presented in 6 thematic sessions. When editing the Collection of Abstracts, the editorial board classified the papers according to topics from the fields of Health Care, Physiotherapy, Occupational Therapy, Medical Laboratory Engineering and Sanitary Engineering. Finally, the student section includes summaries written in co-authorship by students, where the Collection represents an ideal medium for introducing students to scientific research work, to motivate and encourage them to engage in research work.

The special wealth of the "Knowledge to Health" Conference is precisely the thematic diversity, which covers various areas related to health, from physiotherapy topics, through topics related to food safety, issues of supplements, topics from basic biomedical sciences, and all the way to the inexhaustible topic of physical activity and inactivity, etc.

We sincerely thank all the authors of the papers, co-organizers, sponsors, institutions and all others who in any way contributed to the holding of this Conference and the printing of the Proceedings.

Prijedor, June 2023 Scientific Committee of the Conference

Sadržaj/Content

PLENARNA PREDAVANJA/PLENARY LECTURES 1

GOJAZNOST I TIP 2 DIJABETESA-MOGUĆNOSTI PREVENCIJE I LIJEČENJA 3

OBESITY AND TYPE 2 DIABETES-POSSIBILITIES OF PREVENTION AND TREATMENT 4

BIOAKTIVNE SUPSTANCE GROŽĐA I PITANJE UMJERENOG KONZUMIRANJA VINA 5

BIOACTIVE SUBSTANCES OF GRAPES AND MODERATE WINE CONSUMPTION 6

TERAPIJSKO PRAĆENJE ANTIBAKTERIJSKIH LEKOVA 7

THERAPEUTIC DRUG MONITORING OF ANTIMICROBIALS 8

PREDAVANJA PO POZIVU/(SEKCIJSKO PREDAVANJE)/LECTURES BY INVITATION (SECTION LECTURE) 9

OČEKIVANJA MLADIH OD SESTRINSKE PROFESIJE 11

YOUNG PEOPLE'S EXPECTATIONS OF THE NURSING PROFESSION 12

FIZIKALNA TERAPIJA PACIJENATA S UGRAĐENIM ENDOPROTEZAMA ZGLOBOVA 13

PHYSICAL THERAPY OF PATIENTS WITH IMPLEMENTED ENDOPROSTHESES OF JOINTS 15

TIMSKI RAD U REHABILITACIJI 17

TEAM WORK IN REHABILITATION 18

ULOGA RADNOG TERAPEUTA U PROCESU INKLUZIJE 19

ROLE OF AN OCCUPATIONAL THERAPIST IN THE PROCESS OF INCLUSION 20

MOGUĆNOST UPOTREBE VEŠTAČKE INTELIGENCIJE U OKUPACIONOJ TERAPIJI 21

THE POSSIBILITY OF USING ARTIFICIAL INTELLIGENCE IN OCCUPATION THERAPY 22

TROMBOFILIJA U PEDIJATRIJSKOM UZRASTU 23

THROMBOPHILIA IN PEDIATRIC AGE 24

VALORIZACIJA OTPADA OD HRANE U SVRHU SMANJENJA UTICAJA NA ŽIVOTNU SREDINU I ZDRAVLJE LJUDI 25

RECOVERY OF FOOD WASTE FOR THE PURPOSE OF REDUCING THE IMPACT ON THE ENVIRONMENT AND HUMAN HEALTH 26

UTICAJ ČIŠĆENJA I DEZINFEKCIJE U PROIZVODNIM POGONIMA NA MIKROBIOLOŠKI KVALITET HRANE 27

INFLUENCE OF CLEANING AND DISINFECTION IN PRODUCTION FACILITIES ON THE MICROBIOLOGICAL QUALITY OF FOOD 28

ZDRAVSTVENA NJEGA/HEALTH CARE 29

NEKI POKAZATELJI ZDRAVSTVENOG STANJA STANOVNIŠTVA REPUBLIKE SRPSKE 31

SOME INDICATORS OF THE HEALTH STATUS OF THE POPULATION OF THE REPUBLIC OF SRPSKA 32

DISC KOMUNIKACIJSKI MODEL- PRIMJENA U SESTRINSKOJ PRAKSI 33

DISC COMMUNICATION MODEL- APPLICATION IN NURSING PRACTIE. 34

SOCIOLOŠKI ASPEKTI SMANJENE FIZIČKE AKTIVNOSTI KOD OSOBA STARIJE ŽIVOTNE DOBI 35

SOCIOLOGICAL ASPECTS OF REDUCED PHYSICAL ACTIVITY IN ELDERLY PERSONS 36

EVALUACIJA INSTRUMENATA ZA IDENTIFIKACIJU KOGNITIVNIH OŠTEĆENJA KOD STARIH OSOBA 37

EVALUATION OF INSTRUMENTS FOR THE IDENTIFICATION OF COGNITIVE IMPAIRMENTS IN ELDERLY PEOPLE 38

ZDRAVSTVENA NJEGA BOLESNIKA SA TEŠKIM NAPADOM BRONHIJALNE ASTME 39

HEALTH CARE OF PATIENTS WITH A SEVERE ATTACK OF BRONCHIAL ASTHMA 40

UTICAJ EDUKACIJE NA KVALITET ŽIVOTA OSOBA KOJE ŽIVE SA DIJABETESOM TIP 2 41

IMPACT OF EDUCATION ON THE QUALITY OF LIFE OF PERSONS LIVING WITH TYPE 2 DIABETES 42

DIJABETSKO STOPALO KAO MANIFESTACIJA VIŠESTRUKIH KOMPLIKACIJA ŠEĆERNE BOLESTI 43

DIABETIC FOOT AS A MANIFESTATION OF MULTIPLE DIABETES COMPLICATIONS 44

ANKSIOZNI I DEPRESIVNI POREMEĆAJI DJECE I ADOLESCENATA 45
ANXIETY AND DEPRESSIVE DISORDERS IN CHILDREN AND ADOLESCENTS 46
IZAZOVI I BUDUĆNOST SESTRINSTVA 47
CHALLENGES AND THE FUTURE OF NURSING 48
ANALIZA POVREDA UZROKOVANIH SAOBRAĆAJNIM TRAUMATIZMOM U POPULACIJI DJECE I ADOLESCENATA LIJEČENIH U SLUŽBAMA HITNE MEDICINSKE POMOĆI 49
ANALYSIS OF INJURIES CAUSED BY TRAFFIC TRAUMA IN THE POPULATION OF CHILDREN AND ADOLESCENTS TREATED IN EMERGENCY MEDICAL SERVICES 50
TRETMAN HRONIČNOG LUMBOSARKALNOG SINDROMA 51
TREATMENT OF CHRONIC LUMBOSACRAL SYNDROME 52
ANTIMIKROBNI, CITOTOKSIČNI I EFEKAT NA ZARASTANJE RANA ČETIRI BIS-BIBENZILA IZOLOVANA IZ JETRENJAČA 53
ANTIMICROBIAL, CYTOTOXIC AND WOUND HEALING EFFECTS OF FOUR BIS-BIBENZYLS ISOLATED FROM LIVERWORTS 54
FUNKCIONALNA VEZA HALLUX VALGUS UGLOVA HVU I IMU PRIJE I POSLIJE OPERATIVNOG LIJEČENJA 55
FUNCTIONAL RELATIONSHIP OF INTERMETATARSAL AND HALLUX VALGUS ANGLE BEFORE AND AFTER OPERATIVE TREATMENT 56
FIZIOTERAPIJA/PHYSIOTHERAPY 57
SNAGA ČETVOROGLAVOG MIŠIĆA BUTA NAKON REKONSTRUKCIJE PREDNJEG UKRŠTENOG LIGAMENTA 59
QUADRICEPS MUSCLE STRENGTH AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION 60
PERIARTHRITIS HUMEROSCAPULARIS –PRIKAZ SLUČAJA 61
PERIARTHRITIS HUMEROSCAPULARIS– CASE STUDY 62
EVALUACIJA PRIMJENE STANDARDIZOVANIH TESTOVA ZA PROCJENU FUNKCIONALNOG STANJA OSOBA NAKON MOŽDANOG UDARA 63
EVALUATION OF THE APPLICATION OF STANDARDIZED TESTS FOR ASSESSING THE FUNCTIONAL STATE OF PEOPLE AFTER A STROKE 64
UTICAJ KINEZITERAPIJE NA FIZIČKU AKTIVNOST U TRUDNOĆI 65
INFLUENCE OF PHYSIOTHERAPY ON PHYSICAL ACTIVITY IN PREGNANCY 66

ZDRAVSTVENI ASPEKTI VJEŽBANJA I TRENAŽNOG PROCESA SPORTISTA SA INVALIDITETOM 67

HEALTH ASPECTS OF EXERCISE AND TRAINING PROCESS OF ATHLETES WITH DISABILITIES 68

DIJAGNOSTIKA I LIJEČENJE „ZEBRIS“ APARATOM U FIZIOTERAPIJI 69

DIAGNOSIS AND TREATMENT USING “ZEBRIS” DEVICE IN PHYSIOTHERAPY 70

MOGUĆNOSTI KORIŠTENJA PROTEINA SURUTKE KAO SUPLEMENATA U ISHRANI SPORTISTA 71

POSSIBILITIES OF USING WHEY PROTEIN AS SUPPLEMENTS IN THE NUTRITION OF ATHLETES..... 72

FIZIOTERAPIJA U ONKOLOGIJI – IZAZOV I PRILIKA 73

PHYSIOTHERAPY IN ONCOLOGY- CHALLENGES AND OPPORTUNITIES 74

RADNA TERAPIJA/OCCUPATIONAL THERAPY 75

PRAKSA TEMELJENA NA DOKAZIMA U RADNOJ TERAPIJI 77

EVIDENCE BASED PRACTICE IN OCCUPATIONAL THERAPY 78

UPOTREBA KOHLMANOVE PROCJENE ŽIVOTNIH VJEŠTINA U SLOVENIJI..... 79

APPLYING THE KOHLMAN EVALUATION OF LIVING SKILLS IN SLOVENIA..... 80

PRIMJENA SOMATO-PSIHO-SOCIO-SEMNIOTIČKIH OKVIRA U RADNOJ TERAPIJI KROZ PARADIGMU HOLISTIČKE SKRBI ZA BOLESNIKA..... 81

APPLICATION OF THE SOMATO-PSHO-SOCIO-SEMNIOTIC FRAMEWORK IN OCCUPATIONAL THERAPY THROUGH THE PARADIGM OF HOLISTIC CARE..... 82

SJEDENJE - PROBLEM JAVNOG ZDRAVLJA 83

SITTING - A PUBLIC HEALTH PROBLEM..... 84

ZDRAVO STARENJE I RADNA TERAPIJA 85

HEALTHY AGING AND OCCUPATIONAL THERAPY 86

STRAH OD PADA KAO FAKTOR RIZIKA ZA PAD KOD STARIJE POPULACIJE..... 87

FEAR OF FALLING AS A RISK FACTOR FOR FALLS IN THE ELDERLY POPULATION 88

RADNA TERAPIJA DJECE SA PARALIZOM PLEXUS BRACHIALISA..... 89

OCCUPATIONAL THERAPY OF CHILDREN WITH PLEXUS BRACHIALIS PARALYSIS 90

STAVOVI STUDENATA PRVE GODINE STUDIJSKOG PROGRAMA STRUKOVNI RADNI TERAPEUT O OSOBAMA SA INVALIDITETOM 91

ATTITUDES OF STUDENTS IN THE FIRST YEAR OF STUDY FOR THE PROFESSIONAL OCCUPATIONAL THERAPIST ABOUT PEOPLE WITH DISABILITIES 91

UNAPREĐENJE KVALITETA USLUGA OKUPACIONE TERAPIJE U CENTRIMA ZA MENTALNO ZDRAVLJE U REPUBLICI SRPSKOJ 92

IMPROVING THE QUALITY OF OCCUPATIONAL THERAPY SERVICES IN MENTAL HEALTH CENTERS IN THE REPUBLIC OF SRPSKA 92

RADNA TERAPIJA I PERINATALNO MENTALNO ZDRAVLJE 93

OCCUPATIONAL THERAPY AND PERINATAL MENTAL HEALTH 94

OSNAŽIVANJE PREDAVAČA ZA IZAZOVE RADNOG MJESTA 95

EMPOWERMENT OF LECTURERS FOR WORKPLACE CHALLENGES 96

KOMPETENCIJE NASTAVNIKA RAZREDNE NASTAVE ZA INKLUZIVNO OBRAZOVANJE 97

COMPETENCIES FOR INCLUSIVE EDUCATION OF CLASS TEACHERS ... 98

PORODICE SA DECOM SA SMETNJAMA U RAZVOJU – KAKO DO OPTIMALNOG KVALITETA ŽIVOTA? 99

FAMILIES WITH CHILDREN WITH DISABILITIES - HOW TO ACHIEVE OPTIMAL QUALITY OF LIFE? 100

SANITARNO INŽENJERSTVO/SANITARY ENGINEERING 101

MIKROBIOLOŠKI KVALITET I NAJČEŠĆI KONTAMINANTI HRANE 103

MICROBIOLOGICAL QUALITY AND THE MOST COMMON FOOD CONTAMINANTS 104

UZORKOVANJE BRISOM SA POVRŠINA I OPORAVAK *ESCHERICHIA COLI* 105

SURFACE SWAB SAMPLING AND RECOVERY OF *ESCHERICHIA COLI* . 106

ANTIBAKTERIJSKA AKTIVNOST *Allium ursinum* L. 107

ANTIBACTERIAL ACTIVITY OF *Allium ursinum* L 108

UTICAJ GRANICE ODREĐIVANJA NA POZITIVAN NALAZ *LISTERIA MONOCYTOGENES* U UZORCIMA MLIJEKA 109

THE IMPACT OF LEVEL OF DETECTION ON POSITIVE FINDING OF *LISTERIA MONOCYTOGENES* IN MILK 110

KULTURA ISHRANE U HERCEGOVINI U KASNOM SREDNJEM VIJEKU. 111

FOOD CULTURE IN HERZEGOVINA IN THE LATE MIDDLE AGES 112

PROMJENE VISKOZITETA KRAVLJEG I SOJINOG JOGURTA TOKOM SKLADIŠTENJA UZ PRIMJENU INULINA 113

CHANGES IN THE VISCOSITY OF COW AND SOY YOGURT DURING STORAGE WITH THE APPLICATION OF INULIN 114

OCJENJIVANJE SENZORNIH KARAKTERISTIKA I ZDRAVSTVENE BEZBJEDNOSTI PROIZVODA OD MESA KOKOŠAKA 115

EVALUATION OF SENSORY CHARACTERISTICS AND HEALTH SAFETY OF CHICKEN MEAT PRODUCTS..... 116

PROCJENA UKUPNOG SADRŽAJA FLAVONOIDA, ANTIOKSIDATIVNE AKTIVNOSTI I BOJE RAZLIČITIH UZORAKA MEDA 117

ASSESSMENT OF TOTAL FLAVONOID CONTENT, ANTIOXIDANT ACTIVITY AND COLOR OF DIFFERENT HONEY SAMPLES 118

PREHRAMBENI PROIZVODI SA POTENCIJALOM GEOGRAFSKIH OZNAKA U BOSNI I HERCEGOVINI 119

FOOD PRODUCTS WITH THE POTENTIAL OF GEOGRAPHICAL INDICATIONS IN BOSNIA AND HERZEGOVINA..... 120

ALTERNATIVNA PŠENICA SPELTA (*TRITICUM SPELTA L.)* 121

ALTERNATIVE WHEAT SPELT (TRITICUM SPELTA L.)..... 122

DENTALNE FOBIJE KAO FAKTOR RIZIKA ORALNOG ZDRAVLJA ODRASLIH OSOBA..... 124

DENTAL PHOBIAS AS A RISK FACTOR FOR ORAL HEALTH IN ADULTS 124

ZDRAVSTVENA ULOGA ŠUMA U VREMENU POSTKOVID OPORAVKA ..... .125

THE HEALTH ROLE OF FORESTS IN THE TIME OF POST-COVID RECOVERY 126

EKOLOŠKE POSLJEDICE POJAVE KATASTROFA UZROKOVANIH ELEMENTARNIM NEPOGODAMA I MJERE ZAŠTITE 127

ENVIRONMENTAL CONSEQUENCES OF DISASTERS CAUSED BY ELEMENTARY DISADVANTAGES AND PROTECTION MEASURES 128

INDIKATORI EFIKASNOSTI SISTEMA UPRAVLJANJA U PREDUZEĆIMA PREHRAMBENE INDUSTRIJE 129

INDICATORS OF EFFICIENCY OF MANAGEMENT SYSTEM IN FOOD INDUSTRY COMPANIES 130

DEZINFEKCIJA BOLNIČKE SREDINE TOKOM KOVID PANDEMIJE: STUDIJA JEDNOG CENTRA 131

DISINFECTION OF THE HOSPITAL ENVIRONMENT DURING THE COVID PANDEMIC: A SINGLE CENTER STUDY 132

IMAMO LI PREVIŠE BUKE U OBRAZOVNIM USTANOVAMA? 133

DO WE HAVE TOO MUCH NOISE IN EDUCATIONAL ESTABLISHMENTS? 134

POREĐENJE FUNGICIDNOG DEJSTVA EKSTRAKATA PROPOLISA I METRONIZADOLA 135

COMPARISON OF FUNGICIDAL EFFECT OF PROPOLIS EXTRACTS AND METRONIDAZOLE 136

MEDICINSKO-LABORATORIJSKO INŽENJERSTVO/MEDICAL LABORATORY ENGINEERING 137

SAVREMENI TRENDOVI U UNAPREĐENJU SISTEMA UPRAVLJANJA KVALITETOM U HEMIJSKOJ LABORATORIJI 139

CONTEMPORARY TRENDS IN THE IMPROVEMENT OF QUALITY MANAGEMENT SYSTEMS IN CHEMICAL LABORATORIES 140

ZNAČAJ DOBRE LABORATORIJSKE PRAKSE U LABORATORIJAMA VISOKE MEDICINSKE ŠKOLE PRIJEDOR 141

APPLICATION OF THE PRINCIPLES OF GOOD LABORATORY PRACTICE IN THE LABORATORIES OF THE COLLEGE OF HEALTH SCIENCE PRIJEDOR 142

MIKROBIOM ČOVEKA U ZDRAVLJU I BOLESTI 143

THE HUMAN MICROBIOME IN HEALTH AND DISEASE 144

ISPITIVANJE UTICAJA HLADNE ATMOSFERSKE PLAZME NA PROTEINE GLUTENA IZ BEZGLUTENSKOG BRAŠNA GCE METODOM 145

EXAMINATION OF THE EFFECT OF COLD ATMOSPHERIC PLASMA ON GLUTEN PROTEINS FROM GLUTEN-FREE FLOUR BY GCE METHOD 146

RIJETKE RHD VARIJANTE KOD DAVALACA KRVI 147

RARE *RHD* VARIANTS IN BLOOD DONORS 148

INCIDENCIJA *CLOSTRIDIUM DIFFICILE* INFEKCIJA KOD PACIJENATA SA DIJAREJOM U BOLNICI ZA TERCIJARNU NJEGU 149

INCIDENCE OF *CLOSTRIDIUM DIFFICILE* INFECTION IN PATIENTS WITH DIARRHEA IN A TERTIARY CARE HOSPITAL 150

EFIKASNOST BIOCIDA U ERADIKACIJI *ACINETOBACTER BAUMANNII* BIOFILMA 151

THE POTENTIAL OF DIFFERENT BIOCIDES IN ERADICATION OF MATURE *ACINETOBACTER BAUMANNII* BIOFILM..... 152

STUDENTSKI RADOVI/STUDENT PAPERS 153

REHABILITACIJA BOLESNIKA NAKON AKUTNOG INFARKTA MIOKARDA..... 155

REHABILITATION OF PATIENTS AFTER ACUTE MYOCARDIAL INFARCTION 156

INKLUZIJA INVALIDNIH OSOBA U DRUŠTVO 157

INCLUSION OF DISABLED PERSONS IN SOCIETY..... 158

RIZIKO FAKTORI NA KOJE MOŽEMO UTICATI..... 159

RISK FACTORS THAT WE CAN INFLUENCE 160

PREVENCIJA NA NIVOU PRIMARNE ZDRAVSTVENE ZAŠTITE 161

PREVENTION AT THE LEVEL OF PRIMARY HEALTH CARE 162

TRADICIONALNA UPOTREBA *CANNABIS SATIVA L*. NA BALKANU..... 163

TRADITIONAL USE OF HEMP (*Cannabis sativa* L.) IN THE BALKANS 164

PRIMJENA ALLIUM TESTA ZA ISPITIVANJE KVALITETA VODE SA RAZLIČITIH LOKALITETA 165

APPLICATION OF THE ALLIUM TEST FOR EXAMINATION THE QUALITY OF WATER FROM DIFFERENT LOCATIONS..... 166

KOMUNIKACIJA U ZDRAVSTVU..... 167

COMMUNICATION IN HEALTHCARE..... 168

PLENARNA PREDAVANJA

PLENARY LECTURES

PL-1

GOJAZNOST I TIP 2 DIJABETESA -MOGUĆNOSTI PREVENCIJE I LIJEČENJA

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Sažetak: Gojaznost i tip 2 dijabetesa (T2D) predstavljaju dvije povezane pandemije.Više od 90% oboljelih od T2D imaju prekomjernu tjelesnu težinu ili su gojazni. Pandemiji gojaznosti pogoduju mnogobrojni činioci, ali se smatra da su biološki razlozi (genetika, epigenetika čovjeka) sa jedne strane, a način života sa druge strane od odlučujuće važnosti za nastanak gojaznosti. Promjene stila života koji uzrokuju gojaznost nastaju pod uticajem snažnih socijalnih, kulturnih i ekonomskih sila. Stil života je postao sedanteran, ali izrazito dinamičan po broju aktivnosti, zbog čega je nastala iluzija nedostatka vremena. Mijenjaju se osnovna obilježja pojedinih elemenata stila života koja utiču na tjelesnu težinu. Smanjuje se kretanje, skraćuje spavanje i mijenja struktura ishrane. Fizičko opterećenje modernog čovjeka na radnom mjestu je sve manje, a fizička aktivnost u slobodno vrijeme je minimalna. Zbog napretka tehnologije prehrambene industrije i distribucije hrane ljudi su izloženi sve većim izazovima uzimanja suvišne hrane. Javlja se nesrazmjer između energetske vrijednosti unesene hrane i potrošene energije. Konačan rezultat je blagi, ali konstantan višak unesene energije koji rezultuje porastom tjelesne težine. Gojaznost je teško liječiti jer je to bolest savremenog stila života. Stoga je važno postati svjestan neophodnosti brige o zdravlju i učiniti potrebne promjene vremenske organizacije dana i stila života. Tek nakon toga je moguće učiniti održive promjene strukture ishrane, koja će rezultirati trajnim smanjenjem unosa energije. Gubitak na težini od 15% ima značajnu korist kod osoba sa T2D i gojaznošću i može dovesti do remisije T2D. Gotovo svi lijekovi odobreni od strane Američke Agencije za hranu i lijekove za liječenje gojaznosti imaju povoljan efekat i na regulaciju glikemije kod oboljelih od T2D. U ove lijekove spadaju: orlistat, phentermine/topiramate, naltrexone/bupropion, liraglutid i semaglutid. Razvoj novog lijeka, sa dvostrukim efektom, koagonisti receptora za GIP i GLP 1, ima potencijal da postane nova terapijska opcija za liječenje gojaznosti uT2D.

Ključne riječi: gojaznost, tip 2 dijabetesa, liječenje

OBESITY AND TYPE 2 DIABETES - POSSIBILITIES OF PREVENTION AND TREATMENT

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Abstract: Obesity and type 2 diabetes (T2D) represent two related pandemics. More than 90% of T2D patients are overweight or obese. The obesity pandemic is favored by many factors, but it is considered that biological reasons (genetics, epigenetics of man) on the one hand, and lifestyle on the other, are of decisive importance for the emergence of obesity. Lifestyle changes that cause obesity are driven by powerful social, cultural, and economic forces. The lifestyle became sedentary, but extremely dynamic in terms of the number of activities, which created the illusion of a lack of time. The basic characteristics of certain lifestyle elements that affect body weight are changing. Movement decreases, sleep shortens and there are changes of diet. The physical load of people in modern times at the workplace is decreasing, and physical activity in their free time is minimal. Due to the advancement of food industry, technology and food distribution, people are exposed to increasing challenges of consuming excess food. There is a disproportion between the energy value of the food consumed and the energy spent. The final result is a slight but constant surplus of energy intake resulting in an increase in body weight. Obesity is difficult to treat because it is a disease of the modern lifestyle. Therefore, it is important to become aware of the necessity of health care and to make the necessary changes in the time organization of the day and lifestyle. Only after that it is possible to make sustainable changes in the structure of nutrition, which will result in a permanent reduction in energy intake. Weight loss of 15% has a significant benefit in people with T2D and obesity and can lead to remission of T2D. Almost all drugs approved by the US Food and Drug Administration for the treatment of obesity have a beneficial effect on the regulation of glycemia in patients with T2D. These drugs include: orlistat, phentermine/topiramate naltrexone/bupropion, liraglutide, and semaglutide. The development of a new drug, with a dual effect, coagonist of GIP and GLP 1 receptors, has the potential to become a new therapeutic option for the treatment of obesity in T2D.

Key words: obesity, type 2 diabetes, treatment

PL – 2

BIOAKTIVNE SUPSTANCE GROŽĐA I PITANJE UMJERENOG KONZUMIRANJA VINA

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Sažetak: Zadnjih decenija stručna javnost plasira, a široka javnost sa znatnom zainteresovanošću prihvata značaj bioaktivnih komponenti hrane u zdravoj ishrani. Među ovim komponentama daleko najčešće se pominju antioksidansi, sa indicijama o čitavom nizu njihovih pozitivnih, prvenstveno preventivnih, zdravstvenih uticaja. Stručnjaci za ishranu, ali i neki medicinski krugovi grožđe i njegovi proizvodi, uključujući i alkoholni proizvod vino, često ističu kao solidne izvore supstanci korisnih u zdravoj ishrani. Ovdje se najčešće pominju pozitivna svojstva niza supstanci grožđa i vina kao antioksidanasa, sa naglašeno čestim isticanjem vrijednosti resveratrola i još nekih flavonoidnih jedinjenja. Svojevremena snažna medijska promocija tzv. "francuskog paradoksa" dala je velikog doprinosa i promjenama prehrambenih navika barem dijela stanovništva, ali i industriji vina. Kao i drugi fenomeni, "francuski paradoks" je, pored pristalica i niza publikovanih afirmativnih istraživanja, isprovocirao i drugačije stavove i mišljenja, uključujući osporavaoce promocije alkoholnih pića kao prehrambenih proizvoda s pozitivnim uticajem na zdravlje konzumenata. Saopštenje, pored kratkog osvrta na najvažnije biokativne supstance grožđa i vina i neke modernije modifikacije tehnologije vina čiji je cilj dobijanje vina bogatijih ovim supstancama, nudi kratku raspravu "francuskog paradoksa" i paradigmi iz njega proisteklih. U kratkim crtama posebno se diskutuje pitanje tzv. zdravlja ugodnog umjerenog konzumiranja vina i drugih alkoholnih pića nasuprot objektivnih opasnosti koje redovno konzumiranje alkohola može predstavljati po zdravlje konzumenata, uključujući socijalne posljedice alkoholizma kao ovisnosti. Zaključci donose preporuke za pristup vinu kao dijelu prehrambenih obrazaca i gastro kulture, uključujući i stručno utemeljene karakterizacije umjerenog konzumiranja vina.

Ključne riječi: grožđe, vino, antioksidansi, umjereno konzumiranje vina

BIOACTIVE SUBSTANCES OF GRAPES AND MODERATE WINE CONSUMPTION

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Abstract: In recent decades, the professionals have promoted, and the general public has, with considerable interest, accepted the importance of bioactive food components in a healthy diet. Among these components, antioxidants are by far the most frequently mentioned, with indications of a whole series of their positive, primarily preventive, health effects. Nutrition experts, as well as some medical circles, often emphasize grapes and their products, including the alcoholic product wine, as solid sources of substances useful in a healthy diet. Here, the positive properties of several grape and wine substances as antioxidants are most often mentioned, with the value of resveratrol and some other flavonoid compounds being frequently emphasized. At one time, strong media promotion of the so-called of the "French paradox" made a great contribution to changes in the eating habits of at least part of the population, but also to the wine industry. Like other phenomena, the "French paradox" has, in addition to supporters and a series of affirmative research publications, provoked different attitudes and opinions, including opponents of the promotion of alcoholic beverages as food products with a positive impact on the health of consumers. The presentation, in addition to a brief overview of the most important bioactive substances of grapes and wine and some more modern modifications of wine technology aimed at obtaining wines richer in these substances, offers a short discussion of the "French paradox" and the paradigms derived from it. In brief, the issue of the so-called health-friendly moderate consumption of wine and other alcoholic beverages versus the objective dangers that regular alcohol consumption can pose to the health of consumers, including the social consequences of alcoholism as an addiction. The conclusions bring brief recommendations for approaching wine as part of dietary patterns and gastronomic culture, including expertly based characterizations of moderate wine consumption.

Key words: grapes, wine, antioxidants, moderate wine consumption

PL – 3

TERAPIJSKO PRAĆENJE ANTIBAKTERIJSKIH LEKOVA

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Sažetak: Globalna svest o problemu rezistencije bakterija na delovanje antibakterijskih lekova prisutna je decenijama unazad, a potraga za rešenjem tog problema je kontinuirana. Najsvežiji primer je koncept upravljanja antibioticima (eng. antimicrobial stewardship) koji je deo Globalnog akcionog plana o suzbijanju antimikrobne rezistencije Svetske zdravstvene organizacije, koji bi trebalo da bude i deo nacionalnog akcionog plana država članica SZO. Sa druge strane, neprekidno raste broj kritično obolelih pacijenata gde adekvatna upotreba (optimalan izbor, optimalna doza, optimalno trajanje primene) antibakterijskih lekova predstavlja razliku između života i smrti. Dodatno je ovaj problem istakla epidemija COVID-19, u kojoj su se za lečenje obolelih koristili antibiotici u velikoj meri. Za postizanje povoljnog kliničkog ishoda kod svakog pojedinačnog pacijenta, uz obraćanje pažnje na rizik od nastanka i širenja rezistencije u određenoj populaciji, često je neophodan personalizovan pristup, odnosno izbegavanje pristupa lečenju „jedna veličina odgovara svima“. U personalizovanom pristupu potrebno je u realnom vremenu pratiti farmakokinetske i farmakodinamske parametre (FK/FD) antibiotika i na osnovu rezultata korigovati lečenje pojedinačnog pacijenta. Drugim rečima, praćenje terapijskih koncentracija antibiotika i usklađivanje dalje primenjenih doza sa osobinama uzročnika infekcije, je pristup u lečenju koji može dati najbolji efekat. Pored očuvanja ljudskog života što je primarni cilj personalizovanog pristupa lečenju, ne treba smetnuti sa uma ni ekonomski efekat adekvatne primene antibiotika, koji se manifestuje kroz smanjenje direktnih i indirektnih troškova lečenja. S obzirom na činjenicu da je na tržištu dostupan sve manji broj novorazvijenih antibiotika, jedini izlaz u borbi protiv rezistencije jeste optimalizacija upotrebe trenutno raspoloživih lekova, što se upravo postiže personalizovanim pristupom zasnovanim na terapijskom praćenju antibakterijskih lekova.

Ključne riječi: antibakterijski lekovi, terapijsko praćenje, farmakokinetika, farmakodinamika, rezistencija bakterija

THERAPEUTIC DRUG MONITORING OF ANTIMICROBIALS

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Abstract: Global awareness of the problem of bacterial resistance towards antibacterial drugs has been present for decades, and the search for a solution to this problem is continuous. The most recent example is the concept of antimicrobial stewardship, which is part of the Global Action Plan on Combating Antimicrobial Resistance of the World Health Organization, which should also be part of the national action plans of WHO member states. On the other hand, the number of critically ill patients is continuously increasing, where adequate use (optimal choice, optimal dose, optimal duration of administration) of antibacterial drugs represents the difference between life and death. In addition, this problem was highlighted by the epidemic of COVID-19, in which antibiotics were widely used in treatment. To achieve a favorable clinical outcome in each individual patient, while paying attention to the risk of emergence and spread of resistance in a particular population, a personalized approach is often necessary, that is, avoiding a "one size fits all" treatment approach. In a personalized approach, it is necessary to monitor the pharmacokinetic and pharmacodynamic parameters (FK/FD) of antibiotics in real time and to adjust the treatment of an individual patient based on the results. In other words, monitoring the therapeutic concentrations of antibiotics and harmonizing further administered doses with the characteristics of the cause of the infection is the treatment approach that can generate best effect. In addition to the preservation of human life, which is the primary goal of a personalized approach to treatment, one should not lose sight of the economic effect of adequate antibiotic use, which manifests itself through the reduction of direct and indirect costs of treatment. Given the fact that the number of newly developed antibiotics available on the market is decreasing, the only way to effectively fight against bacterial resistance is to optimize the use of currently available drugs, which is achieved by a personalized approach based on therapeutic monitoring of antibacterial drugs.

Key words: antibacterial drugs, therapeutic monitoring, pharmacokinetics, pharmacodynamics, bacterial resistance

PREDAVANJA PO POZIVU (SEKCIJSKO PREDAVANJE)

LECTURES BY INVITATION (SECTION LECTURE)

S – 1

OČEKIVANJA MLADIH OD SESTRINSKE PROFESIJE

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Sažetak: Demografski podaci za zaposlene u sestrinstvu se mijenjaju. Danas različite generacije ulaze u sestrinsku profesiju, uključujući generaciju Z koja ima drugačija očekivanja u karijeri u odnosu na druge generacije koje su već uključene u radne procese; ova očekivanja takođe utiču na odluku da se bave sestrinstvom. Smanjuje se procenat mladih koji pronalaze posao nakon srednje škole. Istraživanje iz 2016. godine otkrilo je da mladi ljudi doživljavaju sestrinsku profesiju kao podređenu ljekaru, ograničenu autonomiju i oskudne mogućnosti za karijeru – što nije najbolja polazna tačka za razvoj sestrinske radne snage u Sloveniji. Cilj rada je da se identifikuju ključni faktori koji utiču na odluku o ulasku u sestrinsku profesiju i očekivanja studenata generacije Z prema sestrinstvu. Biće primjenjen neeksperimentalni kvantitativni dizajn istraživanja. Podaci će se prikupljati putem on-line ankete. Namjenski uzorak obuhvatiće studente prvog ciklusa studija Sestrinstva na Fakultetu zdravstvene njege Angela Boškin. Podaci će biti analizirani korišćenjem SPSS softvera, v. 21.0. Sprovešće se univarijantna i bivarijantna analiza. Statistička značajnost će biti postavljena na nivo $p \leq 0,05$. Rezultati će biti predstavljeni na Konferenciji pošto je istraživanje još u toku. Kao društvo, susrećemo se sa novim izazovima sa kojima se moramo suočiti kako bi nove generacije donijele promjene u sestrinstvu i u zdravstvenoj zaštiti. Neophodno je uspostaviti integrisane, prijateljske odnose među različitim generacijama – ovo predstavlja izazov za medicinske sestre koje rade u međugeneracijskim timovima. Medicinske sestre generacije Z očekuju efikasnu komunikaciju sa aktivnim slušanjem, žele sažete i tačne povratne informacije, očekuju konstruktivnu kritiku, žele da budu dio tima i žele da rade u okruženju podrške. Autonomija u donošenju odluka i mogućnost profesionalnog razvoja tokom karijere postaju ključni faktori za buduće medicinske sestre i za razvoj mladih medicinskih sestara.

Ključne riječi: mladi ljudi, profesija, medicinska sestra, očekivanja, odnosi

YOUNG PEOPLE'S EXPECTATIONS OF THE NURSING PROFESSION

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Abstract: Demographic data for nursing employees is changing. Today, different generations are entering the nursing profession, including Generation Z which has different career expectations compared to other generations already included in work processes; these expectations are also influencing the decision to go into nursing. The percentage of young people who find work after secondary school is decreasing. Research from 2016 revealed that young people perceive the nursing profession as being subordinate to physicians, having limited autonomy, and having scarce career opportunities—not the best starting point for the development of the nursing workforce in Slovenia. The aim of the article is to identify key factors influencing the decision to enter the nursing profession and expectations of Generation Z students towards nursing. A non-experimental quantitative research design will be employed. Data will be collected through an on-line survey. A purposive sample will include students of the first-cycle study program Nursing at the Angela Boškin Faculty of Health Care. Data will be analyzed using SPSS software, v. 21.0. Univariate and bivariate analyses will be conducted. Statistical significance will be set at the $p \leq 0.05$ level. Results will be presented at the conference as the research is still being conducted. As a society, we are facing new challenges which have to be met so that new generations can bring about change also in nursing and health care. It is essential to establish integrated, friendly relationships among different generations—this represents a challenge for nurses working in intergenerational teams. Generation Z nurses expect effective communication with active listening, desire concise and to-the-point feedback, expect constructive criticism, want to be part of a team, and want to work in a supportive environment. Autonomy in decision making and the possibility of career-long professional development are becoming key factors for future nurses and for the development of young nurses.

Key words: young people, profession, nurse, expectations, relations

S – 2

FIZIKALNA TERAPIJA PACIJENATA S UGRAĐENIM ENDOPROTEZAMA ZGLOBOVA

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Sažetak: Prema kliničkim uputstvima Američke akademije ortopedskih hirurga (AAOS) iz 2011., za liječenje simptomatskog osteoartritisa ramena, kuka i koljena, preporučuje se konzervativni modalitet liječenja. Isti podrazumjeva: smanjenje tjelesne težine, fizičku aktivnost, program fizikalne terapije i primjenu nesteroidnih antiinflamatornih ljekova. Kad je iscrpljeno konzervativno liječenje, pristupa se hirurškom liječenju. Indikacija za hirurško liječenje je kada postoji intezivan bol u zglobu, koja ograničava ili onemogućuje svakodnevne životne aktivnosti, traje u mirovanju i budi pacijenta tokom noći. Dosadašnja istraživanja pokazuju, da pacijenti kojima nije urađena preoperativna fizikalna terapija, imaju poslije ugrađene endoproteze za 10% - 30% veći stepen bola i slabiju funkciju zgloba, u odnosu na one koji su imali odrađenu fizikalnu terapiju. Velik broj autora preporučuje preoperativnu fizikalnu terapiju zgloba, koji će biti zamjenjen endoprotezom u trajanju: jedni od 3 dana, većina njih od 6-8 nedelja, a neki tri mjeseca prije operacije. Preoperativna fizikalna terapija treba da obuhvata: procjenu, tretman i edukaciju pacijenta, sa ciljem da se postigne optimizacija funkcije endoproteze zgloba. Fizikalna terapija zahtijeva multidisciplinarni pristup koji treba da obavljaju: ortoped, fizijatar i fizioterapeut. Danas bolesnici provode postoperativnu fizikalnu terapiju po standardnom protokolu. Ortopedski hirurg daje sugestije fizioterapeutu, a iste se odnose na: hirurški pristup, intraoperativne jatrogene lezije, tip endoproteze (parcijalna, totalna), korištenje koštanih transplantata, krvarenja. Postoperativna, akutna, fizikalna terapija započinje onog dana kada je bolesnik operisan uz nadzor i pomoć fizioterapeuta. Počinje se provoditi u bolničkom krevetu: disanjem, pravilnim abdominalnim disanjem, izometričkim, izotoničkim vježbama, bilo aktivnim, aktivno potpomognutim ili pasivnim. Rana rehabilitacija po ugradnji endoproteze ramena podrazumjeva, da u prve tri nedelje od operacije, pacijent nosi ortozu za rame, radi pendularno opuštanje ruke više puta tokom dana. Treba da vrši: aktivne vježbe šake i podlaktice uz dozirani otpor, izometričke vježbe prednjeg, srednjeg i stražnjeg m. deltoideusa, izometričke vježbe stabilizatora lopatice, pasivni pokret fleksije nadlaktice do granice bola. Rana rehabilitacija po ugradnji endoproteze kuka podrazumjeva: izometričke vježbe kvadricepsa, glutealnih mišića, mišića potkoljenice, abduktornog i aduktornog mišića kuka. Aktivno potpomognutim vježbama se povećava obim pokreta kuka, koljena, skočnog zgloba. Aktivne vježbe se obavljaju u cilju jačanja mišića trupa i gornjih ekstremita. Treba se obaviti vertikalizacija i hod s dvije podlaktične štake, pacijent se edukuje za hod po ravnom, te niz i uz stepenice. Po ugradnji endoproteze koljena, rehabilitacija se započinje sa vježbama statičke kontrakcije donjih ekstremiteta, vježbe kvadricepsa, vježbe fleksije koljena

po podlozi (ev. kinematička šina). Od početka paziti na fleksornu kontrakturu koljena (nekoliko puta dnevno držati nogu u potpunoj ekstenziji sa podloškom za petu). Preporučuje se sjedenje na krevetu s nogama preko ruba, obavlja se vertikalizacija i hod uz pomoć potpazušnih štaka, uz oslonac na operisanu nogu do tolerancije bola. Može se koristiti krioterapija, eventualno elektrostimulacija. Kod otpusta iz bolnice, bolesnik mora znati: samostalno ustajanje iz kreveta, ustajanje i sjedanje na stolicu, korištenje WC, hoda uz pomoć potpazušnih štaka na ravnom, uz i niz stepenice. Treba biti edukovan da svaki dan samostalno radi po tri puta naučene vježbe i povećava hodnu prugu.

Ključne riječi: endoproteza ramena, kuka i koljena, preoperativna i postoperativna fizikalna terapija

PHYSICAL THERAPY OF PATIENTS WITH IMPLEMENTED ENDOPROSTHESES OF JOINTS

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Abstract: According to the 2011 American Academy of Orthopedic Surgeons (AAOS) clinical guidelines, a conservative treatment modality is recommended for the treatment of symptomatic osteoarthritis of the shoulder, hip, and knee. It includes: reducing body weight, physical activity, a physical therapy program and the use of non-steroidal anti-inflammatory drugs. When conservative treatment is exhausted, surgical treatment is used. The indication for surgical treatment is when there is intense pain in the joint, which limits or prevents daily life activities, lasts at rest and wakes up the patient during the night. Previous research shows that patients who did not undergo preoperative physical therapy have a 10% - 30% higher degree of pain and lower joint function after the implanted endoprosthesis, compared to those who underwent physical therapy. A large number of authors recommend preoperative physical therapy of the joint, which will be replaced by an endoprosthesis for a duration: some of them for 3 days, most of them for 6-8 weeks, and some for three months before the surgery. Physical therapy should include: assessment, treatment and education of the patient, with the aim of achieving optimization of joint endoprosthesis function. Physical therapy requires a multidisciplinary approach that should be performed by: orthopedist, physiatrist and physiotherapist. Today, patients undergo postoperative physical therapy according to a standard protocol. The orthopedic surgeon gives suggestions to the physiotherapist, and they relate to: surgical approach, intraoperative iatrogenic lesions, type of endoprosthesis (partial, total), use of bone grafts, bleeding. Postoperative, acute, physical therapy begins on the day the patient is operated on with the supervision and assistance of a physiotherapist. It begins to be carried out in the hospital bed: breathing, correct abdominal breathing, isometric, isotonic exercises, either active, actively assisted or passive. Early rehabilitation after the installation of a shoulder endoprosthesis means that in the first three weeks after the operation, the patient wears a shoulder orthosis, performs pendular relaxation of the arm several times during the day. They should perform: active hand and forearm exercises with dosed resistance, isometric exercises of the front, middle and back muscles of deltoideus, isometric exercises of the scapula stabilizer, passive flexion movement of the upper arm to the limit of pain. Early rehabilitation after installing a hip endoprosthesis includes: isometric exercises of the quadriceps, gluteal muscles, calf muscles, hip abductor and adductor muscles. Actively assisted exercises increase the range of motion of the hip, knee, and ankle joint. Active exercises are performed in order to strengthen the muscles of the trunk and upper extremities.

Verticalization and walking with two forearm crutches should be performed, the patient is educated to walk on the level, and down and up stairs. After installing the knee endoprosthesis, rehabilitation begins with static contraction exercises of the lower extremities, quadriceps exercises, and knee flexion exercises on the floor (e.g. kinematic rail). From the beginning, pay attention to the flexor contracture of the knee (hold the leg in full extension with a heel pad several times a day). It is recommended to sit on the bed with your legs over the edge, verticalization and walking with the help of underarm crutches, with support on the operated leg until pain tolerance. Cryotherapy can be used, possibly electrostimulation. Upon discharge from the hospital, the patient must know how to: independently get out of bed, get up and sit on a chair, use the toilet, walk with the help of underarm crutches on a level surface, up and down stairs. They should be educated to independently do the learned exercises three times a day and increase their gait.

Key words: shoulder, hip and knee endoprosthesis, preoperative and postoperative physical therapy

S – 3

TIMSKI RAD U REHABILITACIJI

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Sažetak: Moderni koncept rehabilitacije zasniva se na sveobuhvatnom sagledavanju oštećenja i ograničenja pacijenta, koje mogu ozbiljno ograničavati funkciju i kvalitet života. Rehabilitacija je proces koji pomaže osobi sa fizičkim ili mentalnim problemom, povratak u socijalnu sredinu. Za postizanje ovog cilja neophodno je uključivanje profesionalaca različitih medicinskih i nemedicinskih oblasti u rehabilitacioni tim. Timski rad uključuje definisanje glavnih ciljeva i izradu plana, čijoj realizaciji doprinosi svaki član u skladu sa svojom ekspertizom. Razvoj timova u oblasti zdravstva nije nikada lak, niti jednostavan posao. Neophodno je edukovati osoblje o prednostima timskog pristupa tretmanu pacijenata, što je posebno važno u neurološkoj rehabilitaciji. Formiranje specijalizovanih jedinica u okviru velikih bolničkih sistema, npr. "jedinica za inzult" olakšava timski rad. Efikasnost rehabilitacionih timova, često je uzdrmana ličnim konfliktima, nejasnim ulogama, izvršavanjem više uloga u sklopu radnog vremena, statusnim problemima ili nedostatkom kliničkog modela za timske aktivnosti. Često se previđa činjenica da postoje "timovi unutar timova" i da članovi tima pripadaju i određenim odjelima. Uloga i značaj članova tima se mijenja u skladu sa poboljšanjem stanja pacijenta. *Noon* opisuje interdisciplinarni tim kao grupu osoba treniranih u različitim oblastima znanja sa različitim konceptima, metodama, podacima i terminima, organizovanu na zajedničkom naporu na rješavanju zajedničkog problema, uz kontinuiranu međusobnu komunukaciju članova iz različitih disciplina. Evidentna je povećana podrška za razvoj multidisciplinarnih timova, posebno u neurološkoj i ortopedskoj rehabilitaciji. Brojni autori ističu da specifične i kompleksne potrebe pacijenata sa neurološkim oštećenjima i onesposobljenjem, ne mogu biti zadovoljene od strane jedne medicinske discipline i zaključuju da je timski rad neophodan u rehabilitaciji.

Ključne riječi: multidisciplinarni tim, rehabilitacija, neurorehabilitacija

TEAM WORK IN REHABILITATION

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Abstract: The modern concept of rehabilitation is based on a comprehensive view of the various disabilities and limitations which can impose serious constraints upon function and quality of life. Rehabilitation is a proces which helps an individual with physical or mental desorder return to society. To achieve this aim, it is necessary to include a number of different professions in the rehabilitation team. Team work involves the definition of common goals and the development of a plan to which each member makes a different but complementary contribution. The development of teams in health care system has never been easy or simple task. It is important to educate qualifed staff in the advantages of a team approach, especialy in neurological rehabilitation. Development of specialized units, like "stroke unit" makes it easier for team work within large hospital systems. The efficasy of rehabilitation teams often flounder on the rocks of personality conflict, role ambiguity, status problems, or the lack of a clinical mode for team activities. It is often overlooked that there are „teams within teams"and that team members also belong to departments. The prominence of different team members changes as recovery progresses. Noon describes an interdisciplinary team as a group consisting of "persons trained in different fields of knowledge with different concepts, methods, data and terms, organized for a common effort on a common problem with continuous intercommunication among the participants from the different disciplines". There is growing support for the development of multidisciplinary teams, especially in neurorehabilitation and orthopedic rehabilitation. Many authors claim that the subtle and diverse needs of patients with neurological disability are unlikely to be met by one discipline, with the conclusion that "a team approach is vital in rehabilitation".

Key words: multidisciplinary team, rehabilitation, neurorehabilitation

S – 4

ULOGA RADNOG TERAPEUTA U PROCESU INKLUZIJE

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Sažetak: Inkluzija je proces koji ruši predrasude, dozvoljava restruktuiranje i poduzimanje neophodnih koraka da svi budu uključeni u sve segmente društvenog života bez obzira na različitosti. Fokus je najčešće na obrazovnom modelu, koji se zajedno sa socijalnim i medicinskim modelom, dovodi u vezu sa radnom terapijom. Objašnjenje inkluzije ima teorijske osnove upravo u terminima koji su srodni radnoj terapiji kao što su: univerzalni dizajn, aktivnosti svakodnevnog života, invalidnost, onesposobljenost, rehabilitacija, funkcionalnost, barijere, učešće itd. Istovremeno, struka radnih terapeuta u našim okolnostima nije dovoljno uključena u inkluzivni proces i u ovom radu će se pokazati djelimičnim pregledom značajnih dokumenata i zakonskih regulativa koji proteklih dvadeset godina afirmišu inkluziju u Republici Srpskoj i Bosni i Hercegovini. Cilj ovog članka je da ukaže na značaj radnih terapeuta u procesu primjene kvalitetne inkluzije bilo da se radi o obrazovnom, socijalnom ili medicinskom modelu. Koristeći širok spektar kompetencija radnih terapeuta neophodno je afirmisati njihovu buduću ulogu u radu sa djecom i odraslim osobama sa posebnim potrebama. U završnom dijelu, biće navedene konkretne preporuke koje mogu doprinijeti prevazilaženju evidentnih propusta u trenutnoj praksi pri našim okolnostima.

Ključne riječi: radni terapeut, inkluzija, proces, posebne potrebe

ROLE OF AN OCCUPATIONAL THERAPIST IN THE PROCESS OF INCLUSION

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Abstract: Inclusion is the process that destroys prejudice, allows reconstruction and taking the necessary steps for including everyone in all aspects of social life regardless of their differences. The focus is most often on the educational model, which we will together with social and medical model associate with occupational therapy. The explanation of inclusion has theoretical foundations precisely in terms related to occupational therapy such as: universal design, daily life activities, disability, disablement, rehabilitation, functionality, barriers, participation, etc. At the same time, profession of occupational therapists in our circumstances is not sufficiently involved in the process of inclusion. We will point to that in this paper with partial review of significant documents and legal regulations that affirm inclusion in Republika Srpska and Bosnia and Herzegovina over the past twenty years. The aim of this article is to point out the importance of occupational therapists in the process of applying quality inclusion, whether it is an educational, social or medical model. Using a wide range of competencies of occupational therapists, it is necessary to affirm their future role in working with children and adults with special needs. Finally, we will provide concrete recommendations to address the current oversights in practice under our circumstances.

Key words: occupational therapist, inclusion, process, special needs

S - 5

MOGUĆNOST UPOTREBE VEŠTAČKE INTELIGENCIJE U OKUPACIONOJ TERAPIJI

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Sažetak: Ovaj rad se bavi istraživanjem mogućnosti primene veštačke inteligencije u okupacionoj terapiji. Primena veštačke inteligencije u okupacionoj terapiji može značajno poboljšati efikasnost rehabilitacije, ubrzati proces oporavka i smanjiti troškove lečenja. U radu su predstavljeni primeri i mogućnosti primene veštačke inteligencije u okupacionoj terapiji, kao što su robotski eksoskeletoni koji pomažu pacijentima da povrate funkcije pokreta, kao i aplikacije koje mogu da procene sposobnost pacijenta za obavljanje različitih zadataka. Takođe se razmatraju izazovi koji se javljaju pri primeni veštačke inteligencije u okupacionoj terapiji, kao što su pitanja privatnosti i bezbednosti pacijenata. Na kraju se zaključuje da primena veštačke inteligencije ima veliki potencijal za unapređenje okupacione terapije i da će buduća istraživanja u ovoj oblasti biti od velikog značaja za pacijente i zdravstvene radnike.

K**ljučne riječi**: okupaciona terapija, specijalna edukacija i rehabilitacija, veštačka inteligencija, informatičke tehnologije

THE POSSIBILITY OF USING ARTIFICIAL INTELLIGENCE IN OCCUPATION THERAPY

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Abstract: This paper explores the possibilities of using artificial intelligence (AI) in occupational therapy. Occupational therapy focuses on rehabilitating patients, helping them to regain their functions and return to everyday life. The application of AI in occupational therapy can significantly improve the efficiency of rehabilitation, speed up the recovery process, and reduce treatment costs. The paper presents examples of AI application in occupational therapy, such as robotic exoskeletons that help patients regain movement functions, as well as applications that can assess the patient's ability to perform different tasks. The challenges that arise when applying AI in occupational therapy, such as privacy and patient safety issues, are also discussed. Finally, it is concluded that the use of AI has great potential for improving occupational therapy and that future research in this field will be of great importance to patients and healthcare professionals.

Key words: occupational therapy, artificial intelligence, special education and rehabilitation, ICT

S – 6

TROMBOFILIJA U PEDIJATRIJSKOM UZRASTU

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Sažetak: Trombozi i faktorima za nastanak tromboze u djece pridaje se sve veća pažnja, a od hematologa se često traži da procijene djecu sa simptomatskom trombozom. Vrlo često u praksi je potrebno procijeniti i djecu bez simptoma koja imaju rođake oboljele od tromboze ili trombofilije. Mnogo se raspravlja o kliničkoj korisnosti testiranja na trombofiliju i traže se odgovori koga, kada, kako i zašto testirati na trombofiliju u dječijoj dobi. Najčešći testovi koji se upotrebljavaju u testiranju trombofilnih stanja su: Factor V Leiden mutacija, mutacija na Prothrombin 20210, deficit Antitrombina III kao i testovi koji utvrđuju deficit proteina C i S, te utvrđivanje postojanja hiperhomocistinemije. Djeca s trombozom su heterogena grupa i malo je vjerojatno da je samo jedan pristup testiranju ili liječenju optimalan ili poželjan. Uzročna uloga nasljednih protrombotičkih defekata u mnogim pedijatrijskim trombotičkim događajima nije potpuno jasna. Pedijatrijski pacijenti koji će najvjerojatnije imati koristi od testiranja na trombofiliju uključuju adolescente sa spontanom trombozom i tinejdžere s poznatom pozitivnom porodičnom anamnezom koje odlučuju o primjeni kontracepcije koja može imati protrombotični efekat. Neki nasljedni trombofilni defekti povezani su sa većim rizikom od ponovne venske tromboembolije u djece. Odluku o provođenju testiranja na trombofiliju u asimptomatskih bolesnika sa pozitivnom porodičnom anamnezom treba donijeti na individualnoj osnovi nakon razgovora sa pacijentom. Područje pedijatrijske tromboze se intenzivno razvija, otkriva se sve veći broj okolnosti u djetinjstvu koje su praćene sa povećanim rizikom od tromboze te je potrebno prospektivno longitudinalno praćenje djece sa trombofilijom kako bi se odredio ishod i odgovor na liječenje kao i potreba sa profilaksom.

Ključne riječi: Tromobofilija, tromboza, dijete

THROMBOPHILIA IN PEDIATRIC AGE

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Abstract: Thrombosis and factors leading to thrombosis in children are receiving increasing attention, and hematologists are often asked to evaluate children with symptomatic thrombosis. Very often in practice it is necessary to assess children without symptoms who have relatives suffering from thrombosis or thrombophilia. There is a lot of discussion about the clinical utility of testing for thrombophilia and answers are sought as to who, when, how and why to test for thrombophilia in children. The most common tests used in the testing of thrombophilic conditions are: Factor V Leiden mutation, Prothrombin 20210 mutation, Antithrombin III deficiency, as well as tests that determine protein C and S deficiency, and confirming the existence of hyperhomocystinemia. Children with thrombosis are a heterogeneous group, and it is unlikely that a single approach to testing or treatment is optimal or desirable. The causal role of inherited prothrombotic defects in many pediatric thrombotic events is not completely clear. Pediatric patients most likely to benefit from thrombophilia testing include adolescents with spontaneous thrombosis and teenagers with a known positive family history who decide to use contraception that may have a prothrombotic effect. Some inherited thrombophilic defects are associated with a higher risk of recurrent venous thromboembolism in children. The decision to perform thrombophilia testing in asymptomatic patients with a positive family history should be made on an individual basis after a discussion with the patient. The field of pediatric thrombosis is developing intensively, an increasing number of circumstances in childhood are being discovered that are accompanied by an increased risk of thrombosis, and prospective longitudinal monitoring of children with thrombophilia is needed to determine the outcome and response to treatment as well as the need for prophylaxis.

Key words: thrombophilia, thrombosis, children

S-7

VALORIZACIJA OTPADA OD HRANE U SVRHU SMANJENJA UTICAJA NA ŽIVOTNU SREDINU I ZDRAVLJE LJUDI

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Sažetak: Dio hrane se gubi duž lanca snabdijevanja, odnosno hrana se rasipa. Nadležne institucije procjenjuju da se više od jedne trećine od ukupne količine proizvedenih poljoprivredno-prehrambenih proizvoda u svijetu ne iskoristi u ishrani ljudi, već se oni rasipaju ili završavaju kao otpad. Uzimajući u obzir sve veći broj neuhranjenih ljudi u svijetu i iscrpljivanje prirodnih resursa, sistemi upravljanja otpadom od hrane uvršteni su među ciljeve usvojene u Agendi 2030. Prema usvojenim planovima, gubici hrane treba da se smanje za 50% do 2030. godine. Cilj ovog rada jeste da se pažnja svih zainteresovanih strana usmjeri na potrebu smanjenja gubitaka hrane i mogućnosti korištenja otpada od hrane kao sirovine za proizvodnju energije i finih hemikalija, te da se ukaže na mjere za ublažavanje nepovoljnih ekoloških i socijalno-ekonomskih posljedica uzrokovanih rješavanjem pitanja otpada hrane. Tokom pisanja ovog preglednog rada autori su analizirali veliki broj naučnih publikacija u međunarodnim i domaćim časopisima i izvještaje relevantnih domaćih i međunarodnih institucija. U radu je dato više prijedloga za upravljanje otpadom i rješenja kroz izradu novih proizvoda koji imaju dodatnu vrijednost. U zaključku rada navodi se da valorizacija otpada, uključujući sporedne proizvode iz lanca snabdijevanja hranom, predstavlja koncept održivog razvoja kojeg se svi učesnici u lancu snabdijevanja hranom trebaju pridržavati. Sporedni proizvodi nastali u prehrambenom sektoru mogu se iskoristiti kao sirovina za izradu novih prehrambenih proizvoda za ishranu ljudi i u proizvodnji stočne hrane. Ovi proizvodi su biomasa pogodna za izradu biodizela, biogasa i drugih energenata, te velikog broja finih hemikalija koje imaju primjenu u prehrambenoj, farmaceutskoj, kozmetičarskoj, hemijskoj i drugim granama industrije.

Ključne riječi: gubici hrane, otpad od hrane, ekološki i zdravstveni uticaji, valorizacija otpada

RECOVERY OF FOOD WASTE FOR THE PURPOSE OF REDUCING THE IMPACT ON THE ENVIRONMENT AND HUMAN HEALTH

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Abstract: Part of the food is lost along the supply chain, respectively food is wasted. Competent institutions estimate that more than one-third of the total amount of produced agricultural and food products in the world is not used in human nutrition, but is wasted or ends up as waste. Taking into account the growing number of malnourished people in the world and the depletion of natural resources, food waste management systems are included among the goals adopted in Agenda 2030. According to the adopted plans, food losses should be reduced by 50% until 2030. The aim of this work is to focus the attention of all interested parties on the need to reduce food losses and the possibility of using food waste as a raw material for the production of energy and fine chemicals, and to point out measures to mitigate the adverse environmental and social-economic consequences caused by solving the waste of food issue. During the writing of this review, the authors analyzed a large number of scientific publications in international and domestic journals and reports of relevant domestic and international institutions. The paper presents several proposals for waste management and solutions through the creation of new products that have added value. In the conclusion of the paper, it is stated that the valorization of waste, including by-products from the food supply chain, represents a concept of sustainable development that all participants in the food supply chain should adhere to. By-products created in the food sector can be used as raw materials for the production of new food products for human consumption and in the production of animal feed. These products are biomass suitable for the production of biodiesel, biogas and other energy sources, as well as a large number of fine chemicals that are used in the food, pharmaceutical, cosmetic, chemical and other branches of industry.

Key words: food losses, food waste, environmental and health impacts, valorization of waste

S - 8

UTICAJ ČIŠĆENJA I DEZINFEKCIJE U PROIZVODNIM POGONIMA NA MIKROBIOLOŠKI KVALITET HRANE

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Sažetak: Dobra higijenska praksa smanjuje mogućnost kontaminacije hrane patogenim mikroorganizmima i mikroorganizmima koji kvare hranu. Tokom proizvodnog procesa dolazi do onečišćenja površina različitim zagađivačima koji mogu biti fizičke, hemijske i mikrobiološke prirode. Mikroorganizmi predstavljaju poseban problem jer se u pogodnim uslovima razmnožavaju i stvaraju metabolite kojima ugrožavaju zdravstvenu bezbjednost hrane i/ili narušavaju kvalitet hrane.
Poseban problem u prehrambenoj industriji je formiranje biofilma, koji predstavlja zajednicu mikroorganizama koji rastu i razvijaju se ugrađeni u samoproizveden matriks ekstrapolimernih supstanci. U slučaju proizvodnih procesa za koje je svojstveno ili moguće stvaranje biofilma, temeljno čišćenje i dezinfekcija površina su prventiva stvaranju biofilma. Efektivnost primjene procedura dobre higijenske prakse odražava se na mikrobiološki kvalitet površina koje dolaze u kontakt sa hranom i mikrobiološki kvalitet hrane. Mikrobiološki kvalitet površina koje dolaze u kontakt sa hranom obično se procjenjuje preko ukupnog broja mikroorganizma i/ili detekcije prisustva patogenih ili uslovno patogenih mikroorganizama. Za hranu se primjenjuju dvije vrste mikrobioloških kriterijuma hrane, uključujući kriterijume za patogene mikroorganizme i indikatorske organizme. Kriterijum bezbjednosti hrane određuje prihvatljivost proizvoda ili serije (lota) i odnosi se na hranu stavljenu na tržište sve do isteka njenog roka upotrebe. Kriterijumi higijene procesa proizvodnje određuju prihvatljivost procesa i primenjuju se tokom proizvodnog procesa. Pojedinačni mikroorganizmi, grupe mikroorganizama ili njihovi toksini koji se ispituju, plan uzorkovanja i mikrobiološki kriterijumi definisani su u okviru nacionalih i internacionalnih propisa. Kada nisu zadovoljeni kriterijumi bezbjednosti, hrana je izvor po zdravlje opasnih mikroorganizama i mora biti povučena sa tržišta. U slučaju kada nisu zadovoljeni kriterijumi higijene proizvodnje, potrebno je pokretanje korektivne mere i praćenje njene efektivnosti. Iako postoje različiti putevi i izvori kontaminacije hrane, provođenje sanitarnih procedura u objektima za proizvodnju, rukovanje i distribuciju hrane, neophodan je doprinos zdravstvenoj bezbjednosti hrane i očuvanju kvaliteta hrane.

Ključne rječi: čišćenje, dezinfekcija, hrana, mikrobiološki kvalitet

INFLUENCE OF CLEANING AND DISINFECTION IN PRODUCTION FACILITIES ON THE MICROBIOLOGICAL QUALITY OF FOOD

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Good hygiene practices reduce the possibility of food contamination by pathogenic and spoilage microorganisms. During the production process, surfaces are contaminated with various types of physical, chemical, and microbiological pollutants. Microorganisms are a special problem because they grow under suitable conditions and produce metabolites that have an impact on the health safety of food and /or impair the quality of food. A huge challenge in the food industry is the formation of a biofilm, which represents a community of microorganisms that grow and develop embedded in a self-produced matrix of extrapolymeric substances. In the case of production processes for which the formation of biofilms is characteristic or possible, thorough cleaning and disinfection of surfaces are preventive to the formation of biofilms. The effectiveness of applying good hygiene practice procedures is reflected in the microbiological quality of surfaces that come into contact with food and the microbiological quality of food. The microbiological quality of surfaces that come into contact with food is usually assessed through the total number of microorganisms and/or the detection of the presence of pathogenic or conditionally pathogenic microorganisms. Two types of microbiological food criteria apply to food, including criteria for pathogenic microorganisms and indicator organisms. The food safety criteria determine the acceptability of a product or batch (lot) of product and apply to food placed on the market during its shelf-life. Process hygiene criteria determine the acceptability of the process and are applied during the production process.Individual microorganisms, groups of microorganisms or their toxins to be tested, sampling plan, and microbiological criteria are defined within national and international regulations. When the food safety criteria are not met, the food is a source of health-threatening microorganisms and must be withdrawn from the market. In the event of unsatisfactory results as regards process hygiene criteria, it is necessary to initiate corrective action and monitor its effectiveness. Although there are different ways and sources of food contamination, the implementation of sanitary procedures in food production, handling, and distribution facilities, is a necessary contribution to food health safety and to food quality assurance.

Keywords: cleaning, disinfection, food, microbiological quality

ZDRAVSTVENA NJEGA

HEALTH CARE

ZNJ - 1

NEKI POKAZATELJI ZDRAVSTVENOG STANJA STANOVNIŠTVA REPUBLIKE SRPSKE

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Sažetak: Zdravstvena zaštita i zdravlje stanovništva ne zavise isključivo od zdravstvenog sistema nego i od različitih demografskih pokazatelja. Uspješnost sprovođenja zdravstvene zaštite u velikoj mjeri zavisi od strukture zdravstvenih ustanova i zdravstvenih radnika. U zdravstvenom sistemu 2021. godine bilo je stalno zaposleno 9.941 radnik. Od toga su 71,37% zdravstveni radnici. Najviše je zdravstvenih radnika sa srednjom stručnom spremom (59,79%), dok ljekari čine 29,30% zaposlenih. Vodeći uzrok smrti u Republici Srpskoj su bolesti cirkulatornog sistema od kojih je u 2021. godini umrlo 7217 osoba (639,6/100.000). Od posljedica infekcije virusom Covid-19 umrlo je 3846 osoba (340,9/100.000), od neoplazmi je umrlo 2623 osobe (232,5/100.000). Slijede simptomi, znakovi i nedovoljno definisana stanja sa 2213 umrlih (196,1/100.000), endokrine bolesti i poremećaji metabolizma 921 (81,6/100.000), bolesti respiratornog sistema 640 (56,7/100.000). Epidemiološka situacija u Republici Srpskoj u pogledu zaraznih bolesti može se ocijeniti nezadovoljavajućom. Najveći procenat (94,49%) dobio je vakcinu protiv tuberkuloze, zatim vakcinu protiv hepatitisa B (89,91%), protiv zauški i malih boginja (80,38%), dok je vakcinu protiv difterije, tetanusa, velikog kašlja i dječije paralize dobilo svega 72,46% djece.

Ključne riječi: zdravstvena zaštita, morbiditet, mortalitet, vakcinacija

SOME INDICATORS OF THE HEALTH STATUS OF THE POPULATION OF THE REPUBLIC OF SRPSKA

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Abstract: Healthcare and the health of the population depend not only on the healthcare system, but also on various demographic indicators.The success of the implementation of health care largely depends on the structure of health institutions and health workers.In 2021, 9.941 workers were permanently employed in the healthcare system, 71.37% of them being health workers.The majority of health workers have a secondary education (59.79%), while doctors make up 29.30% of employees.The leading cause of death in the Republic of Srpska are diseases of the circulatory system, from which 7.217 people died in 2021 (639.6/100,000). 3.846 people (340.9/100,000) died from the consequences caused by Covid-19 virus, 2.623 people (232.5/100,000) died of neoplasms. Following are the symptoms, signs and insufficiently defined conditions with 2213 deaths (196, 1/100,000), endocrine diseases and metabolic disorders 921 (81.6/100,000), respiratory system diseases 640 (56.7/100,000). The epidemiological situation in the Republic of Srpska, in terms of infectious diseases, can be evaluated as unsatisfactory.The highest percentage of children (94.49%) received a vaccine against tuberculosis, followed by a vaccine against hepatitis B (89.91%), vaccine against mumps and measles (80.38%), while only 72.46% received the vaccine against diphtheria, tetanus, whooping cough and polio.

Key words: health care, morbidity, mortality, vaccination

ZNJ- 2

DISC KOMUNIKACIJSKI MODEL- PRIMJENA U SESTRINSKOJ PRAKSI

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Sažetak: Pružajući usluge zdravstvene zaštite, medicinske sestre-tehničari u zdravstvenom sistemu, ostvaruju niz kontakata sa pacijentima, članovima njihovih porodica i drugim zdravstvenim profesionalcima. Ti kontakti su često površni, kratkotrajni i usmjereni na zadovoljavanje administrativnih potreba. Za profesionalce u zdravstvu oni su stvar rutine, često se obavljaju na podsvjesnom nivou. Svjetska istraživanja ukazuju na činjenicu da je više od 80% registrovanih neželjenih događaja u zdravstvu povezano sa problemima u komunikaciji. To jasno ukazuje na činjenicu da su komunikacione vještine zdravstvenih radnika na niskom nivou. Uzrok tome je neprilagođenost komunikacionih vještina i zdravstvenih trendova. Cilj rada je da se ukaže na činjenicu da je paternistički model komunikacije u kojem se pacijent tretira kao objekat u zdravstvenom sistemu, a medisinska sestra kao pomoćni radnik prevaziđen. Danas uspješna komunikacija sa pacijentom podrazumijeva primjenu adaptivnih modela komunikacije, modela prilagođenih individualnim potrebama pacijenta i njegovom tipu ličnosti/ponašanja, a komunikacija među zaposlenima, trebala bi se odvijati kroz međusobno uvažavanje i saradnju. U ovom radu obrađen je jedan od modela adaptivne komunikacije poznat kao DISC model. Model je baziran na Eskulapovom učenju, razvijan kroz istoriju drevnih civilizacija i konačno oblikovan od strane William Moulton Marston-a, 1928. godine. Riječ je o praktičnom komunikacijskom "alatu" pomoću kojeg možemo lako prepoznati sklonosti u ponašanju i komuniciranju ljudi s kojima dolazimo u interakciju, razumijemo njihove osnovne potrebe kako bismo mogli brzo pronaći zajednički jezik s njima i stvoriti rapport, te bili u mogućnosti "upakovati" im svoju poruku tako da je jasno prime i pridaju joj upravo ono značenje koje smo joj izvorno pridali. Uz to, DISC komunikacijski model pomože nam da steknemo jasniji uvid u vlastite sklonosti u ponašanju i komuniciranju, naše snage, potencijalne zone konflikta u odnosu na različite tipove ljudi i razloge zašto nas ljudi percipiraju na način kako nas percipiraju.

Ključne riječi: DISC model, komunikacija, adaptivni

DISC COMMUNICATION MODEL- APPLICATION IN NURSING PRACTICE

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Abstract: By providing health care services, nurse-technicians in the health system have a series of contacts with patients, their family members and other health professionals. These contacts are often superficial, short-term and aimed at satisfying administrative needs. For healthcare professionals, they are a matter of routine, often performed on a subconscious level. Worldwide research points to the fact that more than 80% of registered adverse events in healthcare are related to communication problems. This clearly indicates the fact that the communication skills of healthcare workers are at a low level. The reason for this is the lack of adaptation of communication skills and health trends. The aim of the paper is to point out the fact that the paternalistic model of communication in which the patient is treated as an object in the health system, and the nurse as an auxiliary worker, has been overcome. Today, successful communication with the patient implies the application of adaptive communication models, models adapted to the individual needs of the patient and their type of personality/behavior, and communication between employees should take place through mutual respect and cooperation. In this paper, one of the adaptive communication models known as the DISC model is discussed. The model is based on the teachings of Aesculapius, developed throughout the history of ancient civilizations and finally shaped by William Moulton Marston in 1928. It is a practical communication "tool" with which we can easily recognize the behavior and communication tendencies of the people we interact with, understand their basic needs so that we can quickly find a common language with them and create a rapport, and be able to "package" them their message so that they clearly receive it and give it exactly the meaning we originally gave it. In addition, the DISC communication model helps us gain a clearer insight into our own tendencies in behavior and communication, our strengths, potential conflict zones in relation to different types of people and the reasons why people perceive us the way they perceive us.

Key words: DISC model, model, adaptive

ZNJ - 3

SOCIOLOŠKI ASPEKTI SMANJENE FIZIČKE AKTIVNOSTI KOD OSOBA STARIJE ŽIVOTNE DOBI

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Sažetak: Istraživanja u cijelom svijetu, posebno u visokorazvijenim zemljama, ukazuju na smanjenu fizičku aktivnost novih generacija. S jedne strane, raste broj oboljelih od hroničnih degenerativnih bolesti (kardiovaskularnog, endokrino-metaboličkog i lokomotornog sistema), dok sa druge strane imamo duži prosječni životni vijek čovjeka. Rezultat djelovanja ova dva faktora neminovno dovodi do smanjenja kvaliteta života. Stav Svjetske zdravstvene organizacije govori da je snižen nivo funkcionalnih sposobnosti nezavisan, ali za većinu ljudi reverzibilan, faktor nepotrebnog obolijevanja i preranog umiranja i to u istom rangu sa značajem drugih faktora hroničnih nezaraznih oboljenja kao što su: hipertenzija, dijabetes, visok nivo masnoće u krvi, pušenje i dr. Posljedice smanjene fizičke aktivnosti, osim što smanjuju kvalitet života, utiču i na znatno veću potrošnju finansijskih sredstava. Prema podacima Republičkog zavoda za statistiku Republike Srpske ukupna potrošnja u zdravstvu RS neprestano raste, tako da je u 2015. godini potrošnja na godišnjem nivou iznosila oko 1.039.533.000 KM, a u 2020. oko 1.475.184.000 KM. Takođe, u porastu je i potrošnja za zdravstvo po stanovniku RS, a iznosila je oko 866 KM u 2015. do 1.055 KM u 2020. godini. Prema podacima Instituta za javno zdravstvo RS najviše oboljelih u 2021. godini na teritoriji RS bilo je od neoplazmi, zaraznih i parazitarnih oboljenja, bolesti nervnog sistema i organa čula, bolesti cirkulatornog sistema. Tokom 2021. godine najviše umrlih je od bolesti cirkulatornog sistema, posljedica infekcije virusom Covid 19, neoplazmi, nedovoljno definisanih stanja, endokrinih bolesti i poremećaja metabolizma.

Ključne riječi: zdravstvena zaštita, kvalitet života, hronična nezarazna oboljenja

SOCIOLOGICAL ASPECTS OF REDUCED PHYSICAL ACTIVITY IN ELDERLY PERSONS

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Abstract: Research all over the world, especially in highly developed countries, points to reduced physical activity of the new generations. On the one hand, the number of people suffering from chronic degenerative diseases (cardiovascular, endocrine-metabolic and locomotor system) is increasing, while on the other hand, we have a longer average human lifespan. The result of the interaction of these two factors inevitably leads to the reduction of quality of life. The position of the World Health Organization is that the reduced level of functional abilities is an independent, but for most people reversible, factor of unnecessary illness and premature death, and that it is on the same level as the importance of other factors of chronic non-communicable diseases such as: hypertension, diabetes, high level of fat in the blood, smoking, etc. The consequences of reduced physical activity, in addition to reducing the quality of life, also affect significantly higher consumption of financial resources. According to the data of the Republic Institute for Statistics, the total consumption in the healthcare system of the Republic of Srpska is constantly growing, so in year 2015 the consumption on the annual level was about 1,039,533,000 BAM, and in 2020 about 1,475,184,000 BAM. Also, per capita costs spent on healthcare in the Republic of Srpska are on the rise, from 866 BAM in 2015 to 1,055 BAM in 2020. According to the data of the Institute of Public Health, in 2021, the majority of patients on the territory of the Republic of Srpska suffered from neoplasms, infectious and parasitic diseases, diseases of the nervous system and sense organs, and diseases of the circulatory system. During the year 2021, the most deaths were caused by diseases of the circulatory system, consequences caused by the infection with the Covid 19 virus, by neoplasms, insufficiently defined conditions, endocrine diseases and metabolic disorders.

Key words: health care, quality of life, chronic non-communicable diseases

ZNJ - 4

EVALUACIJA INSTRUMENATA ZA IDENTIFIKACIJU KOGNITIVNIH OŠTEĆENJA KOD STARIH OSOBA

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Sažetak: Demencija kod starih osoba je nedovoljno prepoznato stanje. Detaljna procjena kognitivnog statusa može omogućiti ranu identifikaciju visokorizičnih bolesnika koji su kandidati za demenciju. Kognitivna oštećenja imaju prevalenciju od 5,1–37,5%. Iako je kognitivna procjena kamen temeljac gerijatrijske njege, još uvijek ne postoji sveobuhvatan i lak za interpretaciju instrument, obećavajući potencijal za preporučeni sistem dijagnostikovanja demencije. Cilj ovog sistematskog pregleda literature je bio da se istraže radovi u kojima su korišteni instrumenti za kognitivni skrining i demenciju kod starih osoba u primarnoj i sekundarnoj zdravstvenoj zaštiti. Studije su preuzete preko elektronske baze PubMed, od januara 2013. do januara 2023. Elektronske baze su pretraživane definisanjem ključnih riječi (Cognitive impairment and Cognitive assessment and Cognitive screening tools and older people), korištenjem Boolean operatora AND i OR. Naslovi i apstrakti su pregledani, a ako je apstrakt ispunjavao kriterijume uključivanja, tekst je preuzet u cjelini. Pregledom PubMed baze podataka i strategijom istraživanja identifikovane su 56 studija. Nakon pregledanih radova u cjelini i prema jasno definisanim kriterijumima uključivanja studija, u završnu detaljnu analizu uključeno je šest radova. Identifikovana su 52 instrumenta za kognitivnu procjenu. Najčešće u upotrebi su bili Mini-mental test MMSE, Montreal Cognitive Assessment MoCA, Mini-Cog test. Dokazi upotrebe brojnih validiranih instrumenata za procjenu kognitivnog statusa, imaju veliki potencijal u identifikaciji rizika od demencije. Buduće studije zahtijevaju razvoj i implementaciju novog instrumenta dovoljne pouzdanosti sa svim indikatorima kognitivnog statusa zbog identifikacije demencije na vrijeme, kao i adekvatnog liječenja osoba sa demencijom uz prateća dodatna oboljenja.

Ključne riječi: starost, instrumenti, kognitivna procjena, demencija, stare osobe

EVALUATION OF INSTRUMENTS FOR THE IDENTIFICATION OF COGNITIVE IMPAIRMENTS IN ELDERLY PEOPLE

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Abstract: Dementia in the elderly is an under-recognized condition. Detailed assessment of cognitive status may enable early identification of high-risk patients who are candidates for dementia. Cognitive impairments have a prevalence of 5.1–37.5%. Although cognitive assessment is a cornerstone of geriatric care, there is still no comprehensive and easy-to-interpret instrument, promising potential for a recommended dementia diagnostic system. The aim of this systematic literature review was to investigate papers that used instruments for cognitive screening and dementia in the elderly in primary and secondary health care. The studies were downloaded through the electronic database PubMed, from January 2013 to January 2023. Electronic databases were searched by defining key words (Cognitive impairment and Cognitive assessment and Cognitive screening tools and older people), using the Boolean operators AND and OR. Titles and abstracts were screened, and if the abstract met the inclusion criteria, the text was retrieved in its entirety. A review of the PubMed database and a research strategy identified 56 studies. After reviewing the papers as a whole and according to the clearly defined study inclusion criteria, six papers were included in the final detailed analysis. 52 instruments for cognitive assessment were identified. Mini-mental test MMSE, Montreal Cognitive Assessment MoCA, Mini-Cog test were most frequently used. Evidence from the use of numerous validated instruments to assess cognitive status has great potential in identifying the risk of dementia. Future studies require the development and implementation of a new instrument of sufficient reliability with all indicators of cognitive status due to timely identification of dementia, as well as adequate treatment of persons with dementia with accompanying additional diseases.

Key words: age, instruments, cognitive assessment, dementia, elderly people

ZNJ - 5

ZDRAVSTVENA NJEGA BOLESNIKA SA TEŠKIM NAPADOM BRONHIJALNE ASTME

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Sažetak: Astma je upalna bolest velikih i malih disajnih puteva. Tipično se javlja u mlađoj životnoj dobi kod osoba sklonih atopiji. Zbog svojih zdravstvenih poteškoća pacijenti sa bronhijalnom astmom su osjetljva grupa pacijenata, a shodno sa tim pristup medicinske sestre mora biti dobro isplaniran. Kvalitetna komunikacija preduslov je mogućnosti sprovođenja sigurne i efikasne zdravstvene njege. Cilj ovog istraživanja je prikaz pacijenta i uloga medicinske sestre u zdravstvenoj njezi pacijenta oboljelog od bronhijalne astme po procesu zdravstvene njege, utvrđivanje potreba pacijenta za njegom, kao i prikaz sadržaja sestrinskih intervencija kod posmatranog pacijenta. Ovaj rad je rađen po tipu prikaza pacijenta. U istraživanju je korišćena istorija bolesti pacijenta, sestrinska anamneza uzeta od pacijenta. Podaci su prikupljeni metodom posmatranja, mjerenjima i analizom dostupne medicinske dokumentacije. Istraživanje je sprovedeno u Domu zdravlja Foča, u periodu od 01.01. – 05.02.2023. godine. Poslije obrade podataka medicinska sestra je utvrdila sljedeće sestrinske dijagnoze: smanjena prohodnost disajnih puteva, poremećen ritam sna, bol, anksioznost, gubitak apetita, umor, deficit znanja o bolesti i higijensko-dijetetskom režimu, nedovoljna informisanost o terapijskim i dijagnostičkim procedurama, mogućnost nastanka povišene tjelesne temperature, mogućnost razvoja infekcije usne duplje zbog iskašljavanja, visok rizik za nastanak infekcije zbog braunile, visok rizik za gubitak tečnosti, mogućnost socijalne izolacije. Nakon završetka hospitalizacije fizičko i psihičko stanje pacijenta se značajno poboljšalo, evaluacija sestrinskog procesa je bila pozitivna.

Ključne riječi: bronhijalna astma, pacijent, proces zdravstvene njege, medicinske sestre, sestrinske dijagnoze

HEALTH CARE OF PATIENTS WITH A SEVERE ATTACK OF BRONCHIAL ASTHMA

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Abstract: Asthma is an inflammatory disease of the large and small airways. It typically occurs at a younger age in people prone to atopy. Because of their health problems, patients with bronchial asthma are a sensitive group of patients, and accordingly, the nurse's approach must be well planned. Quality communication is a prerequisite for the possibility of implementing safe and effective health care. The goal of this research is to describe the patient and the role of the nurse in the health care of a patient suffering from bronchial asthma according to the health care process, to determine the patient's needs for care, as well as to describe the content of nursing interventions in the observed patient. This work was done according to the type of patient presentation. The patient's medical history, nursing history taken from the patient were used in the research. The data were collected by the method of observation, measurements and analysis of available medical documentation. The research was conducted in the Health Center in Foča, in the period from 01.01.–05.02.2023. After processing the data, the nurse determined the following nursing diagnoses: reduced airway patency, disturbed sleep rhythm, pain, anxiety, loss of appetite, fatigue, lack of knowledge about the disease and the hygienic-dietary regimen, insufficient information about therapeutic and diagnostic procedures, the possibility of increased body temperature, the possibility of developing an infection of the oral cavity due to coughing, a high risk of developing an infection due to brownilla, a high risk of fluid loss, the possibility of social isolation. After the end of the hospitalization, the physical and mental condition of the patient improved significantly, the evaluation of the nursing process was positive.

Key words: bronchial asthma, patient, health care process, nurses, nursing diagnoses

ZNJ - 6

UTICAJ EDUKACIJE NA KVALITET ŽIVOTA OSOBA KOJE ŽIVE SA DIJABETESOM TIP 2

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Sažetak: Dijabetes TIP 2 važan je zdravstveni problem na području Grada Prijedora. Iako se pruža adekvatan medicinski tretman na svim nivoima zdravstvene zaštite, to nije dovoljno da bi pacijenti bili edukovani o svojoj bolesti. Rana dijagnoza, promjene životnih stilova i efektivan tretman su ključni u izbjegavanju hroničnih komplikacija i gubitka kvaliteta života. Broj oboljelih od dijabetesa TIP 2 je u stalnom porastu, te se ukazala potreba da se dodatne edukacije sprovode u Udruženju dijabetičara u Prijedoru. Kroz edukacije spriječiti pojavu akutnih i hroničnih komplikacija, podići svijest o odgovornosti za vlastito zdravlje i samokontrolu bolesti. Edukacije se sprovode kroz male grupe (njih 10) koje su napravljene prema načinu liječenja, životnoj dobi, stepenu obrazovanja i prethodnom znanju o bolesti. U maloj grupi svi pacijenti osjećaju pripadnost skupini koja ima iste ili slične probleme. Takav osjećaj smanjuje psihičku napetost, koja doprinosi lakšoj kontroli bolesti. Mala grupa je pogodna za edukaciju u Udruženju kroz radionice o osnovnim informacijama o šećernoj bolesti, njenom liječenju, ishrani, akutnim i hroničnim komplikacijama, fizičkoj aktivnosti, vještinama aplikacije inzulina, rukovanje glukometrom i pravilnim odlaganjem medicinskog otpada. Kroz udruženje je prošlo 100 pacijenata kroz deset radionica. Kontrolni pregled kod dijabetologa nakon radionica je obavilo njih 70, kod kojih je uočeno značajno poboljšanje kontrole bolesti. Kvalitet života pacijenata sa diajbetesom TIP 2 koji su prisustvovali edukativnim radionicama znatno je poboljšan u odnosu na pacijente koji nisu prošli kroz edukacije u Udruženju dijabetičara.

Ključne riječi: dijabetes TIP 2, kvalitet života, edukacija, samokontrola, udruženje dijabetičara

IMPACT OF EDUCATION ON THE QUALITY OF LIFE OF PERSONS LIVING WITH TYPE 2 DIABETES

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Abstract: Type 2 diabetes is an important health problem in the area of the City of Prijedor. Although adequate medical treatment is provided at all levels of health care, it is not enough for patients to be educated about their illness. Early diagnosis, lifestyle changes and effective treatment are key in avoiding chronic complications and loss of quality of life. The number of people suffering from type 2 diabetes is constantly increasing, so there is a need to conduct additional education at the Association of Diabetics in Prijedor. Through education, prevent the occurrence of acute and chronic complications, raise awareness of responsibility for one's own health and self-control of diseases.Education is conducted through small groups (10 of them) which are made according to the method of treatment, age, level of education and previous knowledge about the disease. In a small group, all patients feel that they belong to a group that has the same or similar problems. Such a feeling reduces psychological tension, which contributes to easier control of the disease. A small group is suitable for education in the Association through workshops on basic information about diabetes, its treatment, nutrition, acute and chronic complications, physical activity, insulin application skills, glucometer handling and proper disposal of medical waste. 100 patients went through ten workshops through the association. After the workshops, 70 of them had a follow-up examination by a diabetologist, in which a significant improvement in disease control was observed. The quality of life of patients with type 2 diabetes who attended educational workshops was significantly improved compared to patients who did not go through education at the Association of Diabetics.

Keywords: type 2 diabetes, quality of life, education, self-control, association of diabetics

ZNJ - 7

DIJABETSKO STOPALO KAO MANIFESTACIJA VIŠESTRUKIH KOMPLIKACIJA ŠEĆERNE BOLESTI

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Sažetak: Dijabetsko stopalo je složena komplikacija šećerne bolesti, nastaje kao rezultat višestrukih metaboličkih poremećaja i posljedične dijabetske angiopatije i neuropatije, manifestuje se mekotkivnim i koštanim ishemijskim i upalnim promjenama koje bolesnika dovode u visok rizik, da doživi neku od amputacija na nivou donjeg ekstremiteta. Cilj je ukazati na složenost patološko anatomskih promjena i najčešće kliničke manifestacije sinergijskog djelovanja vaskularnih i neuroloških komplikacija šećerne bolesti. Retrospektivnom analizom je obrađeno 87 hospitalno liječenih pacijenata sa manifestacijom dijabetskog stopala u periodu od jedne godine. Izvršena je analiza kliničkih manifestacija dijabetskog stopala u odnosu na pol i životnu dob bolesnika te prikazani ishodi primijenjenog liječenja. Najveći broj liječenih je bio u starosnoj dobi od 50 do 59 godina (29,89%) i nešto manje u sljedeće dvije dekade životnog doba. U grupi od 87 liječenih bolesnika, više od dvije trećine su bili muškarci, njih 60 (68,97%). Kod polovine liječenih (49,43%) su utvrđene promjene u smislu globalne ishemije i gangrene stopala dok je gangrena prstiju bila kod skoro jedne trećine liječenih (28,74%). Nekomplikovanu ulceraciju je imalo svega 6,9% bolesnika dok su upalne promjene tipa flegmone ili apscesa uzrokovane infekcijom utvrđene kod 14,9% liječenih. Pozitivan ishod liječenja i potpuno sačuvano stopalo je postignuto kod samo 16 bolesnika (21,62%) dok je kod ostalih primjenjena amputaciona hirurgija. Amputacija pojedinih prstiju je izvršena kod 33 bolesnika (44,59%), dezartikulacija na nivou Lisfrankovog zgloba kod 9 (12,60%) dok je potkoljena amputacija urađena kod 14 (18,94) i natkoljena kod 2 bolesnika (2,70%). Dijabetsko stopalo je manifestacija sinergijskog djelovanja složenih metaboličkih poremećaja i njihovih reperkusija na periferni vaskularni i nervni sistem. Kod najvećeg broja liječenih (78,16%) su kod prijema na bolničko lječenje utvđene gangrenozne promjene pojedinih segmenata stopala. Kod 57,19% operativno liječenih pacijenata je primijenjena amputacija na nivou stopala, a kod 18,94% je urađena potkoljena amputacija.

Ključne riječi: dijabetsko stopalo, infekcija, gangrena, amputacija

DIABETIC FOOT AS A MANIFESTATION OF MULTIPLE DIABETES COMPLICATIONS

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Abstract: Diabetic foot is a complex diabetes complication and it occurs as a result of multiple metabolic disorders and consequential diabetic angiopathy and neuropathy; it is followed by ischemic and inflamatory changes on soft tissues and bones that can put a patient at risk of undergoing amputation at a lower extremity level. The goal is to emphasize the complexity of pathoanatomical changes and most common clinical manifestations of synergic effects of vascular and neurological diabetes complications. Retrospective analysis included 87 hospitally treated patients with diabetic foot manifestations in a period of one year. The analysis of clinical manifestations was carried out in relation to the gender and age of patients and the outcomes of applied treatment were presented. Most of patients were in the age group 50-59 years (29.89%) and a smaller number of them were in the next two decades of age. Out of 87 patients, more than two thirds of them were males – 60 or 68.7%. One half of the patients (49.43%) felt changes in a sense of global ischemia and foot gangrene, while almost one third of patients (28.74%) had gangrene in toes. Only 6.9% of patients had an uncomplicated ulceration, while inflamatory changes such as phlegmon or abscess caused by infection were present in 14.9% patients. Only 16 (21.62%) patients had a positive outcome of medical treatment and their feet healed completely, while the others underwent an amputation. Amputation of individual toes was performed in 33 cases (44.59%), disarticulation at the level of Lisfranc joint was performed in 9 feet (12.60%), while the below-knee amputation was performed in 14 (18.94%) cases. 2 patients (2.70%) underwent an above-knee amputation. Diabetic foot is a manifestation of synergic effect of complex metabolical disorders and their repercussions on peripheral vascular and nervous system. Upon admission to hospital, most of the patients (78.16%) had gangrenous changes of individual foot segments. 57.19% of surgically treated patients underwent a foot amputation and 18.94% of them underwent below-knee amputation.

Key words: diabetic foot, infection, gangrene, amputation

ZNJ-8

ANKSIOZNI I DEPRESIVNI POREMEĆAJI DJECE I ADOLESCENATA

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Sažetak: Normalan razvoj kod djece i adolescenata uključuje i psihološke probleme i problematična ponašanja. Shodno tome, anksiozni i depresivni simptomi mogu biti dio normalnog razvoja svakog djeteta i ukoliko isčeznu s dobi i nemaju za posljedicu disfunkcionalno ponašanje djeteta, ne smijemo ih posmatrati kao dokaz „psihopatologije“. Cilj rada je bio utvrditi učestalost anksioznih i depresivnih poremećaja kod djece i adolescenata, utvrditi razlike u pojavi simptomatologije anksioznih i depresivnih poremećaja kod djece i adolescenata u odnosu na spol, utvrditi da li postoji značajna razlika pojave poremećaja kod djece u osnovnoj i srednjoj školi, utvrditi da li postojanje loših socio-ekonomskih uslova življenja (posebni, specifični, nezaposlenost roditelja, razvod, konfliktne situacije) utiče na pojavu anksiozne i depresivne simptomatologije. Utvrditi dobnu i spolnu distribuciju, utvrditi mjesto stanovanja ispitanika (urbana ili ruralna sredina). Istraživanje je provedeno u JU „Dom zdravlja“ Zenica, Centru za psihofizičke i govorne poteškoće djece i adolescenata od 6 do 18 godina. Istraživanje je provedeno u periodu Mart – Juni 2020. godine, a obuhvaćeno je 500 ispitanika oba spola. Istraživanje je retrospektivno, deskriptivno, epidemiološko. Zaštita podataka u svrhu istraživanja poštuje zakonska, etička načela i propise. Istraživanje je obuhvatilo 500 ispitanika, od toga 263 (53%) muškog i 237 (47%) ženskog spola. Veći broj dječaka i djevojčica sa prijavljenim mjestom stanovanje je na ruralnim područjima, muških (23%), ženskih (27%). Od ukupnog broja ispitanika, 62% živi u zajednici sa oba roditelja. Od ukupno 500 liječenih ispitanika kod 137 je dijagnostikovan anksiozno depresivni poremećaj. Nije utvrđena statistički značajna razlika u odnosu anksiozno depresivnih poremećaja kod djece i adolescenata.

Ključne riječi: razvoj, djeca, adolescenti, anksiozno depresivni poremećaj, centar za psihofizičke i govorne poteškoće

ANXIETY AND DEPRESSIVE DISORDERS IN CHILDREN AND ADOLESCENTS

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Abstract: Normal development in children and adolescents includes both psychological problems and problematic behavior. Consequently, anxiety and depressive symptoms can be part of the normal development of any child and and if they disappear with age and do not result in dysfunctional behavior of the child, we should not have them be seen as evidence of "psychopathology". The aim of the work was to determine the frequency of anxiety and depressive disorders in children and adolescents, to determine the differences in the symptomatology of anxiety and depressive disorders in children and adolescents in relation to gender, to determine whether there is a significant difference in the occurrence of disorders in children in primary and secondary school, to determine whether the existence of poor socio-economic living conditions (special, specific, parental unemployment, divorce, conflict situations) affects the occurrence of anxiety and depressive symptomatology. Determine the age and gender distribution, determine the place of residence of the respondents (urban or rural). The research was conducted at the "Dom zdravlja" Zenica Center for Psychophysical and Speech Difficulties of Children and Adolescents from 6 to 18 years of age. The research was conducted in the period March - June 2020, and included 500 respondents of both sexes. The research is retrospective, descriptive, epidemiological. Data protection for the purpose of research respects legal, ethical principles and regulations. The research included 500 respondents, of which 263 (53%) were male and 237 (47%) were female. A greater number of boys and girls with a registered place of residence are in rural areas, male (23%), female (27%). Of the total number of respondents, 62% live in a community with both parents. Out of a total of 500 treated subjects, 137 were diagnosed with anxiety-depressive disorder. No statistically significant difference was found in the ratio of anxiety-depressive disorders in children and adolescents.

Key words: development, children, adolescents, anxiety-depressive disorder, center for psychophysical and speech difficulties

ZNJ - 9

IZAZOVI I BUDUĆNOST SESTRINSTVA

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Sažetak: Sestrinstvo danas predstavlja profesiju koja se konstantno razvija i prodire u nove segmente zdravstvenog sistema u kojima pronalazi svoju primjenu. Medicinske sestre i tehničari teže daljem obrazovanju, nastojeći steći veće kompetencije i znanja kako bi se sestrinstvo dodatno razvijalo i dostizalo nove nivoe primjene. Upravo ta dinamika razvijanja sestrinstva i primjena ove grane u raznim segmentima zdravstvenog sistema dovodi do suočavanja sa novim izazovima, uz čije prevazilaženje ova profesija postaje još snažnija. Definisanjem sestrinstva kao samostalne profesije pred savremenu medicinsku sestru je postavljen čitav niz profesionalnih, obrazovnih i društvenih izazova, a posebno u onim zemljama u kojima sestrinska profesija još uvijek ima neadekvatanu društvenu sliku. Obrazovni sistem današnjice osposobljava medicinske sestre za razvoj znanja i vještina koja se primjenjuju u profesionalnom radu. Cilj ovog rada je prikazati dinamičnost i izazove sa kojima se ova profesija suočava, te predvidjeti budućnost razvoja sestrinstva. Ovaj rad predstavlja opažajno-deskriptivno-analitičku studiju u kojoj je kao materijal istraživanja korišten kritčki pregled naučne literature i dostupne informacije o mougćnosti edukacije medicinskih sestara/tehničara na nivou I ciklusa studija. Sestrinstvo se kroz historiju razvijalo usmenim predajama, zapisima, bilješkama, dokumentacijom, koja je dovela do pisanih uputa, priručnika, knjiga za obrazovanje, školovanje osoba za profesiju sestrinstva. Ako trend razvoja sestrinstva bude išao ovim tempom, budućnost ove profesije će se ogledati u velikim uspjesima, ali i izazovima. Znanje koje se stekne u medicinskim školama i na fakultetima nije doživotno, već zahtjeva učenje koje se proteže čitavim radnim vijekom zbog činjenice da se medicinska nauka svakodnevno razvija.

Ključne riječi: sestrinstvo, obrazovanje, razvoj, izazovi

CHALLENGES AND THE FUTURE OF NURSING

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Abstract: Today, nursing represents a profession that is constantly developing and penetrating into new segments of the health system where it finds its application. Nurses and technicians strive for further education, striving to acquire greater competence and knowledge in order for nursing to further develop and reach new levels of application. It is precisely this dynamic of developing nursing and the application of this branch in various segments of the health system that leads to facing new challenges, overcoming which this profession becomes even stronger. By defining nursing as an independent profession, a whole series of professional, educational and social challenges is placed before the modern nurse, especially in those countries where the nursing profession still has an inadequate social image. Today's educational system trains nurses for the development of knowledge and skills that are applied in professional work. The aim of this paper is to show the dynamism and challenges that this profession faces, and to predict the future development of nursing. This paper represents an observational, descriptive, analytical study in which a critical review of the scientific literature and available information on the possibility of educating nurses/technicians at level I of the study cycle were used as research material. Throughout history, nursing developed through oral traditions, records, notes, documentation, which led to written instructions, manuals, books for education, training people for the profession of nursing. If the trend of nursing development continues at this pace, the future of this profession will be reflected in great successes, but also challenges. The knowledge acquired in medical schools and colleges is not lifelong, but requires learning that extends over the entire working life due to the fact that medical science develops daily.

Key words: nursing, education, development, challenges

ZNJ-10

ANALIZA POVREDA UZROKOVANIH SAOBRAĆAJNIM TRAUMATIZMOM U POPULACIJI DJECE I ADOLESCENATA LIJEČENIH U SLUŽBAMA HITNE MEDICINSKE POMOĆI

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Sažetak: Povrede nastale u saobraćaju i dalje predstavljaju globalnu epidemiju i hitan javni zdravstveni prioritet zbog međunarodnog obima morbiditeta i mortaliteta. Osnovni cilj ovog istraživanja bio je analizirati način nastanka povrede u odnosu na dob i pol, te identifikovati tip povrede i regiju tijela zahvaćenu povredom zadobijenom u saobraćaju kod pacijenata ≤19 godina liječenih u službama hitne medicinske pomoći Republike Srpske. Pacijenti su podijeljeni u dvije starosne grupe na djecu (0-9 godina) i adolescente (10-19 godina). Sprovedena je retrospektivna studija presjeka pri čemu su analizirani podaci iz nacionalne e-baze WebMedic iz 12 Službi hitne medicinske pomoći u periodu između januara 2018. i decembra 2020. godine. U pretragu su uključeni pacijenti, dobi ≤19 godina sa postavljenom dijagnozom nenamjerne povrede koja je nastala kao posljedica saobraćajne nezgode. Tokom posmatranog perioda identifikovano je 499 slučajeva, pri čemu je 91,2% upućeno na hospitalizaciju. Prosječna starosna dob bila je 13,9 godina (SD=5,48). Adolescenti dobi od 10 do 19 godina (78,4%) češće su bili izloženi povredama ($p<0,001$), sa predominacijom muškog pola ($p=0.006$). Prema svojstvu učesnika u saobraćajnim nezgodama više od polovine djece i adolescenti bili su putnici (51,9%), zatim pješaci (13,8%) i motociklisti (12,4%). Prema tipu povrede najčešće su identifikovane površinske povrede (49,1%) i višestruke povrede (18,4%). Najčešće zahvaćena regija tijela na kojoj je povreda nastala bila je glava (42,5%). Adolescenti dobi od 10 do 19 godine i muški pol češće su bili izloženi povredama uzrokovanim saobraćajnim nezgodama. Ovi rezultati bi mogli ukazati na neophodnost kreiranja programa sa ciljanom prevencijom kako bi se zaštitila ova visokorizična grupa.

Ključne riječi: djeca, adolescenti, povrede, saobraćajne nezgode, hitna medicinska pomoć

ANALYSIS OF INJURIES CAUSED BY TRAFFIC TRAUMA IN THE POPULATION OF CHILDREN AND ADOLESCENTS TREATED IN EMERGENCY MEDICAL SERVICES

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Abstract: Road traffic injuries continue to represent a global epidemic and an urgent public health priority due to the international scope of morbidity and mortality. The main goal of this research was to analyze the way the injury occurred in relation to age and sex, and to identify the type of injury and the region of the body affected by the injury sustained in traffic in patientes ≤19 years of age treated in the emergency medical services of the Republic of Srpska. Patients were divided into two age groups: children (0-9 years) and adolescents (10-19 years). A cross-sectional retrospective study was conducted, in which data from the national e-database WebMedic from 12 Emergency Medical Services were analyzed in the period between January 2018 and December 2020. The search included patients, aged ≤19 years with a diagnosis of an unintentional injury that occurred as a result of the road traffic injuries. During the observed period, 499 cases were identified, of which 91.2% were referred to hospitalization. The average age was 13.9 years (SD=5.48). Adolescents aged 10 to 19 (78.4%) were more often exposed to injuries ($p<0.001$), with male predominance ($p=0.006$). According to the nature of participants in traffic accidents, more than half of children and adolescents were passengers (51.9%), followed by pedestrians (13.8%) and motorcyclists (12.4%). According to the type of injury, superficial injuries (49.1%) and multiple injuries (18.4%) were most often identified. The most frequently affected region of the body where the injury occurred was the head (42.5%). Adolescents aged 10 to 19 and males were more often exposed to injuries caused by traffic accidents. These results could indicate the necessity of creating programs with targeted prevention in order to protect this high-risk group.

Key words: children, adolescents, injuries, traffic accidents, emergency medical assistance

ZNJ - 11

TRETMAN HRONIČNOG LUMBOSARKALNOG SINDROMA

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Sažetak: Lumbosakralni sindrom je skup oboljenja i poremećaja koji izazivaju bol u lumbalnom ili lumbosakralnom predjelu i može da se širi duž jedne, rjeđe duž obje noge. Pod ovim pojmom su obuhvaćeni lumbago, išijas, lumbalna išijalgija, lumbalna diskopatija, spondiloza. Terapija u hroničnoj fazi podrazumijeva primjenu NSAIL, antidepresiva, termoterapiju, elektroterapiju i kineziterapiju. Cilj rada je prikazati razlike među polovima kod lumbosakralnog sindroma pacijenata registrovanih u timu 3 porodične medicine u JZU Dom zdravlja Prijedor u periodu od 2011. do 2018. godine. U periodu od 7 godina, u timu 3 porodične medicine registrovano je 30 pacijenata sa lumbosakralnim sindromom. Prosječna starost pacijenata je iznosila 61,87 godina. Sindrom je bio podjednako zastupljen kod oba pola, 50% pacijenata je muškog i 50% pacijenata je ženskog pola. U posmatranom uzorku najčešća dijagnoza je bila M 51 – druge bolesti intervertebralnog diska (26,67%), koja je podjednako zastupljena kod oba pola. Na drugom mjestu, po učestlosti, nalaze se dijagnoze M 51.0 – bolesti lumbalnog i drugog intervertebralnog diska sa mijelopatijom i M 54 – dorzalgija (20%), koje su bile učestalije kod ženskog pola (66,67%) nego kod muškog pola (33,33%). Edukacijom stanovništva o važnosti fizičke aktivnosti i ulozi fizičke aktivnosti u prevenciji lumbosakralnog sindroma, kao i adekvatnim pristupom u akutnoj fazi, značajno se može uticati na pojavu hroničnog lubmosakralnog sindroma.

Ključne riječi: lumbosakralni sindrom, bol, tretman, prevencija

TREATMENT OF CHRONIC LUMBOSACRAL SYNDROME

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Abstract: Lumbosacral syndrome is a group of diseases and disorders that cause pain in the lumbar or lumbosacral region and can spread along one, less often along both legs. This term includes lumbago, sciatica, lumbar sciatica, lumbar discopathy, spondylosis. Therapy in the chronic phase includes the use of NSAIDs, antidepressants, thermotherapy, electrotherapy and kinesitherapy. The aim of the paper is to show the differences between the sexes in patients with lumbosacral syndrome registered in team 3 of family medicine at the Prijedor Health Center in the period from 2011 to 2018. In a period of 7 years, 30 patients with lumbosacral syndrome were registered in team 3 of family medicine. The average age of the patients was 61.87 years. The syndrome was equally represented in both sexes, 50% of patients were male and 50% of patients were female. In the observed sample, the most common diagnosis was M 51 - other diseases of the intervertebral disc (26.67%), which is equally represented in both sexes. In second place, in terms of frequency, are the diagnoses M 51.0 - diseases of the lumbar and second intervertebral disc with myelopathy and M 54 - dorsalgia (20%), which were more frequent in females (66.67%) than in males (33.33%). Educating the population about the importance of physical activity and the role of physical activity in the prevention of lumbosacral syndrome, as well as an adequate approach in the acute phase, can significantly influence the occurrence of chronic lumbosacral syndrome.

Keywords: lumbosacral syndrome, pain, treatment, prevention

ZNJ - 12

ANTIMIKROBNI, CITOTOKSIČNI I EFEKAT NA ZARASTANJE RANA ČETIRI BIS-BIBENZILA IZOLOVANA IZ JETRENJAČA

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Sažetak: Bis-bibenzili su prirodni makrociklični molekuli prisutni uglavnom kod jetrenjača (Marchantiophyta). Četiri bis-bibenzila (dva ciklična (maršancin A i maršancin E) i dva aciklična (perotetin F i perotetin E)) su ispitivana na antimikrobnu, anti-*Candida* i aktivnost na zarastanje rana. Za antimikrobnu aktivnost korišćeni su sledeći bakterijski sojevi: *Staphylococcus aureus* (ATCC 11632), *Listeria monocytogenes* (NCTC 7973), *Salmonella* Typhimurium (ATCC 13311). Za anti-Candida testove korišćeni su sojevi *Candida albicans* ATCC 10231, *Candida tropicalis* ATCC 750 i *Candida parapsilosis* ATCC 22019. Citotoksičnost jedinjenja je testirana na spontano imortalizovanoj ćelijskoj liniji humanih keratinocita kože (HaCaT korišćenjem kristalno ljubičaste boje). Rezultati su izraženi kao IC_{50} vrednost, što ukazuje na 50% inhibicije rasta HaCaT ćelija u poređenju sa netretiranom kontrolom. Za test zarastanja rana, HaCaT ćelije su uzgajane dok nisu dostigle konfluentnost. Testirani bis-bibenzili su pokazali značajnu antibakterijsku (MIC 0.3-1.2 mg/mL) i umerenu anti-*Candida* aktivnost (MIC 0.6-2.4 mg/mL). Jedinjenja, maršancin A i perotetin E, pokazala su najjaču antibakterijsku aktivnost sa MIC od 0.3 mg/mL na sva 3 ispitivana bakterijska soja. Najjači anti-*Candida* potencijal je pokazao maršancin E (MIC 0.6-1.2 mg/mL). Sa druge strane, jedinjenje perotetin F je pokazalo najniži antibakterijski potencijal (MIC 0.6-1.2 mg/mL) zajedno sa nižom anti-*Candida* aktivnošću (MIC 1.2-2.4 mg/mL). Jedinjenja nisu pokazala citotoksičnost na HaCaT ćelije pri maksimalnoj korišćenoj koncentraciji od 400 μg/mL što ih čini mogućim za bezbednu upotrebu. Budući da je minimalna inhibitorna koncentracija testiranih jedinjenja (u slučaju bakterija) bila niža od maksimalnih netoksičnih koncentracija prema ljudskim ćelijama, može se pretpostaviti da su ovi rezultati relevantni za buduća istraživanja i formulisanje efikasnih i bezbednih antimikrobnih agenasa.

Ključne reči: bis-bibenzili, antimikrobna aktivnost, anti-*Candida*, aktivnost na zarastanje rana

ANTIMICROBIAL, CYTOTOXIC AND WOUND HEALING EFFECTS OF FOUR BIS-BIBENZYLS ISOLATED FROM LIVERWORTS

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Abstract: Bis-bibenzyls are natural, macrocyclic molecules found mainly in liverworts (Marchantiophyta). Four bis-bibenzyls (two cyclic (marchantin A, marchantin E), and two acyclic (perrotettin F and perrotettin E)) were investigated for their antimicrobial, anti-*Candida*, and wound healing activity. The strains used for microdilution test were: *Staphylococcus aureus* (ATCC 11632), *Listeria monocytogenes* (NCTC 7973), *Salmonella* Typhimurium (ATCC 13311). For the anticandidal *Candida albicans* ATCC 10231, *Candida tropicalis* ATCC 750 and *Candida parapsilosis* ATCC 22019 were used. The cytotoxicity of the compounds was tested on spontaneously immortalised human keratinocyte cell line (HaCaT) using crystal violet with some modifications. The results were expressed as IC_{50} value, indicating 50% inhibition of growth of HaCaT cells when compared with untreated control. For Scratch-wound healing assay HaCaT cells were grown until they reached confluence. The bis-bybenzyls tested showed promising antibacterial (MIC 0.3-1.2 mg/mL) and moderate anti-*Candida* actvity (MIC 0.6-2.4 mg/mL). The compounds, marchantin A and perrotettin E showed the strongest antibacterial activity with a MIC of 0.3 mg/mL against all 3 bacterial species examined in this study. The strongest anti-*Candida* potential was found for Marchantin E (MIC 0.6-1.2 mg/mL). On the other hand, the compound perrotettin F showed the lowest antibacterial potential (MIC 0.6-1.2 mg/mL) along with negligible anti-*Candida* activity (MIC 1.2-2.4 mg/mL). The compounds exhibited no cytotoxicity towards HaCaT cells at maximum concentration used 400 µg/mL making them posible for the safe use. Since MIC of the compounds (in the cases of bacteria) was lower than maximum non-toxic concentrations against human cells, it can be assumed that these results are relevant for future research and formulation of effective and safe antimicrobial agents.

Keywords: bis-bibenzyls, antimicrobial activity, anti-*Candida*, wound healing activity

ZNJ – 13

FUNKCIONALNA VEZA HALLUX VALGUS UGLOVA HVU I IMU PRIJE I POSLIJE OPERATIVNOG LIJEČENJA

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Sažetak: Hallux valgus je relativno čest i sa više aspekata kompleksan deformitet prednjeg dijela stopala. Rezultat je višestrukog djelovanja endogenih i egzogenih etioloških faktora sa različitim stepenom uticaja. Stepen deformiteta kod hallux valgusa je ocijenjen radiološkim vrijednostima hallux valgus ugla (HVU) i intermetatarzalnog ugla (IMU) i predstavlja funkciju te dvije promjenljive. Cilj rada je da se matematičko logičkom argumentacijom obrazloži opravdanost definisanja hallux valgus deformiteta kao funkcije jednog od uglova, (HVU ili IMU), a zatim izloži postupak izračunavanja stope promjene deformiteta poslije operativnog liječenja. U radu je, primjenom analitičko statističkih metoda i tehnika, ispitana funkcionalna veza HVU i IMU, kao i njihova funkcioalna veza sa hallux valgus deformitetom. Dobijene funkcionalne veze su provjerene na uzorku od 396 operativno liječenih stopala sa ovim deformitetom izračunavanjem prosječne vrijednosti koeficijenta proporcionalnosti tih uglova prije i poslije operativnog liječenja. Na osnovu tih, eksperimentom protvrđenih, rezultata, formulisana je i provjerena formula za izračunavanje stope promjene deformiteta prije i poslije operativnog liječanja. Izloženi analitički metod omogućava da se stepen hallux valgus deformiteta izrazi kvantitativno, kao i definisanje stope promjene i korekcije deformiteta nakon operativnog liječenja.

Ključne riječi: Funkcionalna veza uglova deformiteta, Hallux valgus, Intermetatarzalni ugao, Korekcija deformiteta

FUNCTIONAL RELATIONSHIP OF INTERMETATARSAL AND HALLUX VALGUS ANGLE BEFORE AND AFTER OPERATIVE TREATMENT

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Abstract: Hallux valgus is a relatively common and multifaceted complex deformity of the forefoot. It is the result of multiple effects of endogenous and exogenous etiological factors with different degrees of influence. The degree of hallux valgus deformity was determined by radiological values of hallux valgus angle (HVA) and intermetatarsal angle (IMA) and is a function of these two variables. The aim of the article is to explain the justification of defining hallux valgus deformity as a function of one of the angles (HVA or IMA) with mathematical and logical argumentation, and then to present the procedure for calculating the rate of change of the deformity after operative treatment. In this article, the functional connection of the HVA and IMA angles, and their functional connection with hallux valgus deformity, was examined using analytical statistical methods and techniques. The obtained functional connections were checked on a sample of 396 operatively treated feet with hallux valgus deformity by calculating the average values of the proportionality coefficient of those angles before and after operative treatment. Based on these, experimentally verified results, a formula for calculating the rate of change in deformity before and after surgical treatment was formulated and tested. The presented analytical method enables the degree of hallux valgus deformity to be expressed quantitatively, as well as to define the rate of change and correction of the deformity after operative treatment.

Key words: functional connection of deformity angles, Hallux valgus, intermetatarsal angle, correction of deformity

FIZIOTERAPIJA

PHYSIOTHERAPY

FT - 1

SNAGA ČETVOROGLAVOG MIŠIĆA BUTA NAKON REKONSTRUKCIJE PREDNJEG UKRŠTENOG LIGAMENTA

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Sažetak: Nakon hirurške rekonstrukcije prednjeg ukrštenog ligamenta koljena, u većini slučajeva dolazi do smanjenja snage četvoroglavog mišića buta. Iako se mnogo istražuje na tom polju, ne postoji jedinstven protokol rehabilitacije ovih pacijenata. Cilj rada je prikazati rezultate rehabilitacije oštećenog četvoroglavog mišića buta kod pacijenata nakon rekonstrukcije prednjeg ukrštenog ligamenta (LCA). Retrospektivnim istraživanjem praćeno je 180 pacijenata muškog pola, 15 sedmica nakon rekonstrukcije prednjeg ukrštenog ligamenta koljena. Pacijenti su podijeljeni u dvije ispitivane grupe prema vrsti rehabilitacionog protokola koji su provodili. Grupa A je u kineziterapiji koristila izokinetički protokol vježbanja koji se sastojao od izokinetičkog treninga trajanja 30 minuta, 6 x sedmično u trajanju od šest sedmica. Grupa B je provodila standardni kineziterapijski protokol baziran na izotoničnim vježbama. Efekat jačanja četvoroglavog mišića buta evaluiran je koncentrično-koncentričnim izokinetičkim testom pri ugaonoj brzini od 60°/s prije i nakon šest sedmica tretmana. Parametar praćenja je bio: prosječna snaga ekstenzora operisane noge (EXAVP) – W. Period praćenja je bio šest sedmica. Nađene su statistički značajne razlike ($p<0,05$) u praćenom parametru u obje grupe, a u grupi A je bio značajno veći nakon šest sedmica tretmana u odnosu na grupu B. Izokinetički protokol jačanja četvoroglavog mišića buta je bolji u odnosu na standardni tretman. Smatramo da su izokinetičke vježbe efikasnije u oporavku snage četvoroglavog mišića nakon rekonstrukcije LCA u odnosu na standardne vježbe.

Ključne riječi: četvoroglavi mišić buta, izokinetika, rekonstrukcija LCA, fizioterapija

QUADRICEPS MUSCLE STRENGTH AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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Abstract: After surgical reconstruction of the anterior cruciate ligament of the knee, in most cases there is a decrease of the quadriceps muscle strength. Although there is a lot of research in this field, there is no single rehabilitation protocol for these patients. The aim of the paper is to present the results of the damaged quadriceps muscle rehabilitation in patients after reconstruction of the anterior cruciate ligament (LCA). A retrospective study followed 180 male patients, 15 weeks after reconstruction of the anterior cruciate ligament. Patients were divided into two groups according to the type of rehabilitation protocol they underwent. In group A, patients performed protocol in kinesitherapy, which consisted of isokinetic training in a period of 30 minutes, 6 times a week for six weeks. Patients of group B performed a standard kinesitherapy protocol based on isotonic exercises. The effect of strengthening the quadriceps muscle was evaluated by a concentric-concentric isokinetic test at an angular velocity of 60°/s before treatment and after six weeks of treatment. The monitoring parameter was average strength of the operated leg knee extensors (EXAVP)-W. The monitoring period was six weeks. Statistically significant differences ($p<0.05$) were found in the monitored parameter in both groups, and in group A it was significantly higher after six weeks of treatment compared to group B. An isokinetic quadriceps strengthening protocol is better than a standard treatment. We believe that isokinetic exercises are more effective in recovering quadriceps strength after LCA reconstruction compared to standard exercises.

Key words: quadriceps muscle, isokinetics, ACL reconstruction, physiotherapy

FT - 2

PERIARTHRITIS HUMEROSCAPULARIS –PRIKAZ SLUČAJA

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Sažetak: Rameni pojas predstavlja karakterističan sistem međusobno povezanih kostiju ramena, koji omogućavaju maksimalnu pokretljivost gornjeg ekstremiteta. Zbog velike pokretljivosti ovaj segment je tokom života izložen uticaju brojnih etioloških faktora koji oštećuju njegove pojedine strukture. Periartritis humeroscapularis (PHS) predstavlja leziju okolozglobnih struktura ramena. Osnovnom kliničkom znaku, bolu u ramenu mogu da se pridruže ukočenost i slabost u ramenu. Liječenje bolnog ramena ima za cilj što ranije oslobađanje pacijenta od bola, mišićnog spazma, postizanje uredne pokretljivosti i mišićne snage ramenog pojasa. U fizioterapiji postoji veći broj procedura kojima se može sanirati ovo vanzglobno oboljenje. Cilj rada je prikazati individualne fizioterapijske postupke i procedure u procesu ambulantnog liječenja periarthritis humeroscpularis-a. U radu je prikazan slučaj pacijentice sa dijagnozom tendinis humeri calcificata. Prilikom određivanja funkcionalnog statusa rađeno je mjerenje obima pokreta u ramenu, manuelni mišićni test i mjerenje VSP razmaka obe ruke te procjena bola. Tokom ambulantnog liječenja, u trajanju od dvadeset dana, primjenjena je kineziterapija i više fizikalnih procedura (krioterapija, elektroforeza, laser, dijadinamske struje, magnet, sonoforeza). Nakon završenog ambulantnog liječenja praćeni parametri pokazali su poboljšanje, čime je potvrđeno da primjena kineziterapije i fizikalnih procedura daje izuzetne rezultate.

Ključne riječi : bol, periartritis humeroscapularis, kineziterapija, fizikalne procedure

PERIARTHRITIS HUMEROSCAPULARIS– CASE STUDY

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Abstract: The shoulder girdle is a characteristic system of interconnected shoulder bones, which enable maximum mobility of the upper limb. Due to its high mobility, this segment is exposed during its life to the influence of numerous etiological factors that damage its individual structures. Periarthritis humeroscapularis (PHS) is a lesion of the peri-articular structures of the shoulder. The basic clinical sign of shoulder pain may be accompanied by stiffness and weakness in the shoulder. The treatment of a painful shoulder aims to relieve the patient from pain, muscle spasm, achieve proper mobility and muscle strength of the shoulder girdle as soon as possible. In physiotherapy, there are a number of procedures that can be used to repair this extra-articular disease. The aim of the paper is to present individual physiotherapy procedures and procedures in the process of ambulatory treatment of periarthritis humeroscpularis. The paper presents the case of a patient diagnosed with tendinis humeri calcificata. When determining the functional status, the range of motion in the shoulder was measured, a manual muscle test and the VSP distance of both hands were measured, and pain was assessed. During the twenty-day outpatient treatment, kinesitherapy and several physical procedures were applied (cryotherapy, electrophoresis, laser, diadynamic currents, magnet, sonophoresis). After the outpatient treatment was completed, the monitored parameters showed an improvement, which confirmed that the application of kinesitherapy and physical procedures gives exceptional results.

Key words: pain, periarthritis humeroscapularis, kinesitherapy, physical procedures

FT – 3

EVALUACIJA PRIMJENE STANDARDIZOVANIH TESTOVA ZA PROCJENU FUNKCIONALNOG STANJA OSOBA NAKON MOŽDANOG UDARA

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Sažetak: Hemipareza predstavlja sindrom oštećenja mozga koji dovodi do motorne slabosti jedne polovine tijela praćene sa promjenom senzibiliteta, govora, kao i čestim psihičkim i drugim promenama bolesnika. Testovi korišteni za mjerenje funkcionalnog oporavka bolesnika sa hemiparezom u kineziterapiji su *Barthel Indeks (BI), Trunk Control Test (TCT), Motoricity index (MI), Ashworth Scala (ASHS), Test UP&GO (TUG).* Cilj rada je bio da se ispita senzitivnost, specifičnost i ukupna tačnost primjenjivanih testova (*BI, TCT, MI, ASHS, TUG)* kroz procjenu stepena oporavka motornih funkcija, stepena osposobljenosti za aktivnosti svakodnevnog života i analizu efekata kineziterapijskog tretmana bolesnika sa hemiparezom. Istraživanje predstavlja retrospektivnu analizu rehabilitacionog terapijskog tretmana kod 148 bolesnika sa hemiparezom, oba pola, starosti od 45-87, na Odjelenju B za neurorehabilitaciju u Institutu FMIR "Dr Miroslav Zotović" Banja Luka. Standardizovani testovi koje smo koristili na početku i kraju tretmana su: Trunc Control Test, Motoricity Index, Ashworth Scala, Test UP&GO i Barthel. Statističku obradu podataka smo vršili primjenom testa Medijane i Wilcoxon-ovog testa sume rangova, a zatim smo ispitivali njihovu senzitivnost, specifičnost i ukupnu tačnost. Svi podaci koji su dobijeni primjenom navedenih testova su obrađeni i na osnovu njih je vršena procjena stanja bolesnika, upoređivani su testovi sa varijablama (pol, strana lezije, starosne grupe) i ispitivana je njihova senzitivnost (Se), specifičnost (Sp) i ukupna tačnost (UT). Korišteni testovi su pokazali statistički značajna poboljšanja funkcinalnog statusa na otpustu u odnosu na prijem izuzev kod Ashwort skale gde nismo imali statistički značajnog poboljšanja na kraju tretmana. Izdvojili smo Barthel Index kao zlatni standard za procjenu senzitivnosti, specifičnosti i ukupne tačnosti ostalih testova. Najznačajnije rezultate pokazao je test UP&GO (Se=74,2%, Sp= 40%, UT= 77%), zatim MI (Se= 71.7%, Sp= 30%, UT=68.9%) a najniže vrijednosti među njima je imao TCT (Se= 52.9%, Sp= 80% i UT= 54.7%). Pokazalo se da nisu svi primenjeni testovi jedanko validni, senzitivni i specifični za procjenu funkcionalnog stanja bolesnika sa hemiparezom.

Ključne riječi: procjena, mjerni instrumenti, moždani udar

EVALUATION OF THE APPLICATION OF STANDARDIZED TESTS FOR ASSESSING THE FUNCTIONAL STATE OF PEOPLE AFTER A STROKE

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Abstract: Hemiparesis is a syndrome of brain damage that leads to motor weakness of one half of the body accompanied by changes in sensitivity, speech, as well as frequent psychological and other changes in the patient. The tests we use to measure the functional recovery of patients with hemiparesis in kinesitherapy are Barthel Index (BI), Trunk Control Test (TCT), Motoricity index (MI), Ashworth Scala (ASHS), Test UP& GO (TUG). The aim of the work was to examine the sensitivity, specificity, and overall accuracy of the applied tests (BI, TCT, MI, ASHS, TUG) through the assessment of the degree of recovery of motor functions, the degree of competence for activities of daily life and the analysis of the effects of kinesitherapy treatment of patients with hemiparesis. The research is a retrospective analysis of rehabilitation therapy treatment in 148 patients with hemiparesis, both sexes, aged 45-87, conducted at Department B in the Institute of Physical Medicine "Dr. Miroslav Zotović" Banja Luka. The standardized tests we used at the beginning and end of the treatment are: Trunk Control Test, Motoricity Index, Ashworth Scala, Test UP& GO and Barthel. We performed statistical processing of the data using the Median test and the Wilcoxon rank sum test, and then examined their sensitivity, specificity and overall accuracy. Variables (gender, side of lesion, age groups) and their sensitivity (Se), specificity (Sp) and overall accuracy (UT) were investigated. The tests used showed significant improvements in functional status at discharge compared to admission except for the Ashworth scale where we did not have a significant improvement at the end of the treatment. We singled out the Barthel Index as the gold standard for assessing the sensitivity, specificity and overall accuracy of other tests. The most significant results were shown by the UP&GO test (Se=74.2%, Sp= 40%, UT= 77%), followed by MI (Se= 71.7%, Sp= 30%, UT= 68.9%), and the lowest values among them were TCT (Se= 52.9%, Sp= 80% and UT= 54.7%). It has been shown that not all applied tests are equally valid, sensitive and specific for assessing the functional state of patients with hemiparesis.

Keywords: assessment, measuring instruments, stroke

FT - 4

UTICAJ KINEZITERAPIJE NA FIZIČKU AKTIVNOST U TRUDNOĆI

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Sažetak: Fizička aktivnost u trudnoći podstiče muskuloskeletni, kardiovaskularni, respiratorni sistem, poboljšava kondiciju, održava snagu i elastičnost mišića. Smanjuje rizik od prekomjerne težine, gestacijskog dijabetesa, preeklampsije, prevremenog porođaja i postporođajne depresije. Cilj rada bio je ispitati uticaj kineziterapije na nivo fizičke aktivnosti trudnica. U Crnoj Gori je 2018. godine (februar-avgust) na primarnom nivou zdravstvene zaštite sprovedena prospektivna longitudinalna studija. Po odobrenju ginekologa-akušera u istraživanje dobrovoljno su regrutovane 34 trudnice trećeg trimestra trudnoće iz Herceg Novog (n=29) i Cetinja (n=5). Tokom četiri nedelje sprovodila se prenatalna priprema za porođaj, bazirana na kineziterapiji, u grupama (n= 4-6) trudnica. Kroz 8 sesija od 30 minuta, uz nadzor fizioterapeuta izvođene su vježbe disanja, poboljšanja cirkulacije, posture, mobilnosti zglobova i jačanja oslabljenih mišića. Učesnice su svakodnevno šetale 30 minuta. Dozirani nivo opterećenja, intenziteta 3-4 usklađen je s modifikovanom Borgovom skalom percipiranog napora eng. Borg rating of perceived exertion (RPE). Istraživački instrument bio je međunarodni upitnik o fizičkoj aktivnosti eng. The International Physical Activity Questionnaire (IPAQ-SF). Nivo fizičke aktivnosti analiziran je početkom i dvije nedjelje po završetku priprema. Starosna dob regrutovanih učesnica: 20-30 godina (63%), 31 - 40 godina (34%), iznad 40 godina (3%). Obrzovni nivo: srednja stručna sprema (60%), viša stručna sprema (6%), visoka stručna sprema (3%). Nivo fizičke aktivnosti: minimalan (n=10), umjeren (n=18), intezivan (n=6). Analiza rezultata pokazala je poboljšanje nivoa fizičke aktivnosti kod sedam učesnica. Prosječna ukupna potrošnja energije početkom priprema iznosila je 1649,82 MET minuta, a kontrolna 1882,35 MET minuta. Trudnice treba podsticati na prenatalnu pripremu jer nadgledan kineziterapijski protokol povećava nivo fizičke aktivnosti.

Ključne riječi: trudnice, fizička aktivnost, kineziterapija, psihofizička priprema za porođaj

INFLUENCE OF PHYSIOTHERAPY ON PHYSICAL ACTIVITY IN PREGNANCY

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Abstract: Physical activity during pregnancy stimulates the musculoskeletal, cardiovascular and respiratory systems, improves fitness, maintains muscle strength and elasticity. It reduces the risk of overweight, gestational diabetes, preeclampsia, premature birth and postpartum depression. The aim of the work was to examine the impact of kinesitherapy on the level of physical activity of pregnant women. A prospective longitudinal study was conducted in Montenegro in 2018 (February-August) at the primary level of health care. With the approval of the gynecologist-obstetrician, 34 pregnant women in the third trimester of pregnancy from Herceg Novi (n=29) and Cetinje (n=5) were voluntarily recruited into the study. During four weeks, prenatal preparation for childbirth, based on kinesitherapy, was carried out in groups (n= 4-6) of pregnant women. During 8 sessions of 30 minutes, under the supervision of a physiotherapist, breathing exercises, improving circulation, posture, joint mobility and strengthening weakened muscles were performed. The participants walked for 30 minutes every day. The dosed load level, intensity 3-4, is aligned with the modified Borg scale of perceived effort (RPE). The research instrument was a international questionnaire on physical activity The International Physical Activity Questionnaire (IPAQ-SF). The level of physical activity was analyzed at the beginning and two weeks after the preparation. Age of recruited participants: 20-30 years (63%), 31-40 years (34%), over 40 years (3%). Level of education: secondary (60%), higher (6%), BA (3%). Level of physical activity: minimal (n=10), medium (n=18) and intensive (n=6). The analysis showed an improvement in the level of physical activity in seven participants. The average total energy consumption at the beginning of the preparations was 1649.82 MET minutes, and the control 1882.35 MET minutes. Pregnant women should be encouraged to prepare prenatally because a supervised kinesitherapy protocol increases the level of physical activity.

Keywords: pregnant women, physical activity, kinesitherapy, psychophysical preparation for childbirth

FT - 5

ZDRAVSTVENI ASPEKTI VJEŽBANJA I TRENAŽNOG PROCESA SPORTISTA SA INVALIDITETOM

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Sažetak: Sport je jedan od načina na koji djeca, mladi i odrasle osobe sa invaliditetom, mogu uzeti aktivnije učešće u društvenom životu, razvijati svoje talente i otvarati nove prilike. Koristi od sporta su široko prihvaćene i poznate i obuhvataju: poboljšanje opšte kondicije (izdržljivosti), mišićne snage, ravnoteže, fleksibilnosti, posturalne kontrole i adaptacija na postojeće tjelesne nedostatke. Osnovni zadatak trenera osoba sa invaliditetom je da se usmjeri na razvoj preostalih sposobnosti i postavi, u perspektivi, realno ostvarive ciljeve. Cilj rada je bio da se da pregled literature vezane za zdravstvene aspekte vježbanja koje trener i njegov tim treba da imaju u vidu prilikom rada, a sreću se kod sportista iz četiri velike paralimpijske grupe invaliditeta: amputacije, cerebralna paraliza, povreda kičmene moždine i sljepilo i slabovidost. Pri procjeni zdravstvenih rizika kod sportista sa invaliditetom potrebno je obratiti pažnju na veći broj faktora kao što su specifičnost oštećenja/oboljenja, nivo takmičenja, vrsta sporta, oprema i rekviziti koji se koriste u treningu i takmičenju, psihološko stanje i psihološka zrelost sportiste.

Ključne riječi: sport osoba sa invaliditetom, trening, amputacije, cerebralna paraliza, slijepilo

HEALTH ASPECTS OF EXERCISE AND TRAINING PROCESS OF ATHLETES WITH DISABILITIES

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Abstract: Sports participation is one of the best ways for children, young people and adults with disabilities to take a more active part in social life, develop their talents and open up new opportunities. The benefits of sports are widely accepted and known and include: improvement of general fitness (endurance), muscle strength, balance, flexibility, postural control and adaptation to existing physical deficiencies.The main task of the coach of persons with disabilities is to focus on the development of the remaining abilities and set, in perspective, realistically achievable goals. The main goal of the paper is to provide a literature review related to the health aspects of exercise that the coach and their team should keep in mind when working with athletes from the four major Paralympic groups of disabilities: amputations, cerebral palsy, spinal cord injury and blindness and low vision. When assessing health risks in athletes with disabilities, it is necessary to pay attention to a number of factors such as the specificity of disability/disease, level of competition, type of sport, equipment, devices and aids used in training and competition, psychological condition and psychological maturity of the athlete.

Keywords: disability sports, training, amputations, cerebral palsy, blindness

FT - 6

DIJAGNOSTIKA I LIJEČENJE „ZEBRIS“ APARATOM U FIZIOTERAPIJI

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Sažetak: Savremene metode dijagnostike i liječenja su nedovoljno zastupljene u našem regionu. Samo analiza hoda, posmatranje i proučavanje načina hoda (GAIT) može uvesti u istoriju, ali pretpostavku toka bolesti samog pacijenta, a da pregled nije ni počeo. Korištenjem „Zebris“ aparata može se detaljnije odrediti dijagnoza same bolesti i na osnovu određivanja njene prirode, liječiti samu bolest na savremene, učinkovitije načine, pomoću softvera koji omogućava sprovođenje treninga hoda u virtuelnoj realnosti, uz izvođenje zadataka koji zahtjevaju stalne varijacije u hodu i balansiranju, koje ujedno motivišu i pacijenta i terapeuta ka boljem, bržem i efikasnijem liječenju. U radu se govori o evoluciji čovjeka i bipedalizma, biomehanici i aktivnosti mišića u fazi hoda, odnsu zglob-pokret-mišić, ulogama segmenata tijela u hodu, ciklusu hoda, i kako se sve to može pratiti uz pomoć „Zebris“ aparata. Opis kako sam aparat radi, dijagnostika i parametri koji se dobijaju ovim aparatom, su srž rada, jer na osnovu njega se može izvšiti komparacija hoda zdrave i bolesne osobe. Takođe, „Zebris“ pruža mogućnost sprovođenja terapije u cilju osposobljavanja za aktivnosti dnevnog života (ADŽ) uz praćenje parametara hoda na senzornoj traci, upotrebu ekrana, kao jedan od oblika povratne informacje, koji daje pacijentu i fizioterapeutu novu dimenziju terapije, ali i mogućnost da se i kognitivne vještine pacijenta iskušaju i unaprijede u samoj fazi oporavka. Cilj ovog rada odnosi se na proširenje vidika i mogućnosti koje ovaj aparat pruža, ali i na razvoj novih tehnologija, virtuelne realnosti i vještačke inteligencije (eng. artificial intelligence - AI) koje dijagnostiku i rehabilitaciju u fizioterapiji mogu podići na jedan sasvim novi nivo i koji će Bosnu i Hercegovinu približiti Evropi u njenom svakodnevnom radu. Ovo istraživanje dokazuje da dijagnostika i liječenje „Zebris“ aparatom vodi fizioterapiju ka novim tehnologijama u Bosni i Hercegovini.

Ključne riječi: „Zebris“, dijagnosta, liječenje, hod, nove tehnologije

DIAGNOSIS AND TREATMENT USING "ZEBRIS" DEVICE IN PHYSIOTHERAPY

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Abstract: Modern diagnostic and treatment methods are not sufficiently represented in our region. Only Gait Analysis, Observation and Study of Gait can introduce us to the history of the patient's disease and its course without even starting the examination. By using the "Zebris" device, the diagnosis itself can be determined in more details and based on the disease's nature, it can be treated in modern, more effective and interesting ways, using software that enables the implementation of walk training in virtual reality, while performing tasks that require constant walking and balancing variations, which at the same time motivate both the patients and the therapists towards better, faster and more efficient treatment. In the paper, the evolution of man and bipedalism, biomechanics and muscle activity in walking phases, the joint-movement-muscle relationship, the roles of body segments in walking, the walking cycle, and how all this can be monitored using the "Zebris" is discussed. The core of the work are methods which this device uses to work, diagnos and parameters obtained by this device, because based on them it is possible to compare the gait of a healthy and person with disability. Also, "Zebris" offers the possibility of carrying out therapy with the aim to improve the activities of daily life (ADL) with monitoring of gait parameters on the sensor tape, the usage of screens, as one of the forms of feedback, which gives the patient and the physiotherapist a new dimension of therapy, but also the possibility to test and improve the patient's cognitive skills in the recovery phase itself. The goal of this work is to expand the horizons and possibilities that this device gives, to develop new technologies, virtual reality and artificial intelligence (AI) of this device, that can raise diagnostics and rehabilitation in physiotherapy to a completely new level and that will bring Bosnia and Herzegovina closer to Europe in its daily work. This research proves that diagnostics and treatment with the "Zebris" device leads physiotherapy towards new technologies in Bosnia and Herzegovina.

Keywords: "Zebris", diagnosis, treatment, gait, new technologies

FT – 7

MOGUĆNOSTI KORIŠTENJA PROTEINA SURUTKE KAO SUPLEMENATA U ISHRANI SPORTISTA

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Sažetak*:* Proteini su gradivne jedinice ljudskog tijela te su potrebni za izgradnju: mišića, krvi, unutrašnjih organa, kostiju i noktiju, te tetiva, kože, hormona, enzima, neurotransmitera i drugo. Međutim, u ishrani vrhunskih sportista, iako kvalitetni proteini igraju važnu ulogu u ukupnom energetskom bilansu, oni se po pravilu standardnom ishranom ne mogu unijeti u dovoljnoj količini u organizam. Proteini surutke se smatraju najvrednijim proteinima u smislu da sadrže najviše aminokiselina razgranatog lanca (BCCA: leucin – Leu, izoleucin – Ile i valin - Val) te dobro izbalansiran odnos između esencijalnih aminokiselina, što ih čini osnovnim suplementima u ishrani vrhunskih sportista, ali i rekreativaca. Velika razlika u biološkom kvalitetu proteina surutke, u odnosu na druge proteine, potiče od visokog sadržaja lizina i tioaminokiselina cisteina i metionina. Odnos ovih aminokiselina bitan je za iskorištenje proteina u organizmu koji je u surutkinim proteinima daleko veći nego u kazeinu, jajetu, govođem mesu, soji, grašku i dr. Koncentracija leucina, izoleucina i valina (aminokiseline razgranatih lanaca) je neophodna pri napornom mišićnom radu sportista jer se, za razliku od drugih, ove esencijalne aminokiseline direktno metaboliziraju i koriste u izgradnji tkiva tokom vježbanja i kondicionih treninga. S druge strane, glutamin je nezamjenljiv suplement kod vrhunskih sportista jer se pri intenzivnim i napornim sportskim treninzima njegove zalihe (kojih je oko 60% od svih slobodnih aminokiselina) brzo troše, što dovodi do pada imuniteta i fizičke iscrpljenosti. Cilj rada je bio da se prikaže pregled dosadašnjih istraživanja vezanih za značaj surutkinih proteina u ishrani, sa posebnim akcentom na njihov potencijal i primjenu kao suplemenata u ishrani vrhunskih sportista.

Ključne riječi: proteini surutke, nutritivna vrijednost, suplementi, sportisti

POSSIBILITIES OF USING WHEY PROTEIN AS SUPPLEMENTS IN THE NUTRITION OF ATHLETES

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Abstract: Proteins are the building blocks of the human body and they are needed to build: muscles, blood, internal organs, bones and nails, tendons, skin, hormones, enzymes, neurotransmitters and more. However, in the nutrition of top athletes, although high-quality proteins play an important role in the overall energy balance, as a rule, they cannot be taken into the organism in sufficient quantity with a standard nutrition. Whey proteins are considered the most valuable proteins in the sense that they contain the most branched chain amino acids (BCCA) and a well-balanced ratio between essential amino acids, which makes them essential supplements in the nutrition of top athletes and recreational athletes. The big difference in the biological quality of whey protein, compared to other proteins, comes from the high content of lysine and the thioamino acids cysteine and methionine. The ratio of these amino acids is important for the utilization of protein in the body, which is far greater in whey proteins than in casein, egg, beef, soy, peas, etc. The concentration of leucine, isoleucine and valine (branched chain amino acids) is necessary during strenuous muscular work of athletes because, unlike others, these essential amino acids are directly metabolized and used in tissue building during exercise and conditional training. On the other hand, glutamine is an irreplaceable supplement for top athletes because during intense and strenuous sports training, its stores (which are about 60% of all free amino acids) are quickly used up, which leads to a drop in immunity and physical exhaustion. The aim of the paper is to present an overview of previous research related to the importance of whey proteins in nutrition, with a special emphasis on their potential and application as supplements in the diet of top athletes.

Key words: whey proteins, nutritional value, supplements, athletes

FT - 8

FIZIOTERAPIJA U ONKOLOGIJI – IZAZOV I PRILIKA

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Sažetak: Maligna oboljenja danas predstavljaju jedno od najčešćih oboljenja, te su u većini zemalja po smrtnosti na drugom mjestu. Incidenca oboljevanja je u stalnom porastu, a smatra se da će do 2040. godine broj oboljelih iznositi blizu 30 miliona. Maligna oboljenja najčešće pogađaju pluća, dojku, glavu kao i debelo crijevo. Dugo je važio stav da onkološki pacijenti nemaju perspektivu, te da je rehabilitacija ovih pacijenata nepotrebna, a sa tragovima takvih mišljenja susrećemo se i danas. Cilj ovog rada jeste pokazati koliki je značaj onkološke reahabilitacije i njen pozitivan uticaj na kvalitet i produženje života ovih pacijenata. Onkološku rehabilitaciju započinjemo kvalitetnom procjenom, na osnovu koje se pravi program rada. Kako su osnovni problemi onkoloških pacijenata bol, ožiljna tkiva nakon operacionog zahvata, limfedem, smanjenje mišićne mase i snage, loša tolerancija napora te se i onkološka rehabilitacija zasniva na tretiranju i smanjenju navedenih simptoma. Adekvatna edukacija od strane fizioterapeuta, primjena manuelnih tehnika, vježbi, kinezitejpinga, elektroterapije dovešće do ublažavanja ali često i do poptpune eliminacije simptoma. U nekim zemljama sa rehabilitacijom se započinje još u operacionoj sali, odmah po završetku zahvata. Posebna pažnja posvećuje se prevenciji, edukaciji stanovništva o faktorima rizika i kako se promjenom načina života može uticati na iste. Takođe, upoznati stanovništvo o prirodi ovih bolesti i edukovati ih o tome da svaka ova dijagnoza ne znači neminovno i smrtni ishod već nastavak kvalitetnog života. Kao najznačajnija karika uspješne rehabilitacije izdvaja se timski rad. Usaglašena aktivnost i komunikacija svih zdravstvenih radnika koji učestvuju u liječenju onkološkog pacijenta, jeste jedini dobar put od postavljanja dijagnoze do maksimalnog osposobljavanja pacijenta i vraćanja njegovim svakodnevnim aktivnostima. Možemo li reći da smo svjedoci (r)evolucije onkoloških pacijenata?

Ključne riječi: Onkološka rehabilitacija, tumori, fizioterapija, timski rad, prevencija

PHYSIOTHERAPY IN ONCOLOGY- CHALLENGES AND OPPORTUNITIES

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Abstract: Malignant diseases are currently one of the most common diseases and are the second leading cause of death in most countries. The incidence of the disease is constantly increasing, and it is estimated that by 2040, the number of patients will be close to 30 million. Malignant diseases most commonly affect the lungs, breasts, head, and large intestine. It has long been believed that oncology patients have no perspective and that the rehabilitation of these patients is unnecessary, but we still encounter traces of such beliefs today. The goal of this work is to demonstrate the importance of oncological rehabilitation and its positive impact on the quality and length of life of these patients. Oncological rehabilitation begins with a quality assessment, upon which a work program is based. As the basic problems of oncology patients are pain, scar tissue after surgery, lymphedema, reduction in muscle mass and strength, poor endurance, efforts are made to address these issues. Special attention is paid to prevention and educating the population about risk factors and how changing their lifestyle can affect them. Additionally, the population is informed about the nature of these diseases and educated about the fact that such a diagnosis does not necessarily mean a fatal outcome but rather the continuation of a quality life. The most significant link in successful rehabilitation is considered to be teamwork. The coordinated activity and communication of all healthcare professionals involved in the treatment of an oncology patient is the only good way from diagnosis to maximum patient rehabilitation and return to their daily activities. Can we say that we are witnessing a revolution in the rehabilitation of oncology patients?

Key words: Oncology rehabilitation, tumors, physiotherapy, teamwork, prevention

RADNA TERAPIJA

OCCUPATIONAL THERAPY

RT - 1

PRAKSA TEMELJENA NA DOKAZIMA U RADNOJ TERAPIJI

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Sažetak: Rad će prikazati zašto je u radno terapijskoj praksi potrebno razumijevanje prakse temeljene na dokazima. U kontinuirani razvoj radno terapijske struke uvedena je praksa temeljena na dokazima kako bi pomogla razvoju kliničkih usluga i potkrijepila učinke radno terapijskih usluga o sve većem javnom kredibilitetu. Praksa temeljena na dokazima je klinički okvir donošenja odluka koji potiče kliničare da integriraju informacije iz visokokvalitetnih kvantitativnih i kvalitativnih istraživanja s kliničkom stručnošću i korisnikovim iskustvom, preferencijama i vrijednostima pri donošenju odluka. Donošenje kliničkih odluka je složen, dinamičan i fluidan proces koji uključuje prikupljanje podataka iz više izvora, tumačenje i razmišljanje o prikupljenim podacima, suradnju s korisnikom i drugim stručnjacima, odabir smjera djelovanja i procjenu ishoda izbora. Praksa temeljena na dokazima nije samo korištenje dokaza istraživanja. Ona obuhvaća upotrebu i vrednovanje obrazovanja, vještina i iskustva radnih terapeuta. Također razmatra kontekst i vrijednosti korisnika pri donošenju odluke, kao i razmišljanju o nijansama specifičnog konteksta u kojem se radno terapijska praksa izvodi. Sve navedeno zahtijeva od radnih terapeuta vještine kliničkog rasuđivanja i korištenja znanosti. Istraživanja su samo jedan resurs na koji se možemo osloniti pri donošenju kliničkih odluka. U konačnici kliničko rasuđivanje i stručnost te promišljeni dijalog s korisnicima ostaju u središtu radno terapijske prakse. Radno terapijska struka ima stalnu obvezu podupirati radne terapeute koji se odluče provoditi sustavna i održiva istraživanja.

Ključne riječi: praksa temeljena na dokazima, radna terapija, kliničko rasuđivanje, istraživanje

EVIDENCE BASED PRACTICE IN OCCUPATIONAL THERAPY

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Abstract: This article will show the importance of understanding evidenced based practice in occupational therapy. Evidence based practice was introduced into the constant development of occupational therapy to help the development of clinical services and to support the performance of occupational therapy services and to increase public credibility. Evidence based practice is a clinical framework for making decisions based upon integrating information from high quality and quantity research with clinical expertise, experience, preferences and values of the user into the decision making process. Making clinical decisions is a complicated, dynamic, and fluid process that involves gathering data from several sources, the interpretation, and opinions of the said data, collaboration with the user and other experts, choice of direction and prediction of outcome. Evidence based practice is not only the use of evidence from research. It also includes the use and valuation of education, skills, and experiences of the occupational therapist. This requires skills of clinical reasoning by the occupational therapist and usage of science. Research is just one resource upon which we can rely while making clinical decisions. In the end clinical reasoning, expertise and thoughtful dialog with the user are central in occupational therapy practice. Occupational therapy profession has a constant obligation to support the occupational therapists who want to conduct systematic and sustainable research.

Keywords: evidence based practice, occupational therapy, clinical reasoning, research

RT - 2

UPOTREBA KOHLMANOVE PROCJENE ŽIVOTNIH VJEŠTINA U SLOVENIJI

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Sažetak: Kohlman Evaluation of Living Skills (KELS) je evaluacija radne terapije. Dizajniran je da odredi sposobnost osobe da funkcionira u osnovnim životnim vještinama i pomaže u identifikaciji područja u kojima osoba može djelovati i onih u kojima je osobama potrebna pomoć. Sedamnaest životnih vještina testira se u pet oblasti: briga o sebi, sigurnost i zdravlje, upravljanje novcem, transport i telefon i rad i slobodno vrijeme. Svrha našeg istraživanja bila je identificirati područja u kojima je osobama s mentalnim poremećajima i starijim osobama potrebna pomoć. U prvom istraživanju, 2013 godine, uporedili smo dvije grupe učesnika starosti između 25 i 65 godina: grupa 1 je bila 120 učesnika bez dijagnoze duševnih bolesti, grupa 90 učesnika sa dugotrajnom dijagnostikom u duševnom zdravlju. U dve druge, 2016 u 2020, smo ocjenjivali svakodnevne aktivnosti među 84 starijih sudionika. Svi duševno zdravi sudionici u prvim istraživanjima tako da su bili ocijenjeni kao »neovisni«, jednako ocijenjeno je bilo samo 48 osoba iz grupe koje su smetnjama u duševnom zdravlju. Mann-Whitney U test u ovom istraživanju otkriva da postoje značajne razlike u izvođenju svih aktivnosti između grupe 1 i grupe 2. Prema rezultatima dobijenim kod starijih sudionica javljaju se problemi u poznavanju brojeva za hitne slučajeve, prepoznavanju opasnih situacija, rukovanju novcem, mobilnost i sudjelovanje u slobodnim aktivnostima. KELS se može koristiti za procjenu potrebnih svakodnevnih životnih vještina i za brzi pregled funkcioniranja starije osobe. To je od velike pomoći multidisciplinarnom timu u planiranju radno-terapijskog tretmana i pronalaženju načina da ostane nakon otpusta iz bolnice. Stručna pomoć ima smisla samo u individualnom okruženju osobe.

Ključne riječi: životne vještine, procjena, funkcionisanje, nivo pomoći, okruženje

APPLYING THE KOHLMAN EVALUATION OF LIVING SKILLS IN SLOVENIA

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Abstract: Kohlman Evaluation od Living Skills (KELS) is an occupational therapy evaluation. It is designed to determinate a person´s ability to function in basic living skills and helps identify the areas in which a person can perform and those in which the persons need assistance. Seventeen living skills are tested under five areas: Self-Care, Safety and Health, Money Manegement, Transportation and Telephone and Work and Leisure. The poupose of our researches were do identify areas in which people with mental health disorders and elderly need assistance. In the first research, 2013, we compared two group of participants, aged between 25 and 65: group 1 were 120 participants with no diagnosis of mental health disability, group 2 90 participants with diagnosed long-term mental health disability. Another two researches, 2016 and 2020, we evaluated the everyday activities among 84 older participants. All mentally healthy subjects in the first research were assessed as "Independent" and only 48 subjects from group with mental health disability were assessed as "Independent. Mann-Whitney U test in this research states that there are significant differences in the execution of all activities between the group 1 and group 2. According to the obtained results from older participants problems occur in knowing emergency numbers, identiying dangerous situations, handling money, mobility and participation in leisure activities. KELS can be used to assess the daily living skills needed and to provide a quick overview of the older person's functioning. It is a great help to the multi-disciplinary team in planning occupational therapy treatment and finding a way to stay after discharge from hospital. Professional help is only reasonable in the individual's own environment.

Keywords: living skills, assessment, functionig, level of assistance, environment

RT - 3

PRIMJENA SOMATO-PSIHO-SOCIO-SEMNIOTIČKIH OKVIRA U RADNOJ TERAPIJI KROZ PARADIGMU HOLISTIČKE SKRBI ZA BOLESNIKA

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Sažetak: Bolest i zdravlje su singularni pojmovi ,koji se prije svega odnose na ljudsko stanje, koje odražava harmoniju ili disharmoniju. Moderni tempo života svakodnevno uvjetuje stanje disbalansa koje prepoznajemo u porastu oboljelih osoba. Razumjeti stanje pacijenta kroz simptome bolesti u današnje vrijeme nije dovoljno, zdravstveni djelatnici u svakodnevnoj skrbi za pacijenta trebaju težiti cjelovitom pristupu koji se temelji na holističkoj medicini. Somato-psiho-socio-semniotičke paradigme zdravlja, uveliko doprinose razumijevanju značenja holističkog pristupa - holističke skrbi za pacijenta. Cilj rada je proširiti postojeća znanja o zdravlju-bolesti, kao stanja ravnoteže i narušene ravnoteže, na razini somatskog-psihološkog-socijalnog–semniotičkog, što otvara nove perspektive u sagledavanju potreba pacijenta i daljnjih mogućnosti liječenja i rehabilitacije. Rad opisuje osnovni koncept somato-psiho-socio-semniotičke paradigme zdravlja kroz prikaz slučaja što dodatno omogućava razumijevanje značenja holističke skrbi za pacijenta.

Ključne riječi: bolest, zdravlje, holistički pristup, holistička skrb

APPLICATION OF THE SOMATO-PSHO-SOCIO-SEMNIOTIC FRAMEWORK IN OCCUPATIONAL THERAPY THROUGH THE PARADIGM OF HOLISTIC CARE

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Abstract: Illness and health are singular terms that primarily refer to the human condition, which reflects harmony or disharmony. The modern life causes a state of imbalance every day, which we recognize in the increase of sick people. Understanding the patient's condition through the symptoms of the disease is not enough nowadays, health professionals should strive for a comprehensive approach based on holistic medicine in the daily care of the patient. Somato-psycho-socio-semniotic paradigms of health greatly contribute to the understanding of the meaning of the holistic approach - holistic care for the patient. The goal of this article is to expand the existing knowledge about health-disease, as states of balance and disturbed balance, at the somatic-psychological-social-semniotic level, which opens up new perspectives in looking at the patient's needs and further treatment and rehabilitation options. This article describes the basic concept of the somato-psycho-socio-semniotic paradigm of health through a case presentation, which additionally enables the understanding of the meaning of holistic care for the patient.

Keywords: disease, health, holistic approach, holistic care

RT - 4

SJEDENJE - PROBLEM JAVNOG ZDRAVLJA

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Sažetak: Sjedenje je značajan javnozdravstveni problem. Mnogi administrativni radnici, učenici raznih srednjih škola i studenti sjede veći dio dana. Dugotrajan sjedeći rad negativno utječe na mišićno-koštane poremećaje, rak, dijabetes tipa 2, depresiju i prekomjernu težinu. Mnoge zemlje usvojile su preporuke za smanjenje sedentarnosti i uvode strategije za smanjenje vremena sjedenja na radnom mjestu. Željeli smo saznati količinu sjedilačkog ponašanja i korištenje strategija za smanjenje sjedilačkog ponašanja. Prikupljanje podataka obavljeno je u periodu od 2016. do 2017. godine. Uzorak je obuhvatio 741 ispitanika, 557 zaposlenih i 184 učenika. Korišten je modificirani Sedentary Behaviour Questionnaire (SBQ), koji su ispitanici ispunjavali putem samoprocjene za jedan radni dan. Prosječno dnevno vrijeme sjedenja za sve predmete bilo je 9 sati, između 10 i 11 sati za administrativno osoblje i više od 13 sati za učenike različitih srednjih škola i studente. Na osnovu rezultata istraživanja sproveli smo pilot projekat o smanjenju vremena sjedenja u 2018. godini. Svrha projekta je bila utvrditi da li je produženo sjedenje smanjeno korištenjem strategija zasnovanih na dokazima. Ispitanici (N = 85) bili su učenici raznih srednjih škola, učenici i administrativno osoblje, samo oni (N = 65), koji su na prvom samoprijavljivanju u radnom danu u prosjeku pokazali najmanje 8 sati sjedenja. Kroz edukaciju u oktobru i novembru 2018. godine pozvali smo ispitanike da jedan mjesec volontiraju kako bi učestvovali u projektu „Smanjenje vremena sjedenja". Samo 37 smanjilo je ukupno dnevno vrijeme sjedenja za dva sata. Nedostatak projekta "sjedenje" je kratkotrajnost i samoizvještavanje. Unatoč ograničenjima, svi istraživači pokazuju da je sjedilačko ponašanje ozbiljan problem i u Sloveniji. Sjedeće radno vrijeme je teško smanjiti, osim povećanja fizičkih aktivnosti, važno je smanjiti vrijeme sjedenja.

Ključne riječi: sjedilačko ponašanje, smanjenje sjedećeg ponašanja, strategije, javno zdravlje

SITTING - A PUBLIC HEALTH PROBLEM

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Abstract: Sitting is a significant public health problem. Many administrative staff, students of various secondary schools and students sit most of the day. Prolonged sedentary work has an adverse impact to musculoskeletal disorders, cancer, type 2 diabetes, depression and overweight. Many countries have adopted recommendations to reduce sedentariness. We wanted to find out the amount of sedentary behaviour and the use of strategies to reduce sedentariness. Data collection took place between 2016 and 2017. The sample included 741 subjects, 557 employees and 184 students. A modified Sedentary Behaviour Questionnaire (SBQ) was used, which subjects completed via self-report for one working day. The average daily sedentary time for all subjects was 9 hours, between 10 and 11 hours for administrative staff, and more than 13 hours for students of various secondary schools and students. Based on the results of the research, we carried out a pilot project on reducing sitting time in 2018. The purpose of the project was to determine whether prolonged sitting was decreased by using evidence-based strategies. The subjects (N = 85) were students of various secondary schools, students and administrative staff, only those (N = 65), who showed an average of at least 8 hours of sitting time on the first self-report in the working day. Through education in October and November 2018, we invited the subjects to volunteer for one month to participate in the project "reducing sitting time. Only 37 reduced the total daily sitting time by up to two hours. The disadvantage of the "sitting down" project is the short duration of time and self-reporting. Despite the limitations, all the researchers show that sedentary behaviour is a severe problem in Slovenia as well. Sedentary work time is difficult to reduce, in addition to increasing physical activities, it is important to reduce sitting hours.

Keywords: sedentary behaviour, reducing sedentary, strategies, public health

RT - 5

ZDRAVO STARENJE I RADNA TERAPIJA

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Sažetak: WHO (Svjetska zdravstvena organizacija) definira zdravo starenje kao "proces razvoja i održavanja funkcionalne sposobnosti koja omogućuje dobrobit u starijoj dobi". Aktivno starenje, promatrano iz perspektive sudjelovanja u okupacijama promiče zadovoljstvo životom i osobno blagostanje. Narušavanje tjelesnog i mentalnog zdravlja, gubitak funkcionalnih sposobnosti te slabljenje obiteljskih i društvenih veza predstavljaju značajnu prepreku aktivnom starenju. RT (radna terapija) educira klijente kako spriječiti ili kontrolirati dugoročne i štetne efekte prevladavajuće opasnosti po zdravlje i blagostanje. Uravnotežena prehrana, tjelovježba, smanjenje stresa, i okolišne prilagodbe za sigurnost neki su od primjera koji mogu osigurati dugoročne promijene u zdravstvenom statusu. Bez obzira na godine, nezdrave navike i obrasci življenja mogu se mijenjati. Faktori životnog stila koji imaju mogućnost kontrole imaju važnu ulogu u omogućavanju zdravog i zadovoljavajućeg života u starijim godinama. Poticanje osoba starije životne dobi da aktivno sudjeluju u preuzimanju odgovornosti za unaprjeđenje vlastitog zdravlja i kvalitete života je imperativ. Primarni cilj promocije zdravlja treba biti fokusiran na prevenciju napredovanja bolesti i rizika od invaliditeta i smrti, te dizajniran da pomogne starijim osobama održati funkcionalnu neovisnost i autonomiju što je duže moguće. Radno terapijske strategije promocije zdravlja uključuju redizajn životnog stila i podršku sudjelovanju u okupacijama kao sredstvu prevencije „bolesnog" starenja. Ključno je demonstriranje važnosti povećanja zdravstvene dobrobiti kod povratka izvođenju svrsishodnih aktivnosti. Edukacija osoba starije životne dobi o vodećim uzrocima funkcionalne ograničenosti, onesposobljenja i smrti, facilitira potencijal za promjenu ponašanja i poboljšanje kvalitete života. Radni terapeuti promoviraju osobnu odgovornost osoba starije životne dobi za vlastito zdravlje kroz facilitaciju aktivnosti koje mogu probuditi interes i sudjelovanje u svrsishodnim aktivnostima. Vjerovanje da svaka mala adaptirana promjena može poboljšati kvalitetu života pojedinca bez obzira na njegovu starost je koncept kojeg je neophodno poticati.

Ključne riječi: zdravo starenje, radna terapija, promocija zdravlja, osobe starije životne dobi

HEALTHY AGING AND OCCUPATIONAL THERAPY

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Abstract: WHO (World Health Organization) defines healthy aging as "the process of developing and maintaining functional ability that enables well-being in old age". Active aging, viewed from the perspective of participation in occupations, promotes life satisfaction and personal well-being. Impairment of physical and mental health, loss of functional abilities and weakening of family and social ties represent a significant obstacle to active aging. OT (occupational therapy) ducates clients on how to prevent or control the long-term and adverse effects of prevalent hazards to health and well-being. A balanced diet, exercise, stress reduction, and environmental adaptations for safety are some examples that can provide long-term changes in health status. Regardless of age, unhealthy habits and lifestyle patterns can be changed. Controllable lifestyle factors play an important role in enabling a healthy and satisfying life in older age. Encouraging older people to actively participate in taking responsibility for improving their own health and quality of life is imperative. The primary goal of health promotion should be focused on preventing disease progression and the risk of disability and death, and designed to help older people maintain functional independence and autonomy for as long as possible. Occupational therapy health promotion strategies include lifestyle redesign and support for participation in occupations as a means of preventing "sick" aging. Demonstrating the importance of increasing health well-being when returning to performing purposeful activities is key. Education of the elderly about the leading causes of functional limitation, disability and death facilitates the potential for behavior change and improvement of quality of life. Occupational therapists promote the personal responsibility of the elderly for their own health through the facilitation of activities that can arouse interest and participation in purposeful activities. The belief that every small adapted change can improve the quality of life of an individual, regardless of their age, is a concept that must be encouraged.

Key words: healthy aging, occupational therapy, health promotion, elderly people

RT - 6

STRAH OD PADA KAO FAKTOR RIZIKA ZA PAD KOD STARIJE POPULACIJE

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Sažetak: Padovi predstavljaju najčešći događaj u populaciji starih osoba i imaju poseban javno-zdravstveni značaj. Strah od pada jedna je od najvećih briga starijih ljudi i ne treba ga podcjenjivati. To je unutrašnji psihološki fenomen zabrinutosti ili anksioznosti zbog pada. Opisan je i kao uzrok i kao posljedica padova. Cilj istraživanja je ispitati uticaj različitih faktora na pojavu straha od pada kao faktora rizika za pad kod starije populacije. Prospektivna studija je obuhvatila 60 ispitanika oba pola starijih od 65 godina koji nisu doživjeli pad, podijeljenih u dvije grupe na osnovu vrijednosti indeksa tjelesne mase (BMI). Za potrebe istraživanje korišten je sociodemografski upitnik, indeks tjelesne mase (BMI) i FES-I (Falls Efficacy Scale – International). Za analizu dobijenih podataka korištena je deskriptivna statistika i χ^2 test. Unutar obje grupe, imenuju se iste aktivnosti prilikom čijeg izvođenja se javlja strah od pada. χ^2test nije pokazao statistički značajnu vezu između pola ispitanika i straha od pada mjerenog testom FES-I, kako kod ispitanika tjelesne mase BMI<25; χ^2 (2,30)=0.010,Sig.=0.995,CramersV=0.019, tako i kod ispitanika sa indeksom BMI>=25; χ^2 (2,30)=1.158, Sig.=0.561,CramersV.=0.196. Takođe, u ovom uzorku nije utvrđeno, da postoji veza statusa življenja (sami ili sa porodicom) sa stepenom straha od pada ocijenjenog testom FES-I; χ^2 (2,30)=3.684, Sig.=0.159, CramersV.=0.350, kako kod ispitanika sa indeksom tjelesne mase BMI<25,tako i u grupi ispitanika sa indeksom tjelesne mase BMI>=25; χ^2 (2,30)=0.557, Sig.=0.757, CramersV. =0.136. Potrebno je dodatno istražiti koji faktori dovode do pojave straha od pada kod osoba koje ga ranije nisu doživjele.

Ključne riječi: padovi, strah od pada, FESI-I

FEAR OF FALLING AS A RISK FACTOR FOR FALLS IN THE ELDERLY POPULATION

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Abstract: Falls are the most common event in the elderly population and have a special significance in public health. Fear of falling is one of the biggest concerns of older people and should not be underestimated. It is an internal psychological phenomenon of concern or anxiety about falling. It has been described as both a cause and a consequence of falls. The aim of the research is to examine the influence of various factors on the occurrence of fear of falling as a risk factor for falling in the elderly population. The prospective study included 60 subjects of both sexes over the age of 65 who did not fall previously, divided into two groups based on body mass index (BMI). For research purposes, we used a sociodemographic questionnaire, body mass index (BMI) and FES-I (Falls Efficacy Scale – International). Descriptive statistics and the χ^2 test were used to analyze the obtained data. The fear of falling appears in the same activities within both groups The χ^2 test did not show a statistically significant relation between the gender of the subjects and the fear of falling measured by the FES-I test, neither in respondents with BMI<25; χ^2 (2,30)=0.010, Sig.=0.995, CramersV=0.019, nor in respondents with BMI>=25; χ^2 (2,30)=1.158, Sig.=0.561, CramersV.=0.196. Also, in this sample, relation between living status (alone or with family) and the degree of fear of falling assessed by the FES-I test was not established; χ^2 (2,30)=3.684, Sig.=0.159, CramersV.=0.350, both in respondents with BMI<25 and in respondents with BMI>=25; χ^2 (2,30)=0.557, Sig.=0.757, CramersV. =0.136. It is necessary to further investigate which factors lead to the appearance of fear of falling in people who have not experienced it before.

Keywords: falls, fear of falling, FESI-I

RT - 7

RADNA TERAPIJA DJECE SA PARALIZOM PLEXUS BRACHIALISA

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Sažetak: Zadatak radne terapije djece sa paralizom plexsus brachijalisa je poticanje i razvijanje funkcionalnih sposobnosti za što aktivnije i nezavisnije učestvovanje u svakodnevnim životnim aktivnostima koje trebaju biti primjerene njihovom uzrastu, potrebama i željama. Cilj istraživanja je prikazati uticaj radne terapije u procesu osposobljavanja djece sa paralizom plexsus brachijalisa. Ispitanici i metode case study je provedena na uzorku od 2 ispitanika (PS1 i PS2) s dijagnozom paralizom plexsus brachijalisa nastale kao posljedica porođajne traume. Ispitanik PS1 ima lakši oblik oštećenja, starosti mjesec i po, a ispitanik PS2 oštećenje srednje do teškog oblika, starosti tri mjeseca. Kod oba ispitanika primijenjen je razvojni pristup, metod strukturiranog posmatranja, intervju sa majkom. Terapijski postupci su provedeni kroz individualni program radne terapije sa elementima Bobath koncepta koji je obuhvatao obuku majke stimulativnim postupcima brige i njege djeteta, stimulaciju funkcionalnih kapaciteta zahvaćenog ekstremiteta, poticanje i razvijanje funkcionalnih sposobnosti potrebnih za izvođenje svakodnevnih životnih aktivnosti, pozicioniranje i izrada korektivne ortoze. Rezultati su pokazali napredak kod oba ispitanika. PS1 u prvom trimestu je ispunio više od očekivanja, nego PS2. Na stimulaciju sprovedenu kroz položaje PS1 daje bolji odgovor nego PS2. Prilikom samog pozicioniranja kroz sve posturalne položaje PS1 je više podržavao i zadržavao fiziološki položaj, dok PS2 ne zadržava fiziološki položaj i dominira izražena volarna fleksija šake. Oba ispitanika su dala adekvatan odgovor i prihvatanje korektivne udlage. Rezultati ukazuju da, bez obzira na uzrast, kliničku sliku, stepen oštećenja, holističkim pristupom i kontinuiranim radom sa roditeljima i djecom sa paralizom plexsus brachialisa se može djelovati na razvijanje djetetovih funkcionalnih sposobnosti i optimalnog funkcioniranja u aktivnostima dnevnog života.

Ključne riječi: paraliza plexsus brachialisa, radna terapija, timski rad, aktivnosti svakodnevnog života

OCCUPATIONAL THERAPY OF CHILDREN WITH PLEXUS BRACHIALIS PARALYSIS

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Abstract: The task of occupational therapy for children with brachial plexus paralysis is to encourage and develop functional abilities for active and independent participation in daily life activities that should be appropriate for their age, needs and wishes. The goal of the research is to show the impact of occupational therapy in the process of training children with brachial plexus paralysis. Subjects and methods- The case study was conducted on a sample of 2 subjects (PS1 and PS2) diagnosed with brachial plexus paralysis as a result of childbirth trauma. The subject PS1 has a mild form of injury, 1 and a half months old, and subject PS2 has a more severe form of injury, aged three months. For both respondents, the following was applied: a developmental approach, the method of structured observation and an interview with the mother.Therapeutic procedures were carried out through an individual program of occupational therapy with elements of the Bobath concept, which included training the mother in stimulating child care procedures, stimulating the functional capacities of the affected limb, encouraging and developing the functional abilities needed to perform daily life activities, positioning and making corrective orthoses. The results showed improvement in both subjects. In the first trimester, PS1 met more expectations than PS2. PS1 gave a better response than PS2 to the stimulation carried out through the positions. During positioning itself through all postural positions, PS1 more supported and maintained the physiological position, while PS2 did not maintain the physiological position and pronounced volar flexion of the hand dominated. Both subjects gave an adequate answer and accepted the corrective splint. The results indicate that, regardless of age, clinical picture, degree of damage, a holistic approach and continuous work with parents and children with brachial plexus paralysis can help develop the child's functional abilities and optimal functioning in daily life activities.

Key words: brachial plexus paralysis, occupational therapy, teamwork, activities of daily life

RT - 8

STAVOVI STUDENATA PRVE GODINE STUDIJSKOG PROGRAMA STRUKOVNI RADNI TERAPEUT O OSOBAMA SA INVALIDITETOM

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Sažetak: Cilj rada je prikaz stavova prema osobama sa invaliditetom budućih radnih terapeuta. Studenti prve godine studijskog programa strukovni radni terapeut odseka Visoka zdravstvena škola, Akademije strukovnih studija Beograd (AASB), ispitivani su korišćenjem dva upitnika: Toronto Empathy Questionnaire (TEQ) (Spreng, 2009) i Attitudes Towards Disabled Persons Scale (ATDP) form 0 (Yuker, Block and Young, 1970). Istraživanje je sprovedeno u letnjem semestru školske 2022/23. godine uz odobrenje Komisije za etički odbor ASSB. Pretpostavka je da će studenti koji su se opredelili za zdravstvenu profesiju pokazati i na početku školovanja visok stepen empatije za osobe sa različitim oblicima invaliditeta.

Ključne reči: stavovi, studenti, osobe sa invaliditetom

ATTITUDES OF STUDENTS IN THE FIRST YEAR OF STUDY FOR THE PROFESSIONAL OCCUPATIONAL THERAPIST ABOUT PEOPLE WITH DISABILITIES

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Abstract: Aim of this paper is to present the attitudes of future occupational therapists towards persons with disabilities. First-year students at Academy of Applied Studies in Belgrade (AASB), Department High Health College, study group Professional Occupational Therapists were examined using four questionnaires: Toronto Empathy Questionnaire (TEQ) (Spreng, 2009), and Attitudes Towards Disabled Persons Scale (ATDP) form B (Yuker, Block and Young, 1970). The research was conducted in the summer semester 2022/23. with the approval of the ASSB Ethics Committee. The assumption is that students who have opted for a health profession will show a high degree of empathy for people with different forms of disability even at the beginning of their education.

Keywords: attitudes, students, persons with disabilities

RT - 9

UNAPREĐENJE KVALITETA USLUGA OKUPACIONE TERAPIJE U CENTRIMA ZA MENTALNO ZDRAVLJE U REPUBLICI SRPSKOJ

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Sažetak: Aktivnostima Projekta mentalnog zdravlja u BiH usluge okupacione terapije postale su dostupne korisnicima kroz mrežu Centara za mentalno zdravlje. Tokom posljednjih 5-6 godina težište aktivnosti bilo je usmjereno na edukaciju osoblja i stvaranje tehničkih uslova za pružanje usluga. Kroz vlastito iskustvo, stečeno tokom supervizijskih i ocjenjivačkih posjeta Centrima za mentalno zdravlje u Republici Srpskoj, uočeno je da: ASKVA-a nema definisane standarde sigurnosti i kvaliteta za oblast okupacione terapije, da se na terenu dosljedno ne poštuje proces okupacione terapije i praćenje ishoda. Cilj rada je ukazati na postojanje ovih problema i moguće aktivnosti u pravcu njihovog prevazilaženja.

Ključne riječi: kvalitet, mentalno zdravlje, okupaciona terapija

IMPROVING THE QUALITY OF OCCUPATIONAL THERAPY SERVICES IN MENTAL HEALTH CENTERS IN THE REPUBLIC OF SRPSKA

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Abstract: Through the activities of the Mental Health Project in Bosnia and Herzegovina, occupational therapy services became available to users through the network of Mental Health Centers. During the last 5-6 years, the focus of activity was on staff education and creation of technical conditions for service provision. Through my own experience, gained during supervisory and evaluation visits to Mental Health Centers in the Republic of Srpska, it is noticed that: ASKVA does not have defined safety and quality standards for the field of occupational therapy, that the process of occupational therapy and outcome monitoring are not consistently respected in the field. The aim of the work is to point out the existence of these problems and possible activities in the direction of overcoming them.
Key words: quality, mental health, occupational therapy

RT – 10

RADNA TERAPIJA I PERINATALNO MENTALNO ZDRAVLJE

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Sažetak: Perinatalni mentalni period se odnosi na mentalno zdravlje roditelja od trenutka kada je beba začeta do navršene dvije godine života djeteta. Kada mentalno zdravlje roditelja tokom ovog perioda nije dobro, to može negativno uticati na privrženost i vezu između roditelja i djeteta, što posljedično može uticati na djetetovo mentalno, fizičko i emocionalno ponašanje u toku njegovog života. Radna terapija ima za cilj da smanji ove rizike podržavajući mentalno zdravlje roditelja tokom ovog perioda, kroz jednu od ključnih vještina profesije: healing by doing. Da bi raspravljali o savremenoj prirodi i važnosti radne terapije u perinatalnoj praksi mentalnog zdravlja, urađen je integrativni pregled literature koji je uključivao radove iz časopisa identifikovani pretraživanjem baze podataka, statističke podatke Ujedinjenog Kraljevstva, vladine politike i smjernice i sivu literaturu. Perinatalno mentalno zdravlje je savremeno pitanje jer se mnogi roditelji bore sa svojim mentalnim zdravljem i došlo je do povećanja smrtnosti majki. Radni terapeuti mogu koristiti profesionalne intervencije kao što su ko-okupacije kako bi se uključili u zajedničke okupacije koje promovišu vezivanje i privrženost. Da bi bili relevantni i savremeni, radni terapeut treba da 1. Zagovaraju profesionalnu ulogu radnih terapeuta u perinatalnom mentalnom zdravlju. 2. Povećaju istraživanja o radnoterapijskim procjenama, intervencijama i mjerama ishoda, kako bi se formirala baza za praksu zasnovanu na dokazima. 3. Usvoje više različitih pristupa u praksi uključujući perinatalni okvir uma, adekvatnu brigu o onima koji su doživjeli traumu i antirasistički pristup. Radni terapeuti mogu podržati mentalno zdravlje oba roditelja i njihovog djeteta/djece tokom perinatalnog perioda kroz ko-okupacije.

Ključne riječi: perinatalno, mentalno zdravlje, ko-okupacija, radna terapija, savremeni

OCCUPATIONAL THERAPY AND PERINATAL MENTAL HEALTH

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Abstract : The perinatal mental period refers to a parents mental health from when a baby is conceived up until the child reaches two years of age. When a parent is mentally unwell during this period it can negatively impact on the attachment and bonding between both parent and child which consequently can impact on a child's mental, physical, emotional behavioural wellbeing across their life course. Occupational Therapy aims to reduce these risks by supporting parental mental health during this period, through one the professions key skills: healing by doing. To debate the contemporary nature and relevance of occupational therapy in perinatal mental health practice. An integrative literature review was completed that included journal articles identified through database searches, UK statistical data, government policies and guidelines and grey literature. Perinatal Mental Health is a contemporary issue because many parents struggle with their mental health and there has been an increase in maternal deaths. Occupational Therapists can utilise occupational interventions such as co-occupations to engage in joint occupations that promote bonding and attachment. To be relevant and contemporary Occupational Therapist's need to 1. Advocate for our professional role in Perinatal Mental Health. 2. Increase research into Occupational Therapy assessments, interventions and outcome measures to inform the evidence base for practice. 3. Adopt multiple lenses in practice including a perinatal frame of mind, trauma-informed care and an anti-racist approach. Occupational Therapists can support the mental health of both parents and their child/children during the perinatal period through co-occupations.

Key words: Perinatal, Mental Health, Co-occupation, Occupational Therapy, Contemporary

RT - 11

OSNAŽIVANJE PREDAVAČA ZA IZAZOVE RADNOG MJESTA

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Sažetak: Osnaživanje je proces koji omogućava svakom članu edukacijskog tima sudjelovanje u aktivnostima podučavanja studenata na autonoman i neovisan način. Hibridni model podučavanja zahtijeva od predavača-nastavnika dodatna znanja i prilagodbu. Rukovodstvo znanstveno nastavnih ustanova često nameću nastavne obaveze vezano uz ispunjavanje nastavne norme što kod nekih nastavnika dovodi do izgaranja na radnom mjestu. Sindrom burnout ili sindrom izgaranja na poslu označava progresivni gubitak idealizma, energije i smislenosti vlastitog rada kao posljedice frustracije i stresa na radnom mjestu. Izgaranje na poslu slično je sindromu kroničnog umora, ali pritom se mijenja i stav prema poslu, što za umor nije karakteristično. Rad prikazuje glavne razlike između izgaranja na poslu i umora. Interaktivna radionica ima za cilj podučiti sudionike o važnosti povezivanja emocionalne kognitivne i tjelesne razine kao prediktora očuvanja mentalnog zdravlja na radnom mjestu i izazovima kojima je svaki sudionik nastavnog procesa izložen u radu sa studentima.

Ključne riječi: predavači, radno mjesto, izgaranje

EMPOWERMENT OF LECTURERS FOR WORKPLACE CHALLENGES

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Abstract: Empowerment is a process that enables each member of the educational team to participate in the activities of teaching students in autonomous and independent ways. The hybrid model of teaching requires additional knowledge and adaptation from the lecturer-teacher. The leadership of scientific educational institutions often impose teaching duties related to meeting the teaching norm, which leads to burnout in the workplace for some teachers. Burnout syndrome at work means a progressive loss of idealism, energy and meaningfulness of one's own work as a result of frustration and stress at the workplace. Burnout at work is similar to chronic fatigue syndrome, but the attitude towards work also changes, which is not characteristic of fatigue. This article shows the main differences between job burnout and fatigue. The interactive workshop aims to teach participants about the importance of connecting emotional, cognitive, and physical levels as a predictor of maintaining mental health in the workplace and the challenges that every participant in the teaching process is exposed to when working with students.

Key words: lecturers, workplace, burnout

RT – 12

KOMPETENCIJE NASTAVNIKA RAZREDNE NASTAVE ZA INKLUZIVNO OBRAZOVANJE

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Sažetak: Inkluzija predstavlja pristup u kojem se naglašava da je različitost u snazi, sposobnostima poželjna i prirodna. Pod inkluzijom se ne podrazumeva izjednačavanje dece, već uvažavanje različitosti svakog deteta i menjanje škole, i šire sredine uz poštovanje individualnih različitosti i potreba. Pod kompetencijama nastavnika za inkluzivno obrazovanje podrazumevaju se znanja i veštine za rad sa decom sa smetnjama u razvoju, i pozitivni stavovi koji podržavaju razvoj svih učenika. Cilj rada je prikazivanje kompetencija nastavnika razredne nastave za inkluzivno obrazovanje. Kroz rad su analizirane kompetencije nastavnika neophodne za kvalitetan rad sa djecom sa smetnjama u razvoju u mlađim razredima osnovne škole. Riječ je o poznavanju osnovnih znanja i vještina neophodnih za rad sa djecom sa smetnjama u razvoju; poznavanju različitih strategija podučavanja i kreativnosti; motivisanosti za rad; pozitivnom stavu i profesionalnom usavršavanju; poznavanju i njegovanju timskog rada i empatičnosti. Navedene kompetencije pružaju doprinos kvalitetnom radu sa učenicima sa smetnjama u razvoju, sa jedne strane, i razvoju njihovih kompetencija, sa druge strane.

Ključne riječi: kompetencije, učitelj, deca sa smetnjama u razvoju, inkluzija, obrazovanje

COMPETENCIES FOR INCLUSIVE EDUCATION OF CLASS TEACHERS

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Abstract: Inclusion is an approach that emphasizes that diversity in strength, abilities is desirable and natural. Inclusion does not mean equalizing children, but respecting the diversity of each child and changing the school, and the wider environment, while respecting individual differences and needs. The competencies of teachers for inclusive education include knowledge and skills for working with children with disabilities and positive attitudes that support the development of all students. The aim of this paper is to present the competencies of primary school teachers for inclusive education. The work analyzes the competencies of teachers necessary for quality work with children with disabilities in the younger grades of primary school. It is about knowing the basic knowledge and skills necessary to work with children with disabilities; knowledge of different teaching strategies and creativity; work motivation; a positive attitude and professional development; knowing and nurturing teamwork and empathy. These competencies contribute to the quality of work with students with disabilities, on the one hand, and the development of their competencies, on the other hand.

Keywords: competencies, teacher, children with disabilities, inclusion, education

RT-13

PORODICE SA DECOM SA SMETNJAMA U RAZVOJU – KAKO DO OPTIMALNOG KVALITETA ŽIVOTA?

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Sažetak: Kvalitet porodičnog života naglašava značaj partnerskog odnosa između porodice i stručnjaka u postavljanju prioriteta i ostvarivanju zajedničkih ciljeva. S jedne strane unapređivanje kvaliteta života osoba sa smetnjama u razvoju jeste ishod kojim se teži u individualnom radu, dok s druge strane kvalitet porodičnog života predstavlja pokazatelj uticaja širokog spektra usluga usmerenih na porodicu. Stoga, praćenje promena kvaliteta porodičnog života i njegovog poboljšanja daje osnovu za unapređivanje različitih modela usluga. Cilj istraživanja je bio da se utvrdi nivo kvaliteta života roditelja dece sa smetnjama u razvoju i istaknu faktori koji pozitivno i/ili negativno utiču na kvalitet života. Nezavisne varijable ovog istraživanja bile su: podrška šire porodice i institucionalna podrška, pol, bračni status i zaposlenost roditelja. Uzorak je činilo 100 ispitanika - roditelja dece sa smetnjama u razvoju. Za prikupljanje podataka korišćena je skala za procenu kvaliteta života (World Health Oragization Quality of Life - BREF). Pitanja u skali se odnose na globalnu procenu kvaliteta života i zadovoljstva zdravljem i četiri domena koja mere: *fizičko zdravlje, psihičko zdravlje, društvene odnose i okruženje.* Rezultati su pokazali postojanje povezanosti između podrške od strane šire porodice i prijatelja i podrške od strane institucija i kvaliteta života roditelja kroz četiri navedena domena. Takođe utvrđeno je da postoje statistički značajne razlike u kvalitetu života u domenu *društveni odnosi* između roditelja koji su u braku i onih koji nisu, kao i postojanje statistički značajnih razlika u pogledu kvaliteta života u domenu *okruženje* između roditelja različitog bračnog statusa, kao i u slučaju društvenih odnosa.

Ključne reči: kvalitet života, porodica, fizičko i psihičko zdravlje, okruženje i socijalni odnosi, dete sa smetnjama u razvoju

FAMILIES WITH CHILDREN WITH DISABILITIES - HOW TO ACHIEVE OPTIMAL QUALITY OF LIFE?

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Abstract: The quality of family life emphasizes the importance of partnership between family and professionals in setting priorities and achieving common goals. On the one hand, improving the quality of life of people with developmental disabilities is the outcome sought in individual work, while on the other hand, the quality of family life is an indicator of the impact of a wide range of family-oriented services. Therefore, monitoring the changes in the quality of family life and its improvement provides the basis for the improvement of different service models. The goal of the research was to determine the level of quality of life of parents of children with developmental disabilities, to highlight the factors that positively and/or negatively affect the quality of life. The independent variables of this research were: extended family support and institutional support, gender, marital status and parental employment. The sample consisted of 100 respondents - parents of children with developmental disabilities. The World Health Organization Quality of Life (BREF) scale was used to collect data. The questions in the scale refer to a global assessment of quality of life and health satisfaction and the four domains they measure: physical health, psychological health, social relationships and environment. The results showed the existence of a connection between support from extended family and friends and support from institutions and the quality of life of parents through the four mentioned domains. It was also determined that there are statistically significant differences in the quality of life in the domain of social relations between parents who are married and those who are not, as well as the existence of statistically significant differences in the quality of life in the domain of the environment between parents of different marital status, as well as in the case of social relations.

Key words: quality of life, family, physical and mental health, environment and social relations, child with developmental disabilities

SANITARNO INŽENJERSTVO

SANITARY ENGINEERING

SI - 1

MIKROBIOLOŠKI KVALITET I NAJČEŠĆI KONTAMINANTI HRANE

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Sažetak: Imajući u vidu značaj mikrobiološke ispravnosti hrane sa aspekta zdravstvene bezbjednosti i najčešće uzročnike kontaminacije hrane (bakterije) – izazivače alimentarnih intoksikacija i toksoinfekcija kod ljudi, bilo da se pojavljuju sporadično ili epidemijski, cilj ovog rada je analiza i sublimacija najčešćih bakterijskih vrsta izolovanih iz kontaminirane hrane i bioloških uzoraka osoba sa alimentarnom intoksikacijom ili toksoinfekcijom. Posmatrano na globalnom nivou i zasnovano prvenstveno na slučajevima prijavljenih od strane Evropskog Centra za kontrolu i prevenciju bolesti (ECDC) i Svjetske zdravstvene organizacije (SZO) u toku 2022. godine, registrovan je trend porasta epidemija uzrokovanih mikrobiološki kontaminiranom hranom. Najnoviji podaci američke Uprave za hranu i ljekove (FDA) i ECDC prikazuju epidemije uzrokovane sa *Salmonella typhimurium*, *Escherichia coli*, *Yersinia* spp. i *Campylobacter* spp., koje su u porastu u odnosu na 2021. godinu. Najveća stopa prijavljivanja bila je među malom djecom uzrasta od 0 do 4 godine. Najčešći uzročnici su *S. enteritidis* i *S. typhimurium*, tako da je u 30 zemalja prijavljeno 61.236 slučajeva salmoneloze, što je za 14% više u odnosu na 2020. godinu (53.163 slučaja). Ukupno 6.534 potvrđenih slučajeva infekcije *E. coli* koje proizvode Shiga toksin bilo je u 2021. godini u poređenju sa 4.824 u 2020. godini. Slično je i sa *Yersinia* spp., najčešće *Y. enterocolitica*, u 2021. godini prijavljeno je 6.876 slučajeva jersinioze u poređenju sa 5.747 u 2020. godini, a evidentirani su i smrtni slučajevi. Zaključak je da su jaja i proizvodi od jaja i dalje najrizičnija hrana u epidemijama, ali je nekoliko velikih incidenata povezano sa kontaminiranim povrćem (posebno zelena salata), voćem i sjemenom susama. Da bi se dokazala genetska povezanost, tj. da su bakterije kod različitih oboljelih osoba istog porijekla, neophodno je sekvenciranje cijelog genoma. U suzbijanju epidemija od posebnog su značaja uslovi skladištenja i čuvanja namirnica, pranje salata, rukovanje-pranje, čišćenje i dezinfekcija u prostorijama za pripremu hrane i distribucija.

Ključne riječi: bezbjednost hrane, bakterijska kontaminacija, alimentarne intoksikacije, toksoinfekcije

MICROBIOLOGICAL QUALITY AND THE MOST COMMON FOOD CONTAMINANTS

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Abstract: Considering the importance of the microbiological correctness of food from the aspect of health safety and the most common causes of food contamination (bacteria) – the causes of alimentary intoxications and toxoinfections in humans, whether sporadic or epidemic, this work aims to analyze and sublimate the most common bacterial species isolated from contaminated food and biological samples of individuals with alimentary intoxication or toxoinfection. At the global level and especially based on the cases reported by the European Center for Disease Control and Prevention (ECDC) and the World Health Organization (WHO) for 2022, a trend of increasing epidemics caused by microbiologically contaminated food has been observed. The latest data from the U.S. Food and Drug Administration (FDA) and ECDC show that epidemics caused by *Salmonella typhimurium*, *Escherichia coli*, *Yersinia* spp., and *Campylobacter* spp. are increasing compared with 2021. The highest reporting rate was among young children aged 0 to 4 years. The most common pathogens are *S. enteritidis* and *S. typhimurium*, resulting in 61,236 cases of salmonellosis reported in 30 countries, 14% more than in 2020 (53,163 cases). In 2021, there were 6,534 cases of Shiga toxin-producing *E. coli* infection compared with 4,824 in 2020. Similarly, *Yersinia* spp. and most commonly *Y. enterocolitica* caused 6,876 cases of yersiniosis in 2021 compared with 5,747 in 2020, and also deaths. The conclusion is that eggs and egg products remain the most dangerous foods in epidemics, but several major incidents have been linked to contaminated vegetables (especially lettuce), fruits, and sesame seeds. To prove the genetic link, i.e., that the bacteria have the same origin in different sick individuals, the entire genome must be sequenced. In the suppressing epidemics, food storage and preservation conditions, lettuce washing, handling-washing, cleaning and disinfection in food preparation areas, and distribution are of particular importance.

Keywords: food safety, bacterial contamination, alimentary intoxications, toxoinfections

SI - 2

UZORKOVANJE BRISOM SA POVRŠINA I OPORAVAK *ESCHERICHIA COLI*

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Sažetak: Površine koje dolaze u kontakt sa hranom mogu biti izvor kontaminacije mikroorganizmima tokom proizvodnje, prerade, pakovanja i serviranja hrane. Značaj i posljedice kontaminacije procjenjuju se na osnovu broja prisutnih mikroorganizama ili otkrivanja patogenih mikroorganizama. U ovoj studiji provedena je vještačka kontaminacija površine aluminijumske folije koja se koristi u domaćinstvu. Za kontaminaciju je pripremljena prekonoćna suspenzija *Escherichia coli* ATCC 8739 u tripton soja bujonu (TSB). Sa veštački kontaminirane površine 10 x 10 cm^2 uzorkovane su dve manje površine pomoću dva zasebna bris štapića. Prvo je uzorkovano jednim brisom koristeći okvir od nerđajućeg čelika (4 cm x 5 cm) za određivanje ukupnog broja aerobnih mikroorganizma. Drugi bris je korišćen za uzorkovanje sa druge kontaminirane površine od 20 cm^2 i određivanje broja *Enterobacteriaceae*. Podloga za ukupan broj (PCA) je korišćena za određivanje ukupnog broja mikroorganizama, a ljubičasto crveni laktoza žučni agar (VRBGA) je korišćen za određivanje *Enterobacteriaceae.* Inkubacija petri šolja je bila na 30 ^oC. Ovaj proces je ponovljen na 16 kontaminiranih površina. Na osnovu poređenja sa procjenjenim brojem *Escherichia coli* u suspenziji za kontaminaciju, oporavak *Escherichia coli* nakon uzorkovanja brisom bio je manji od 60% kako za PCA tako i za VRBGA. Na osnovu dobijenih rezultata, u radu se razmatra eksperimentalni dizajn i efektivnost uzorkovanja brisom sa površina koje dolaze u kontakt sa hranom.

Ključne riječi: bris, *Escherichia coli,* površine koje dolaze u konakt sa hranom

SURFACE SWAB SAMPLING AND RECOVERY OF *ESCHERICHIA COLI*

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Abstract: The surface that comes into contact with food can be a source of contamination by microorganisms during the production, processing, packaging, and serving of food. The importance and consequences of contamination can be assessed based on the number of microorganisms present or the detection of pathogenic microorganisms. This study was performed on artificial surface contamination of household aluminum foil. For contamination, an overnight suspension of *Escherichia coli* ATCC 8739 was prepared in Tryptone soy broth. From artificially soiled surfaces measuring 10x10 cm^2, two smaller surface areas were sampled with separated swabs. The first was sampled one swab using a small stainless steel frame (4 cm x 5 cm) for estimation of the total count of aerobic microorganisms. A second swab was used for sampling from another contaminated surface of 20 cm^2 for estimation of the number of *Enterobacteriaceae.* Plate count agar (PCA) and Violet red bile glucose agar (VRBGA) were used for a total count of microorganisms and *Enterobacteriaceae,* respectively. Petri dishes were incubated at a temperature of 30 ^oC. The process was repeated on 16 contaminated surfaces. Compared to the estimated number of *Escherichia coli* in soiling suspension the recovery of swabbing was less than 60% for the count *Escherichia coli* on PCA as well as on VRBGA. This finding indicates the effectiveness of swab sampling and that findings of the presence of microorganisms on surfaces that come into contact with food require special attention.

Key words: *Escherichia coli,* surfaces that come into contact with food, swab

SI - 3

ANTIBAKTERIJSKA AKTIVNOST *Allium ursinum* L.

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Sažetak: *Allium ursinum* L. je u narodu poznatiji kao sremuš, crijemuš, divlji ili medvjeđi luk. U ishrani se koristi kao povrće (salata i začin), a u humanoj medicini kao pomoćno sredstvo. Značajan je zbog svoje nutritivne i ljekovite vrijednosti. Pošto se u ishrani najvećim dijelom koristi sezonski u vrijeme prispjeća i u svježem stanju, kao salata, može da bude značajan izvor pojedinih hranljivih materija, mineralnih materija, koje su od velikog značaja za zdravlje ljudi. Otpornost bakterija na antimikrobne supstance (antibiotike i hemoterapeutike) jedan je od najznačajnijih problema u javnom zdravstvu. Problem antimikrobne rezistencije se veže uz patogene bakterije i uzročnike zoonoza, ali ta otpornost opterećuje i apatogene bakterije koje prenose gene rezistencije kroz prehrambeni lanac. Cilj ovoga rada je da se ispita antimikrobna aktivnost *Allium ursinum* L. na rast apatogenih bakterija izolovanih iz hrane životinjskog porijekla i da se odredi tip djelovanja na ispitivane izolate. Biljni materijal korišten u ovom radu je svježi list *Allium ursinum* L. ubran na padinama planine Kruševo Brdo, opština Kotor Varoš, Republika Srpska, Bosna i Hercegovina. Listovi sremuša su usitnjeni, dodato je suncokretovo ulje, te je gusta masa sremuša razrijeđena destilovanom vodom u omjeru sremuš:voda 80:20%. Za ispitivanje antibakterijske aktivnosti korišćena je agar difuziona metoda. Antibakterijska aktivnost je ispitana na 10 bakterijskih sojeva koagulaza negativnih stafilokoka izolovanih iz hrane životinjskog porijekla, iz kolekcije Laboratorije za mikrobiologiju hrane, hrane za životinje i vodu Javne ustanove Veterinarski institut Republike Srpske "Dr Vaso Butozan" Banja Luka. Rezultati analiza ukazuju na dobra inhibitorna svojstva *Allium ursinum* L. na 8 od 10 testiranih apatogenih bakterija sa zonom inhibicije od 9,67mm do 45,00mm. Baktericidno djelovanje je potvrđeno kod četiri izolata u sva tri ponavljanja, a bakteriostatsko kod dva izolata. Imajući u vidu da doprinos apatogene mikrofore iz hrane životinjskog porijekla u prenosu antimikrobne rezistencije kroz prehrambeni lanac nije u potpunosti poznat, te da dobijeni rezultati ukazuju da list *Allium ursinum* L. ima dobra antibakterijska svojstva, buduće studije je potrebno usmjeriti ka ispitivanju većeg broja bakterija.

Ključne riječi: *Allium ursinum* L., apatogene bakterije, antibakterijska aktivnost, rezistencija

ANTIBACTERIAL ACTIVITY OF *Allium ursinum* L.

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Abstract: *Allium ursinum* L. is populary known as sremush, crijemush, wild or bear onion. It is used in the diet as a vegetable (salad and spice) and in human medicine as an aid. It is important for its nutritional and medicinal value. Since it is mostly used in the diet seasonally at the time of arrival and in a fresh state, as a salad, it can be a significant source of certain nutrients, minerals which are of great importance for human health. Resistance of bacteria to antimicrobial substances (antibiotics and chemotherapeutics) is one of the most significant problems in public health. The problem of antimicrobial resistance is related to pathogenic bacteria and zoonotic agents, but this resistance also burdens apathogenic bacteria that transmit resistance genes through the food chain. The aim of this study was to examine the antimicrobial activity of *Allium ursinum* L. on the growth of apathogenic bacteria isolated from food of animal origin and determine the type of action on the tested isolates. The plant material used in this paper is a fresh leaf of *Allium ursinum* L. harvested on the slopes of the Kruševo Brdo mountain, Kotor Varoš municipality, Republic of Srpska, Bosnia and Herzegovina. Sremush leaves were chopped, sunflower oil was added and a thick mass of sremush was diluted with distilled water in a ratio of sremush:water 80:20%. The agar diffusion method was used to examine the antibacterial activity. Antibacterial activity was tested on 10 bacterial coagulase strains of negative staphylococci isolated from food of animal origin, from the collection of the Laboratory for Microbiology of food, feed and water of the Public Institution Veterinary Institute of Republic of Srpska "Dr Vaso Butozan" Banja Luka. The results of the analysis indicate good inhibitory properties of *Allium ursinum* L. on 8 out of 10 tested apathogenic bacteria with an inhibition zone from 9.67 mm to 45.00 mm. Bactericidal activity was confirmed in four isolates in all three replicates, and bacteriostatic in two isolates. Given that the contribution of apathogenic microphores from food of animal origin in the transmission of antimicrobial resistance through the food chain is not fully known, that the results indicate that *Allium ursinum* L. has good antibacterial properties, future studies should focus on more bacteria.

Key words: *Allium ursinum* L., apathogenic bacteria, antibacterial activity, resistance

SI - 4

UTICAJ GRANICE ODREĐIVANJA NA POZITIVAN NALAZ *LISTERIA MONOCYTOGENES* U UZORCIMA MLIJEKA

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Sažetak: Bakterija *Listeria monocytogenes* unesena hranom izaziva bolest listeriozu, na koju su osetljive visoko rizične grupe populacije (trudnice, djeca, onkološki bolesnici,...). Simptomi listerioze su vrlo raznoliki, mogu da traju od nekoliko dana do nekoliko nedjelja, a u nekim slučajevima se završavaju smrtnim ishodom. Prisustvo listerije u hrani obično se povezuje za hranom spremnom za konzumaciju (RTE), nepasterizovanim mlijekom, mliječnim proizvodima od nepasterizovanog mlijeka, itd. Za određivanje granice detekcije (LOD) bakterije *Listeria monocytogenes* pripremljena su četiri nivoa vještačke kontaminacije inicijalnog razređenja uzoraka sterilizovanog viskokom temperaturom (UHT) mlijeka, dostupnog na tržištu. Predbogaćenje i bogaćenje do presijavanja na dve čvrste podloge provedeno je prema modifikovanoj metodi ISO 11290-1:2017. Presijavanje na ALOA podlogu provedeno je samo nakon bogaćenja, a paralelno je provedeno i dodatno presijavanje na krvne ploče. Pozitivni nalazi, broj kontaminiranih uzoraka i nivo kontaminacije obrađeni su u PODLOD_ver11.xls EXCEL programu za procjenu POD funkcije i LOD kvalitativnih metoda za mikrobiološka ispitivanja, od Wilrich i Wilrich. Dobijeni rezultati pokazuju prihvatljivu statistiku efekta matriksa, LOD50% je 0,403 [0,181; 0,899] cfu/inicijalnom razređenju uzorka, odnosno LOD95% je 1,742 [0,781; 3,885] cfu/inicijalnog razređenja uzorka. Pozitivni nalazi na ALOA podlozi u potpunosti su ispraćeni nalazima na krvnim pločama, te se dobijene granice određivanja odnose na metodu izolacije listerije iz mlijeka za svaku od podloga. Dobijeni rezultati su također doprinos boljem razumijevanju niskog nivoa kontaminacije i neophodnosti ispitivanja najmanje pet jedinica istog uzorka zbog otkrivanja *Listeria monocytogenes.*

Ključne rječi: *Listeria monocytogenes,* mlijeko, granica određivanja (LOD)

THE IMPACT OF LEVEL OF DETECTION ON POSITIVE FINDING OF *LISTERIA MONOCYTOGENES* IN MILK

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Abstract: The bacterium *Listeria monocytogenes* ingested with food causes the so-called listeriosis, to which groups of the population (pregnant women, children, oncology patients, etc.) are susceptible The symptoms of listeriosis are very diverse, they can last from days to several weeks, and in some cases, lead to death. The presence of listeria in food is usually associated with ready-to-eat foods, unpasteurized milk, dairy products made from unpasteurized milk, etc. To determine the limit of detection (LOD) of the bacterium *L. monocytogenes*, four levels of artificial contamination of the initial dilution of ultra-high temperature processed milk (UHT milk) available on the market were prepared. Pre-enrichment and enrichment until streaking on the two solid media were performed according to the modified method ISO 11290-1:2017. Streaking on the ALOA medium was performed only after the enrichment, and the additional streaking on Blood agar plates was performed in parallel. Positive findings, the number of contaminated samples, and the contamination level were processed using the calculation program PODLOD_ver11.xls EXCEL to estimate the POD function and the LOD of a qualitative microbiological measurement method by Wilrich and Wilrich. The obtained results show comprehensible matrix effect statistics, the LOD50 is 0,403 [0,181; 0,899] CFU/initial sample dilution and the LOD95 is 1,742 [0,781; 3,885] CFU/initial sample dilution. The number of positive findings on the ALOA medium is similar to the findings on the Blood agar plates, and consequently, the obtained LOD refers to the method of isolating *Listeria* from milk for each of the media used. The obtained results contribute to a better understanding of the low level of contamination and the need to test at least five units of the same sample for the detection of *L. monocytogenes*.

Key words: *Listeria monocytogenes*, milk, the limit of detection (LOD)

SI - 5

KULTURA ISHRANE U HERCEGOVINI U KASNOM SREDNJEM VIJEKU

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Sažetak: Znamo da je kroz istoriju potraga za hranom pokretala čovjeka, da se zbog hrane naseljavao na određenom mjestu, a stvaranjem njenih viškova započelo je društveno raslojavanje. Drugim riječima, hrana je presudno uticala na ljudsku istoriju i dalje utiče jer ako nema dovoljno hrane, onda vrlo vjerovatno nema ni dovoljno drugih resursa koji bi usmjerili dalje kretanje i razvoj jedne zajednice. Kada se promisli o navedenom, teško je ne zapitati se zašto istorija ishrane zauzima sporedno mjesto iza političke istorije? Ishrana je, dakle, određivala tok istorije i na području Balkana. Područje interesa je rekonstrukcija hrane/ishrane stanovništva u Hercegovini kroz razdoblje kasnog srednjeg vijeka (1200-1500g.). Ovaj period je proučavan uglavnom na osnovu dostupnih vizantijskih, srpskih i zapadoevropskih izvora ali i izvora Dubrovačke republike, Osmanskog carstva i određenih, vrlo skromnih, podataka sa područja Hercegovine i teritorija sa kojima je graničila (Bosna, Dalmacija i sl.). Za jedno ovakvo istraživanje bilo je neophodno biti upućen na čitav niz izvora jer ni jedna nacionalna kuhinja, mada u srednjem vijeku vrlo obazrivo se moramo koristiti pojmom nacionalnog, ne može se sama po sebi izdvojiti u odnosu na ostale u regionu, pa i one dalje, na kontinentu. Zato je prirodno da njeno gastronomsko nasljeđe sadrži čitav niz elemenata za koje se ne može isključivo reći da su njeni. To nasljeđe predstavlja kulturni sistem pa se u analizi prehrambenih navika nužno uključuje i njegovo klasno određenje: navike i jelovnici vlastele, građana i seljaka, sveštenstva i vojnika. Ipak, u srednjovijekovnoj Hercegovini žitarice su bile glavna namirnica koja se, pored hljeba, jela u velikim količinama kroz razne kaše, napravljene od prosa ili ječma. Od povrća se dosta koristio crni i bijeli luk odnosno ljuto zelje kako se tada zvalo. Iako je meso bilo cijenjeno može se reći da su obični ljudi meso jelo rijetko i to u posebnim prilikama. Najviše se jela jagnjetina, svinjsko meso dosta rjeđe, a junetina gotovo da se nije koristila.

Ključne riječi: Hercegovina, ishrana, Srednji vijek

FOOD CULTURE IN HERZEGOVINA IN THE LATE MIDDLE AGES

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Abstract: We know that throughout history, people were driven by the search for food and because of food they settled in a certain place, with the creation of their surpluses, social stratification began. In other words, food has a decisive influence on human history and continues to influence it because if there is not enough food, then it is very likely that there are not enough other resources that would direct the further movement and development of a community. When you think about it, it's hard not to wonder why the history of nutrition takes a secondary place behind political history? Nutrition, therefore, determined the course of history in the Balkans as well. The field of interest is the reconstruction of food/nutrition of the population in Herzegovina through the period of the late Middle Ages (1200-1500). This period was studied mainly on the basis of available Byzantine, Serbian and Western European sources, but also sources of the Republic of Dubrovnik, the Ottoman Empire and certain, very modest, data from the area of Herzegovina and the territories it bordered (Bosnia, Dalmatia, etc.). For a research like this, it was necessary to refer to a whole range of sources because not a single national cuisine, although in the Middle Ages we must use the term national very carefully, cannot stand out by itself in relation to others in the region, even those further away, on the continent. That is why it is natural that its gastronomic heritage contains a whole series of elements that cannot be exclusively said to be its own. This heritage represents a cultural system, so the analysis of eating habits necessarily includes its class determination: the habits and menus of rulers, citizens and peasants, clergy and soldiers. Nevertheless, in medieval Herzegovina, crops were the main and very important food, which, in addition to bread, was eaten in large quantities through various porridges made from millet or barley. Of the vegetables, onions and garlic, or hot greens as they were called then, were used a lot. Although meat was valued, it can be said that ordinary people ate meat rarely and only on special occasions. Lamb was eaten the most, pork much less often, and beef was almost never used.

Keywords: Herzegovina, diet, Middle Ages

SI - 6

PROMJENE VISKOZITETA KRAVLJEG I SOJINOG JOGURTA TOKOM SKLADIŠTENJA UZ PRIMJENU INULINA

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Sažetak: Cilj ovog rada bio je ispitati promjene viskoziteta kravljeg i sojinog probiotskog jogurta sa različitim sadržajem inulina (IN) tokom 10 dana čuvanja na temperaturi 5°C. Kravlje i sojino mlijeko bez dodataka i sa dodatkom 1,0% IN i 2,0% IN je fermentisano sa 0,005g/l inokuluma probiotske starter kulture DriSet BIOFLORA, ABY 438: *Lactobacillus acidophilus*, *Streptococcus thermophilus* and *Lactobacillus bulgaricus* (Vivolac Culture Corporation, Indiana, USA). Proizvedene su različite varijante kravljeg (cy) i sojinog (sy) jogurta (Cont; 1%IN-cy; 2%IN-sy; sy;1%IN-sy; 2%IN-sy). Promjene viskoziteta praćene su 1., 5. i 10. dana skladištenja. Viskozitet uzoraka mjeren je tokom 3 min (očitavana je vrijednost svakih 30 s) pri brzini rotacije vretena (Ø4) od 20 o/m, korištenjem *BROOKFIELD Digital Viscometer, DV-E* (Brookfield Engineering Laboratories, USA). Praćene su i promjene pH vrijednosti tokom fermentacije i skladištenja pomoću laboratorijskog pH-metra (pH HI2002 Meter, HANNA Instruments, USA). Svi uzorci jogurta proizvedeni od kravljeg mlijeka su fermentisali za 5 sati, a uzorci proizvedeni od sojinog mlijeka za 8 sati, što znači da suplementacija inulinom nije uticala na brzinu fermentacije. Tokom skladištenja na 5°C nešto više pH vrijednosti zabilježene su kod uzoraka sa dodatkom 1%IN,sy i 2%IN,sy, u odnosu na sve ostale uzorke, ali je unutar svakog uzorka pojedinačno uočena stabilnost tokom 10 dana skladištenja. Viskozitet proizveden od kravljeg mlijeka, bez obzira na dodatke, imao je statistički značajno veće vrijednosti ($p<0,05$) u odnosu na vrijednosti viskoziteta sojinog jogurta. Unutar samih uzoraka, ne primjećuju se značajne promjene u viskozitetu od 1. do 10. dana skladištenja.

Ključne riječi: viskozitet, kravlji i sojin jogurt, inulin, vrijeme skladištenja

CHANGES IN THE VISCOSITY OF COW AND SOY YOGURT DURING STORAGE WITH THE APPLICATION OF INULIN

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Abstract: The aim of this work was to examine changes in the viscosity of cow's and soy probiotic yogurt with different inulin content (IN) during 10 days of storage at 5°C. Cow and soy milk without additives and with the addition of 1.0% IN and 2.0% IN were fermented with 0,005g/l inoculum of mixed probiotic starter culture DriSet BIOFLORA, ABY 438: *Lactobacillus acidophilus*, *Streptococcus thermophilus* and *Lactobacillus bulgaricus* (Vivolac Culture Corporation, Indiana, USA). Different varieties of cow (cy) and soy (sy) yogurt (Cont; 1%IN-cy; 2%IN-sy; sy;1%IN-sy; 2%IN-sy) were produced. Viscosity changes were monitored on the 1st, 5th and 10th storage days. The viscosity of the samples was measured during 3 min (the value was read every 30 s) at a rotation speed of the spindle (Ø4) of 20 rpm, using a BROOKFIELD Digital Viscometer, DV-E (Brookfield Engineering Laboratories, USA). Changes in pH during fermentation and storage were also observed using a laboratory pH meter (pH HI2002 Meter, HANNA Instruments, USA). All yogurt samples produced from cow's milk fermented in 5 hours, and samples produced from soy milk in 8 hours, which means that inulin supplementation did not affect the rate of fermentation. During storage at 5°C, slightly higher pH values were recorded in samples with the addition of 1%IN,sy and 2%IN,sy, compared to all the other samples, but stability was observed inside each sample individually, during 10 storage days. The viscosity produced from cow's milk, regardless of additives, had statistically significantly higher values ($p<0.05$) compared to the viscosity values of soy yogurt. Inside the samples, no significant changes in viscosity were observed from the 1st to the 10th day of storage.

Keywords: viscosity, cow and soy yogurt, inulin, storage time

SI - 7

OCJENJIVANJE SENZORNIH KARAKTERISTIKA I ZDRAVSTVENE BEZBJEDNOSTI PROIZVODA OD MESA KOKOŠAKA

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Sažetak: Meso kokošaka je više decenija u upotrebi kao osnovna sirovina i zamjena dijela mesa goveda i svinja u izradi barenih kobsica. Međutim, izrada dimljenih i sušenih proizvoda od mesa kokošaka u komadu nije prisutna u većini država u svijetu. Poslednjih godina raste interes industrije za izradu ovih proizvoda. Tokom razvoja novih proizvoda od mesa kokošaka, veoma je korisno koristiti postojeće ili tradicionalne postupke za izradu proizvoda od mesa goveda i svinja. Prenos znanja i iskustva stečenih tokom tradicionalnih postupaka proizvodnje u industijskim uslovima daje brojne mogućnosti za izradu bezbjednih proizvoda standardizovanih karakteristika. Cilj ovog rada je da se ispitaju senzorna svojstva sušenih i barenih proizvoda od mesa kokošaka tokom čije proizvodnje je korišteno osam različitih tretmana. Senzorno ocjenjivanje je provedeno u laboratoriji za senzorno ocjenjivanje od strane 6 obučenih ocjenjivača (profesora i asistenata fakulteta). Tokom ocjenjivanja korišten je test deskriptivne analize sa skalom od 5 vrijednosti. Tokom statističke obrade rezultata senzorne analize korišten je neparametarski Kruskal-Wallis test/two-tailed test. Statistička značajnost razlika između parova ispitana je pomoću Dunn's procedure. Testiranje je provedeno u Excelu pomoću statističkog programa XLSTAT (XLSTAT Version 2014, 5.03). Među barenim proizvodima najveću ocjenu ocjenjivači su dali uzorcima proizvoda iz grupe EG I (95,3%). Od sušenih proizvoda, uzorci iz grupe EG VIII dobili su najveću vrijednost procenat od maksimalno mogućeg kvaliteta (88,8%). Rezultati do kojih se došlo tokom provedenih istraživanja, pokazali su da proizvodi od mesa kokošaka izrađeni u industrijskim uslovima prema tradicionalnim tehnologijama imaju visok senzorni kvalitet, što ukazuje da će biti dobro prihvaćeni od strane potrošača.

Ključne riječi: meso kokošaka, tradicionalni proizvodi, industrijska proizvodnja, senzorna ocjena

EVALUATION OF SENSORY CHARACTERISTICS AND HEALTH SAFETY OF CHICKEN MEAT PRODUCTS

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Abstract: Chicken meat has been used for decades as a basic raw material and as a substitute for part of beef and pork in the production of boiled sausages. However, the production of smoked and dried chicken meat products is not present in most countries in the world. In recent years, the industry's interest in making these products has been growing. During the development of new chicken meat products, it is very useful to use existing or traditional procedures for the production of beef and pork products. The transfer of knowledge and experience gained during traditional procedures to production in industrial conditions provides numerous opportunities for safe production products with standardized characteristics. The aim of this work is to examine the sensory properties of dried and boiled chicken meat products during the production of which eight different treatments were used. Sensory evaluation was performed in the sensory evaluation laboratory by 6 trained evaluators (professors and faculty assistants). During the assessment, a descriptive analysis test with a scale of 5 values was used. The non-parametric Kruskal-Wallis test/two-tailed test was used during the statistical processing of the sensory analysis results. Statistical significance of differences between pairs was tested using Dunn's procedure. Testing was performed in Excel using the statistical program XLSTAT (XLSTAT Version 2014, 5.03). Among the boiled products, the evaluators gave the highest rating to product samples from group EG I (95.3%). Of the dried products, samples from group EG VIII obtained the highest percentage of maximum possible quality (88.8%). The obtained results showed that chicken meat products made in industrial conditions according to traditional technologies have a high sensory quality, which indicates that they will be well accepted by consumers.

Key words: chicken meat, traditional products, industrial production, sensory evaluation

SI - 8

PROCJENA UKUPNOG SADRŽAJA FLAVONOIDA, ANTIOKSIDATIVNE AKTIVNOSTI I BOJE RAZLIČITIH UZORAKA MEDA

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Sažetak: Cilj ovog rada bio je ispitati i analizirati intenzitet boje, ukupan sadržaj flavonoida i antioksidativnu aktivnost, te utvrditi povezanost između njih u različitim uzorcima meda, sa različitih geografskih područja. Ukupno je analizirano 12 uzoraka meda, 5 je prikupljeno sa područja grada Prijedora (3 uzorka meda od lipe, 1 bagremov med i 1 cvjetni), po 1 uzorak iz opštine Jezero (livadski med) i Mrkonjić Grada (livadski med) te iz mjesta Čelarevo u Republici Srbiji (med od suncokreta), dok su ostala 4 uzorka meda nabavljena u trgovini (2 livadska, 1 cvjetni i 1 bagremov med). Intenzitet boje određen je pomoću Pfund metode, a vrijednosti su se kretale od 19,24 mm (bagremov med-kupovni) do 201,1 mm (livadski med sa teritorije opštine Jezero). Sadržaj ukupnih flavonoida dobijen je primjenom metode stvaranja kompleksa sa aluminijum hloridom, a katehin (CE) je upotrijebljen kao standard. Dobijeni rezultati za flavonoide su se kretali od 0,044 mg CE/100 g meda (med od suncokreta), do 54 mg CE/100 g (bagremov med sa teritorije Prijedora). Za određivanje antioksidanasa korišten je DPPH test, a dobijeni rezultati, koji su izraženi kao IC_{50} (mg/ml), su pokazali da cvjetni med proizveden na teritoriji grada Prijedora ima najveći antioksidativni kapacitet (10,1 mg/ml). Podaci su obrađeni u Excel-u 2016, a statistička analiza pokazala je pozitivnu slabu korelaciju između intenziteta boje i ukupnog sadržaja flavonoida (r^2=0,18), negativno umjerenu korelaciju između intenziteta boje i antioksidativne aktivnosti (r^2=-0,42) i slabo negativnu korelaciju između flavonoida i antioksidativne aktivnosti (r^2=-0,14).

Ključne riječi: med, boja, flavonoidi, antioksidativna aktivnost

ASSESSMENT OF TOTAL FLAVONOID CONTENT, ANTIOXIDANT ACTIVITY AND COLOR OF DIFFERENT HONEY SAMPLES

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Abstract: The aim of this work was to examine and analyze color intensity, total flavonoid content and antioxidant activity, and determine the relationship between them in different honey samples from different geographical areas. A total of 12 honey samples were analyzed, 5 were collected from the area of the city of Prijedor (3 samples of linden honey, 1 acacia honey and 1 flower honey), 1 sample each from the municipality of Jezero (meadow honey) and Mrkonjić Grad (meadow honey) and from the place Čelarevo in the Republic of Serbia (sunflower honey), while the remaining 4 honey samples were purchased in the store (2 meadow, 1 flower and 1 acacia honey). The color intensity was determined using the Pfund method, and the values ranged from 19.24 mm (store-bought acacia honey) to 201.1 mm (meadow honey from municipality of Jezero). The content of total flavonoids was obtained using the method of forming a complex with aluminum chloride, and catechin (CE) was used as a standard. The obtained results for flavonoids ranged from 0.044 mg CE/100 g of honey (sunflower honey) to 54 mg CE/100 g (acacia honey from the territory of Prijedor). The DPPH test was used to determine antioxidants, and the obtained results, expressed as IC50 (mg/ml), showed that the flower honey produced in the territory of the city of Prijedor has the highest antioxidant capacity (10.1 mg/ml). The data were processed in Excel 2016, and statistical analysis showed a positive weak correlation between color intensity and total flavonoid content (r^2=0.18), a negative moderate correlation between color intensity and antioxidant activity (r^2=-0.42) and weak negative correlation between flavonoids and antioxidant activity (r^2=-0.14).

Key words: honey, color, flavonoids, antioxidant activity

SI - 9

PREHRAMBENI PROIZVODI SA POTENCIJALOM GEOGRAFSKIH OZNAKA U BOSNI I HERCEGOVINI

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Sažetak: Svi regionalni prehrambeni proizvodi nemaju potencijal geografske oznake (GO). Postoje neki osnovni uslovi da bi bili GO. Jedna od njih je veza između geografskog porijekla i proizvoda, reputacije, kvaliteta i/ili načina obrade. Što je još važnije, kvalitet, reputacija ili druge karakteristike proizvoda treba da se u suštini pripisuju njegovom geografskom porijeklu. Prirodni i/ili ljudski faktori treba da utiču na kvalitet regionalnog proizvoda. Drugi uslov je da proizvod treba da ima istorijsku pozadinu. Proizvod sa potencijalom GO treba da ima neke različite karakteristike od sličnih proizvoda sa drugog područja. Što je jača veza proizvoda sa njegovim porijeklom, specifičnošću i reputacijom, veći je njegov GO potencijal. Od aprila 2021. do februara 2022. godine autori su, uz podršku REU, FAO Projekta TCP/BIH/3801/C1, sproveli terenska i literaturna istraživanja. Kako bi se identifikovali proizvodi sa potencijalom GO u BiH, obiđena su 42 grada/opštine u kojima su obavljeni intervjui sa predstavnicima institucija i naučnoistraživačkih ustanova, privrednih komora, zadruga/udruženja, poljoprivrednih proizvođača, nevladinih organizacija i udruženja potrošača. Pripremljen je upitnik koji je upućen na adrese svih gradova/opština u BiH. Svi podaci prikupljeni iz primarnih i sekundarnih izvora organizovani su prema regijama proizvodnje/prerade i kategorijama proizvoda. Takođe, određeno je klasifikovanje proizvoda prema entitetima, kantonima i regijama. Za određivanje prioriteta težina kriterijuma došlo se primjenom implementacije analitičko hijerarhijskog procesa (AHP). Sortiranje proizvoda izvršeno je prema njihovoj ukupnoj ocjeni. Identifikovano i obrađeno je 110 proizvoda, od kojih je 68 ispunilo kriterijume kao proizvodi sa potencijalom GO.

Ključne riječi: Hrana, geografska oznaka, potencijal

FOOD PRODUCTS WITH THE POTENTIAL OF GEOGRAPHICAL INDICATIONS IN BOSNIA AND HERZEGOVINA

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Abstract: All regional food products do not have the potential of a geographical indication (GI). There are some basic conditions to be a GI. One of them is the connection between the geographical origin and the product, reputation, quality and/or processing method. More importantly, the quality, reputation or other characteristics of the product should be essentially attributable to its geographical origin. Natural and/or human factors should influence the quality of the regional product. Another condition is that the product should have a historical background. A product with GI potential should have some different characteristics from similar products from another area. The stronger the product's connection to its origin, specificity and reputation, the greater it is GI potential. From April 2021 to February 2022, the authors, with the support of REU, FAO Project TCP/BIH/3801/C1, conducted field and literature research. In order to identify products with GI potential in BiH, 42 cities/municipalities were visited where interviews were conducted with representatives of institutions, scientific research institutions, chambers of commerce, cooperatives/associations, agricultural producers, non-governmental organizations and consumer associations. A questionnaire was prepared and sent to the addresses of all cities/municipalities in Bosnia and Herzegovina. All data collected from primary and secondary sources are organized according to production/processing regions and product categories. Also, the classification of products according to entities, cantons and regions is determined. The prioritization of criteria weights was achieved by applying the implementation of the Analytical Hierarchy Process (AHP). Sorting of products, was done according to their overall rating. 110 products were identified and processed, of which 68 met the criteria as products with GI potential.

Keywords: Food, geographical indication, potential

SI - 10

ALTERNATIVNA PŠENICA SPELTA (*TRITICUM SPELTA L.)*

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Sažetak: Imperativ postizanja maksimalnih prinosa i profita u biljnoj proizvodnji jedan je od uzroka koji je doveo do zapostavljanja mnogih vrijednih gajenih biljaka, od kojih su neke potpuno nestale, a drugima prijeti nestanak. Gubitak biodiverziteta generalno i agrobiodiverziteta ima štetne posljedice za ekosistem i globalni prehrambeni sistem. Alternativne gajene biljke u svijetu gaje se na malim i vrlo promjenljivim površinama, nisu glavni nosioci komercijalne proizvodnje, a mogu se definisati kao zamjena postojećim gajenim vrstama. To mogu biti i vrste koje su se nekada gajile na određenim područjima, ali su ih potisnule slične biljne vrste koje ostvaruju daleko veće prinose i profit. Druga grupa alternativnih vrsta su one čija je proizvodnja u jednom geografskom području uobičajena i tu predstavljaju glavni usjev, dok u drugim ograničenim područjima mogu biti alternativne biljke. Zbog njihovih poznatih i novootkrivenih nutritivnih osobina, neophodnosti povećanja raznolikosti ishrane i porasta broja pristalica makrobiotičke ishrane, danas se ovi usjevi ponovo vraćaju u proizvodnju i svakodnevnu ishranu. U našem području spelta predstavlja jedno od alternativnih strnih žita. Spelta je jedna od najstarijih pšenica, koja se počela gajiti u mlađem kamenom dobu, prije 7.000 do 9.000 godina. U Evropi je pronađena u arheološkim nalazištima koja datiraju 2.000 godina p.n.e. Sve do polovine XX vijeka spelta je bila veoma važna pljevičasta pšenica u svijetu, ali širenjem nepljevičastih, visokoprinosnih heksaploidnih formi ona gubi na značaju. Zahvaljujući kvalitativnim osobinama ova vrsta pšenice ponovo se počinje gajiti u planinskim područjima Njemačke, Švicarske i Austrije, a sve većim širenjem organske proizvodnje ulazi na obradive površine i drugih država Evrope. Zrno spelte sadrži do 70% ugljenih hidrata, 5-7% celuloze i oko 2% ulja. Bogato je proteinima, čiji sadržaj može biti i do 25%. Sadržaj pojedinih aminokiselina - prolina, glutaminske kiseline, tirozina i asparginske kiseline, u proteinima spelte veći je nego kod obične pšenice. U odnosu na običnu pšenicu sadrži više lipida i nezasićenih masnih kiselina. Zrno je bogato i vitaminima B, E i K, a odlikuje se visokim sadržaj selena, cinka, željeza i mangana, manjim sadržajem fitinske kiseline i nešto nižim sadržajem glutena od obične pšenice. Takođe, ima više

rastvorljivih vlakana i lignina, a manje celuloze i hemiceluloze u odnosu na običnu pšenicu. Zrno je lako svarljivo i pogodno u ishrani djece, bolesnika i starijih osoba. Zajedno sa brašnom drugih žita prave se specijalni hljebovi velike hranljive vrijednosti. Osim brašna, na tržištu se mogu naći i drugi proizvodi poput griza, pahuljica, instant kafe, tjestenine, keksova, bombona, osvježavajućih pića i sl. Zahtjevi tržišta i pogodni agroekološki uslovi izazov su za proizvođače i prerađivače da posvete više pažnje ovoj gajenoj biljnoj vrsti.

Ključne riječi: alternativna strna žita, spelta, nutritivna vrijednost, proizvodi na bazi spelte

ALTERNATIVE WHEAT SPELT (TRITICUM SPELTA L.)

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Abstract: The imperative to achieve maximum yields and profits in plant production is one of the causes that led to neglecting of many valuable cultivated plants, some of which have completely disappeared, and others that are threatened by disappearance. The loss of biodiversity in general and agrobiodiversity has harmful consequences for the ecosystem and the global food system. Alternative cultivated plants in the world are grown on small and highly variable areas, are not the main carriers of commercial production, and can be defined as replacement for existing cultivated species. These can be species that were once cultivated in certain areas, but were supplanted by similar plant species that achieve much higher yields and profits. Another group of alternative species are those whose production in one geographical area is common and represent the main crop, while in other limited areas they can be alternative plants. Due to their known and newly discovered nutritional properties, the necessity of increasing the diversity of the diet and the increase in the number of supporters of the macrobiotic diet, today these crops are returning to production and daily diet. In our area, spelt is one of the alternative small grains. Spelt is one of the oldest wheat species, which began to be cultivated in the younger Stone Age, 7,000 to 9,000 years ago. Archaeological sites dating back to 2,000 BC were discovered in Europe. Until the mid of the 20th century, spelt was a very important hulled wheat in the world, but with the spread unhulled, high-yielding hexaploid wheat forms, it started to lose importance. Due to its qualitative

properties, this type of wheat is starting to be cultivated again in the mountainous areas of Germany, Switzerland and Austria, and with the growing spread of organic production, it is entering the arable land of other European countries. Spelt grain contains up to 70% carbohydrates, 5-7% cellulose and about 2% oil. It is rich in proteins, with the content up to 25%. The content of certain amino acids - proline, glutamic acid, tyrosine and aspartic acid - in spelt is higher than in common wheat. Compared to common wheat, it contains more lipids and unsaturated fatty acids. The grain is also rich in vitamins B, E and K, and is characterized by a high content of selenium, zinc, iron and manganese, a lower content of phytic acid and a slightly lower content of gluten than common wheat. Therefore it has more soluble fibres and lignin, and less cellulose and hemicellulose compared to common wheat. The grain is easily digestible and suitable for children diet, patients and the elderly people. Mixture with the flour of other grains is used for production of special breads of high nutritional value. In addition to flour, other products such as semolina, flakes, instant coffee, pasta, biscuits, candies, soft drinks, etc. can be found on the market. Market demands and suitable agroecological conditions are a challenge for producers and processors, and orient them to pay more attention to this cultivated plant species.

Key words: alternative small grains, spelt, nutritional value, spelt based products

SI - 11

DENTALNE FOBIJE KAO FAKTOR RIZIKA ORALNOG ZDRAVLJA ODRASLIH OSOBA

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Sažetak: Dentalna fobija je široko rasprostranjen problem koji pogađa odraslu populaciju. Dentalna anksioznost i strah uzrokuju kašnjenje posjeti stomatologu i otežavaju stomatološku intervenciju što dovodi do problema za oralno i zubno zdravlje. Cilj ovog istraživanja bio je pregled istraživanja o prisustvu i uticaju dentalnih fobija na stomatološke intervencije. Pretražene su dvije elektronske baze podataka (PubMed i Google akademik) sa jezičkim ograničenjem (engleski i srpski jezik) od 2018. do 2023. godine. Ekstrakcijom podataka izvršen je izbor studija. Strategija pretraživanja identifikovala je 695 studija. Nakon uklanjanja duplikata i različito procjenjivanih radova (653), izdvojili smo 38 radova koje smo u cijelosti pročitali i na osnovu sličnosti i kriterijumu za uključivanje u pregled je ušlo 9 radova. Ukupno je obuhvaćeno 1930 osoba starijh od 18 godina. Analize podgrupa su pokazale veću prevalenciju dentalnih fobija među ženama i mlađim odraslim osobama kao i povezanost dentalnog straha sa lošom oralnom higijenom.Visok nivo dentalnog straha prevladava kod odraslih širom svijeta, a češći su među ženama.

Ključne riječi: dentalne fobije, oralno zdravlje, odrasle osobe

DENTAL PHOBIAS AS A RISK FACTOR FOR ORAL HEALTH IN ADULTS

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Abstract: Dental phobia is a widespread problem that affects the adult population. Dental anxiety and fear cause delays in visits to the dentist and make dental intervention more difficult, leading to problems for oral and dental health. The aim of this study was to review research on the presence and impact of dental phobias on somatological interventions. Two electronic databases (PubMed and Google Scholar) with language restrictions (English and Serbian) were searched from 2018 to 2023. Data extraction was used to select studies. The search strategy identified 695 studies. After removing duplicates and differently evaluated works (653), we selected 38 works that we read in their entirety and based on similarity and criteria for inclusion, 9 works were included in the review. A total of 1930 persons over the age of 18 were included. Subgroup analyzes showed a higher prevalence of dental phobias among women and younger adults as well as an association of dental fear with poor oral hygiene. High levels of dental fear are prevalent in adults worldwide, and are more common among women.

Key words: dental phobias, oral health, adults

SI – 12

ZDRAVSTVENA ULOGA ŠUMA U VREMENU POSTKOVID OPORAVKA

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Sažetak: Šumski ekosistemi, pored ekonomske i ekološke funkcije, imaju važnu društvenu funkciju u okviru koje je posebno važna njihova zdravstvena funkcija. Najnovija pandemija globalnog značaja izazvana korona visrusom uticala je ne samo na ljudsko zdravlje već je izazvala niz ekonomskih, ekoloških i društvenih poremećaja. Uspješan oporavak ljudi od bolesti Corona-19 (SARS-CoV-2) izazvane korona virusom, koju je Svjetska zdravstvena organizacija (World Health Organization, WHO) proglasila pandemijom zavisi od uslova životne sredine u kojoj se vrši postkovid oporavak. Realnost dvostruke krize (COVID-19 i klimatskih promjena) i značaj zdravstvene funkcije šumskih ekosistema naglašavaju važnost obrazovanja i nauke o šumskoj fitoklimi. Zdrave šume ublažavaju rizik od budućih pandemija stvaranjem tampon zona koje smanjuju interakcije između ljudi i potencijalnih uzročnika bolesti. Oporavak ljudi od pandemije u uslovima šumske fitoklime („zeleni oporavak“) je prilika koju koristi stanovništvo brojnih država, a naročito ako imaju komparativnu prednost u pogledu očuvanosti prirodnih šuma. Urbane šume i šume u okviru banja i prirodnih lječilišta igraju ulogu u oporavku organa za disanje, posebno nakon teških plućnih, respiratornih oboljenja. Naime, zdravlje ljudi, a naročito preventivna zaštita zdravlja u urbanim sredinama, može se poboljšati samo ako se prirodni šumski ekosistemi zaštite, obnavljaju i ako je njihov razvoj zasnovan na održivosti. U ovom radu autori su postavili cilj da na osnovu najnovijih istraživanja o ekološkoj i socijalnoj ulozi šuma ukažu na njihov značaj za postkovid oporavak ljudi. Tokom istraživanja autori su koristili više radova koji obrađuju problematiku uticaja specifične fitoklime urbanih šuma na oporavak nakon bolesti uzrokovane korona virusom. Cilj ovog rada je da se ukaže na razvoj svijesti građana o značaju zdravstvenih funkcija šuma. Intenzivne i redovne aktivnosti ljudi u šumama sa posebnom zdravstveno-rekreativnom namjenom predstavljaju budućnost razvoja tzv. „šumske medicine“. Značaj novih metoda učenja o zdravstvenoj ulozi šuma za oporavak nakon bolesti sve više je prisutan u multikulturalnoj obrazovnoj praksi širom svijeta.

Ključne riječi: šumski ekosistemi, postkovid oporavak, obrazovanje

THE HEALTH ROLE OF FORESTS IN THE TIME OF POST-COVID RECOVERY

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Abstract: Forest ecosystems, in addition to economic and ecological functions, have an important social function, within which their health function is especially important. The latest pandemic of global significance caused by the corona virus affected not only human health, but caused a series of economic, ecological and social disturbances. The successful recovery of people from the disease Corona-19 (SARS-CoV-2) caused by the corona virus, which the World Health Organization (WHO) declared a pandemic, depends on the environmental conditions in which the post-covid recovery takes place. The reality of the double crisis (COVID-19 and climate change) and the importance of the health function of forest ecosystems emphasize the importance of education and science about forest phytoclimate. Healthy forests mitigate the risk of future pandemics by creating buffer zones that reduce interactions between people and potential disease agents. The recovery of people from the pandemic in the conditions of the forest phytoclimate ("green recovery") is an opportunity used by the population of many countries, especially if they have a comparative advantage in terms of the preservation of natural forests. Urban forests and forests within spas and natural spas play a role in the recovery of the respiratory organs, especially after severe lung, respiratory diseases. Namely, people's health, and especially preventive health care in urban areas, can only be improved if natural forest ecosystems are protected, restored and their development is based on sustainability. In this paper, the authors set the goal of pointing out their importance for post-covid recovery based on the latest research on the ecological and social role of forests. During the research, the authors used several papers dealing with the issue of the impact of the specific phytoclimate of urban forests on recovery after the disease caused by the corona virus. The aim of this paper is to point out the development of the world of citizens about the importance of the health functions of forests. Intensive and regular activities of people in forests with a special health-recreational purpose represent the future of development of the so-called. "forest medicine". The importance of new methods of learning about the health role of forests for recovery after illness is increasingly present in multicultural educational practice around the world.

Key words: forest ecosystems, postcovid recovery, education

SI - 13

EKOLOŠKE POSLJEDICE POJAVE KATASTROFA UZROKOVANIH ELEMENTARNIM NEPOGODAMA I MJERE ZAŠTITE

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Sažetak: Elementarne nepogode koje se u različitim oblicima dešavaju i na našem području pored toga što dovode do ugrožavanja života i zdravlja stanovništva, uzrokuju i značajne materijalne štete te značajno uzrokuju zagađenje životne sredine. Najznačajniji oblici i profili opasnosti na ovom području su: poplave, zemljotres, šumski požari, olujno nevrijeme i drugi. Svaki od ovih profila opasnosti ima određene i specifične uticaje na životnu sredinu, a prije svega uzrokuju zagađenje voda, vazduha, zemljišta i šumskih ekosistema. Pojave različitih oblika i količina otpadnih i opasnih materija kao posljedica elementarnih nepogoda takođe predstavlja značajan ekološki problem. Da bi se uspješno sprovodile mjere zaštite životne sredine kod prisutnih profila opasnosti odnosno u slučaju pojave elementarnih nepogoda neophodno je preduzeti mjere preventivnog karaktera, konkretne mjere zaštite životne sredine kao i kroz mjere otklanjanja posljedica elementarnih nepogoda. Cilj rada je da se na bazi procijenjenih i potencijalno prisutnih elementarnih nepogoda u lokalnim zajednicama izvrši analiza obima i nivoa ugroženosti životne sredine, organizovanosti i aktivnosti na rješavanju potencijalno prisutnih ekoloških problema te utvrde i predlože neophodne mjere zaštite životne sredine. Za uspješno provođenje mjera zaštite životne sredine u slučaju pojave elementarne nepogode neophodno je u lokalnim zajednicama uspostaviti organizacioni model koji podrazumjeva dobro koordinisanu aktivnost gradskog - opštinskog štaba za vanredne situacije sa organom uprave nadležnim za životnu sredinu i stručno-specijalizovanim ustanovama. Na operativnim aktivnostima na provođenju hitnih mjera angažuju se specijalizovane jedinice za zaštitu i spašavanje, javna preduzeća, ustanove i stanovništvo. Osnovni preduslov za efikasno sprovođenje mjera zaštite životne sredine je utvrđivanje nivoa zagađenosti i utvrđivanja zone zagađenosti na osnovu čega se na predlog stručno-specijalizovane ustanove preduzimaju odgovarajuće mjere zaštite i spašavanja stanovništva koje će u najkraćem mogućem vremenskom periodu otkloniti opasnost odnosno dovesti do smanjenja nivoa zagađenja.

Ključne riječi: životna sredina, elementarna nepogoda, mjere zaštite

ENVIRONMENTAL CONSEQUENCES OF DISASTERS CAUSED BY ELEMENTARY DISADVANTAGES AND PROTECTION MEASURES

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Abstract: Natural disasters that occur in various forms in our area, in addition to endangering the lives and health of the population, also cause significant material damage and significantly cause environmental pollution. The most significant forms and profiles of danger in this area are floods, earthquakes, forest fires, storms and others. Each of these hazard profiles has certain and specific impacts on the environment, and above all they cause pollution of water, air, soil and forest ecosystems. The appearance of various forms and amounts of waste and hazardous materials as a consequence of natural disasters also represents a significant ecological problem. In order to successfully implement environmental protection measures in the presence of hazard profiles, that is, in the event of natural disasters, it is necessary to take measures of a preventive nature, concrete environmental protection measures as well as to eliminate the consequences of natural disasters. The goal of the work is to analyze the scope and level of environmental integration, organization and activities to solve potentially present environmental problems, and determine and propose the necessary environmental protection measures based on the estimated and potentially present natural disasters in local communities. For the successful implementation of environmental protection measures in the event of a natural disaster, it is necessary to establish an organizational model in local communities that includes the well-coordinated activity of the city-municipal headquarters for emergency situations with the administrative body responsible for the environment and professional-specialized institutions. Specialized units for protection and rescue, public companies, institutions and the population are engaged in operational activities for the implementation of emergency measures. The basic prerequisite for the implementation of urgent environmental protection measures is the determination of the level of pollution and the determination of the zone of pollution, on the basis of which, on the proposal of a professional and specialized institution, appropriate measures are taken to protect and rescue the population, which will eliminate the danger in the shortest possible period of time, that is, lead to a reduction in the level of pollution.

Key words: environment, natural disaster, protection measures

SI - 14

INDIKATORI EFIKASNOSTI SISTEMA UPRAVLJANJA U PREDUZEĆIMA PREHRAMBENE INDUSTRIJE

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Sažetak: Tokom implementacije standarda upravljanja neophodno je praćenje velikog broja parametara. Ukoliko bi se preduzeće odlučilo za praćenje svih parametara, primjena standarda bila bi veoma skupa, zbog čega je u ovom radu postavljen cilj da se predloži manji broj specifičnih parametara (indikatora efikasnosti), koji ukazuju na ključne promjene u sistemu upravljanja. U toku istraživanja provedena je anketa u preduzećima prehrambenog sektora u četiri države Balkana (Bosna i Hercegovina, Srbija, Sjeverna Makedonija i Crna Gora) u kojoj je od anketiranih preduzeća zatraženo da se izjasne da li primjenjuju (i u kojem obimu) indikatore efikasnosti sistema upravljanja zdravljem i bezbjednosti na radu i indikatore efikasnosti sistema upravljanja zaštitom životne sredine. Provedena je statistička analiza distribucije dobijenih odgovora (Hi kvadrat test, Cramerov V i signifikantnost). Primjenom Kruskal Waliss-ovog testa ispitano je da li se prosječne vrijednosti funkcija odgovora predstavnika preduzeća o primjeni indikatora efikasnosti statistički značajno razlikuju u odnosu na državu u kojoj preduzeće posluje. Kada se analiziraju odgovori preduzeća iz svih država uključenih u ovu anketu, može se zapaziti da preduzeća kao indikatore efikasnosti sistema upravljanja zdravljem i bezbjednosti na radu najčešće prate *Broj incidenata na radu* (86%), *Izgubljeno vrijeme zbog povreda* (76%) i *Broj radnika sa profesionalnim oboljenjima* (71%), a veoma rijetko prate *Broj smrtnih slučajeva* (12%) i *Broj gojaznih osoba među zaposlenim* (22%). Kao indikatore sistema upravljanja zaštitom životne sredine anketirana preduzeća najčešće prate *Stepen smanjenja potrošnje električne energije* (88%) i *Indeks emisije gasova staklene bašte* (37%), a rijetko prate *Stepen povećanja zelenih površina* (26%). Na osnovu Kruskal Waliss-ovog testa može se zaključiti da država u kojoj posluje preduzeće nije imala statistički značajan uticaj na distribuciju odgovora o primjeni analiziranih grupa indikatora efikasnosti.

Ključne riječi: indikatori efikasnosti, sistem upravljanja zaštitom životne sredine, sistem upravljanja zdravljem i zaštitom na radu, prehrambeni sektor, države Balkana

INDICATORS OF EFFICIENCY OF MANAGEMENT SYSTEM IN FOOD INDUSTRY COMPANIES

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Abstract: During the implementation of management standards, it is necessary to monitor a large number of parameters. If the company decided to monitor all parameters, the implementation of the standard would be very expensive. In this work, the goal is to propose a smaller number of specific parameters (indicators of efficiency), which indicate key changes in the management system. In the course of the research, a survey was conducted in food sector companies in four Balkan countries (Bosnia and Herzegovina, Serbia, North Macedonia and Montenegro), in which the surveyed companies were asked to state whether they apply (and to what extent) indicators of the effectiveness of the health management system and safety at work and indicators of efficiency of the environmental protection management system. A statistical analysis of the distribution of the received responses was carried out (Chi-square test, Cramer's V and significance). Applying the Kruskal Walliss test, it was examined whether the average values of the response functions of company representatives regarding the application of efficiency indicators differ statistically significantly in relation to the country in which the company operates. When analyzing the responses of companies from all countries included in this survey, it can be seen that as indicators of the effectiveness of the occupational health and safety management system, companies most often monitor the number of incidents at work (86%), lost time due to injuries (76%) and the number of workers with occupational diseases (71%), and very rarely follows the number of deaths (12%) and the number of obese people among employees (22%). As indicators of the environmental protection management system, surveyed companies most often monitor the degree of reduction in electricity consumption (88%) and the index of greenhouse gas emissions (37%), and rarely monitor the degree of increase in green areas (26%). Based on the Kruskal Walliss test, it can be concluded that the country in which the company operates had no statistically significant influence on the distribution of responses regarding the application of the analyzed groups of efficiency indicators.

Key words: indicators of efficiency, environmental protection management system, occupational health and safety management system, food sector, Balkan countries

SI - 15

DEZINFEKCIJA BOLNIČKE SREDINE TOKOM KOVID PANDEMIJE: STUDIJA JEDNOG CENTRA

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Sažetak: Pojavom novog Korona virusa i proglašenjem kovid epidemije, Univerzitetski klinički centar Republike Srpske (UKC RS) se kao najveća zdravstvena ustanova susrela sa velikim izazovima, a jedan od njih je i dezinfekcija prostora, opreme i površina. Odabir sredstava nije bio jednostavan s obzirom na količine koje su bile neophodne kao i teškoće prilikom nabavke sredstava. Predstavićemo najčešće korištene metode dezinfekcije bolničke sredine tokom kovid pandemije, retrospektivnim pregledom baze podataka iz Odjeljenja za kontrolu sredine i prevenciju intrahospitalnih infekcija u UKC RS u periodu od početka 2020. godine do kraja 2022. godine. Za dekontaminaciju površina i prostora korištene su pumpe za dezinfekciju aerosolizacijom hlornim prepartima („prskalice“), obučeni su radnici za rukovanje i način provođenja ove vrste dezinfekcije pod nadzorom stručnih saradnika za sanitarne poslove. Postavljeni su i beskontaktni dozatori za dezinfekciju ruku alkoholnim preparatima na svim ulazima u zgrade i klinike. Za završnu dezinfekciju prostora, površina i opreme ultravioletnim zracima (UVC) korišten je “Steripro“ aparat („robot“), a za dezinfekciju vodonik peroksidom postupkom aerosolizacije korišten je „Cubic“ aparat. Izrađeni su protokoli za upotrebu novih aparata prema namjeni prostorija i opreme koji se tretiraju, kao i protokoli dekontaminacije i završne dezinfekcije. Izvršena je obuka osoblja za rukovanje aparatima i sačinjen plan rada. Završnoj dezinfekciji prethodilo je mehaničko čišćenje površina i prostora prema propisanim procedurama, uz poštovanje svih mjera prevencije infekcije u vrijeme COVID-19 epidemije. Dekontaminacija hlornim preparatima je efikasna mjera ukoliko se koristi racionalno i pod nadzorom stručnog osoblja. Završna dezinfekcija ultravioletnim zracima kao i vodonik peroksidom povećava sigurnost dezinfekcije bolničke sredine, skraćuje vrijeme procesa dezinfekcije te značajno utiče na smanjenje intrahospitalnih infekcija.

Ključne riječi: dekontaminacija**,** dezinfekcija, hlorni preparati, UVC-zraci, vodonik peroksid

DISINFECTION OF THE HOSPITAL ENVIRONMENT DURING THE COVID PANDEMIC: A SINGLE CENTER STUDY

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Apstract: With the emergence of the new Corona virus and the declaration of the covid epidemic, the University Clinical Center of the Republic of Srpska (UKC RS) as the largest health institution faced major challenges, and one of them is the disinfection of premises, equipment and surfaces. The selection of funds was not simple considering the quantities that were necessary as well as the difficulties in procuring the funds. We will present the most commonly used methods of disinfecting the hospital environment during the covid pandemic, with a retrospective review of the database from the Department for Environmental Control and Prevention of Intrahospital Infections at UKC RS in the period from the beginning of 2020 to the end of 2022. For the decontamination of surfaces and spaces, pumps for disinfection by aerosolization with chlorine preparations ("sprayers") were used, workers were trained in the handling and method of carrying out this type of disinfection under the supervision of expert associates for sanitary work. Contactless dispensers for disinfecting hands with alcohol preparations have also been installed at all entrances to buildings and clinics. The "Steripro" device ("robot") was used for the final disinfection of spaces, surfaces and equipment with ultraviolet rays (UVC), and the "Cubic" device was used for disinfection with hydrogen peroxide by the aerosolization process. Protocols for the use of new devices according to the purpose of the rooms and equipment to be treated, as well as protocols for decontamination and final disinfection were developed. The training of the staff in handling the devices was carried out and a work plan was drawn up. The final disinfection was preceded by mechanical cleaning of surfaces and spaces according to the prescribed procedures, in compliance with all infection prevention measures during the COVID-19 epidemic. Decontamination with chlorine preparations is an effective measure if used rationally and under the supervision of professional staff. Final disinfection with ultraviolet rays as well as hydrogen peroxide increases the safety of disinfection of the hospital environment, shortens the time of the disinfection process and significantly affects the reduction of intrahospital infections.

Keywords: decontamination, disinfection, chlorine preparations, UVC rays, hydrogen peroxide

SI - 16

IMAMO LI PREVIŠE BUKE U OBRAZOVNIM USTANOVAMA?

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Sažetak: Definicija buke je svaki neželjeni zvuk koji negativno utječe na naše blagostanje i zdravlje, kao i štetno djeluje na okoliš. U obrazovnim ustanovama buka je faktor rizika i za osoblje i za djecu, ali se često zanemaruje. Prekomjerni nivoi buke predstavljaju profesionalni rizik za nastavnike i ugrožavaju zdravlje učenika. Cilj je bio utvrditi nivoe buke kojoj su određeni nastavnici izloženi tokom rada u odabranoj osnovnoj školi. Mjerenja buke vršena su u skladu sa standardom SIST ISO 9612:2009. Korišten je mjerni instrument Brüel & Kjær 2260 Investigator. Mjerenja su obavljena u oktobru 2019. godine u odabranoj osnovnoj školi u pojedinim učionicama i drugim prostorijama škole. Buka je mjerena u praznim učionicama i u vrijeme održavanja nastave. Rezultati su pokazali, da je prekoračena granična vrijednost od 87 dB u holu škole (88,8 dB) i u menzi za vrijeme ručka (88,4 dB). Donja vrijednost upozorenja od 80 dB premašena je u muzičkoj učionici (82,4 dB) i teretani (82,6 dB). Upotreba elektronskog uha značajno je smanjila buku u trpezariji. Izloženost buci postala je jedan od najvažnijih faktora u određivanju kvaliteta života u zatvorenom prostoru. Prekomjerni nivoi buke tokom nastave, gdje nivoi buke konstantno variraju, mogu negativno uticati i na nastavnike i na učenike. Zato je važno suočiti se s problemom buke i svjesno djelovati. Predlažemo pregled prostorija sa stanovišta akustike, redovnu upotrebu elektronskih ušiju za upozoravanje na visok nivo buke i podizanje svijesti nastavnika, učenika i roditelja o štetnosti buke. Niži nivoi će dovesti do boljeg zdravlja i kvalitetnijeg obrazovanja.

Ključne riječi: buka, obrazovna ustanova, izloženost, profesionalni rizik

DO WE HAVE TOO MUCH NOISE IN EDUCATIONAL ESTABLISHMENTS?

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Abstract: The definition of noise is any unwanted sound that has a negative impact on our well-being and health, as well as having a harmful effect on the environment. In educational settings, noise is a risk factor for both staff and children, but it is often neglected. Excessive noise levels pose an occupational risk to teachers and endanger the health of pupils. The aim was to determine the noise levels to which certain teachers are exposed in the course of their work in a selected primary school. Noise measurements were carried out in accordance with SIST ISO 9612:2009. Brüel & Kjær 2260 Investigator is used in this reasrch. The measurements were carried out in October 2019 in a selected primary school in some classrooms and other areas of the school. The noise was measured in empty classrooms and when classes were in session. The results showed that the limit value of 87 dB was exceeded in the school lobby (88.8 dB) and in the lunchtime canteen (88.4 dB). The lower alert value of 80 dB was exceeded in the music classroom (82.4 dB) and the gym (82.6 dB). Using an electronic ear has significantly reduced noise in the dining room. Noise exposure has become one of the most important factors in the indoor quality of life. Excessive noise levels during lessons, where noise levels fluctuate constantly, can have a negative impact on both teachers and pupils. That is why it is important to face up to the noise problem and take conscious action. We suggest acoustic inspections, regular use of electronic ears to warn of high noise levels and raise awareness among teachers, pupils, and parents about the harmful effects of noise. Lower levels will lead to better health and also better quality education.

Keywords: noise, educational establishment, exposure, occupational risk

SI -17

POREĐENJE FUNGICIDNOG DEJSTVA EKSTRAKATA PROPOLISA I METRONIZADOLA

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Sažetak: Propolis je prirodna supstanca koja djeluje protuupalno (imunomodulirajuće i mikrobicidno) i ima dugu istoriju upotrebe u tradicionalnoj medicini.Cilj rada je bio da se ispitaju antifugalna svojstva 10% i 30% etanolnog ekstrakta propolisa pripremljenog na tradicionalan način i komercijalnog lijeka metronidazola prema odabranim sojevima *Candida albicans* izolovanih iz uzoraka hrane, referentnog soja *Candida albicans* WDCM 00054, referentnog soja *Aspergillus brasilliensis* WDCM 00053 i referentnog soja *Saccharomyces cerevisialis* WDCM 3058. Za ispitivanje fungicidnog dejstva propolisa i metronidazola na rast odabranih kultura korištena je agar difuziona metoda. Rezultati rada su pokazali da su obe ispitane koncentracije etanolnog ekstrakta propolisa porijeklom iz Republike Srpske djelovala fungicidno na izolate *Candida albicans* kao i na referentne sojeve *Candida albicans* WDMC 00054, *Aspergillus brasilliensis* WDCM 00053 i *Saccharomyces cerevisialis* WDCM 3058. Metronidazol je djelovao slabo antifugalno.

Ključne riječi: antifugalna aktivnost, propolis, *Candida albicans, Aspergillus brasilliensis, Saccharomyces cerevisialis*

COMPARISON OF FUNGICIDAL EFFECT OF PROPOLIS EXTRACTS AND METRONIDAZOLE

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Abstract: Propolis is a natural substance that has anti-inflammatory (immunomodulatory and microbicidal) properties and has a long history of use in traditional medicine.The aim of this study was to evaluate the antifungal properties of 10% and 30% ethanolic extract of propolis prepared traditionally and of a commercial drug metronidazole, against selected strains of *Candida albicans* isolated from food samples, reference strain *Candida albicans* WDCM 00054, reference strain *Aspergillus brasilliensis* WDCM 00053 and reference strain *Saccharomyces cerevisialis* WDCM 3058. The agar diffusion method was used to investigate the fungicidal effect of propolis and metronidazole on the growth of selected cultures. The results of the study showed that both tested concentrations of ethanolic extract of propolis originating from the Republic of Srpska acted fungicidally on the *Candida albicans* isolate as well as on the reference strains *Candida albicans* WDMC 00054, *Aspergillus brasilliensis* WDCM 00053 and *Saccharomyces cerevisialis* WDCM 3058. Metronidazole showed weak antifungal activity.

Key words: antifungal activity, propolis, *Candida albicans*, *Aspergillus brasilliensis, Saccharomyces cerevisialis*

MEDICINSKO-LABORATORIJSKO INŽENJERSTVO

MEDICAL LABORATORY ENGINEERING

MLI - 1

SAVREMENI TRENDOVI U UNAPREĐENJU SISTEMA UPRAVLJANJA KVALITETOM U HEMIJSKOJ LABORATORIJI

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Sažetak: Medicinske i kliničke laboratorije imaju važnu ulogu u sistemu zdravstvene zaštite stanovništa. Efikasnost ukupnog sistema i uspijeh u dostizanju postavljenih ciljeva zavise od sistema upravljanja kvalitetom u organizacijama čija djelatnost se odnosi na ispitivanje uzoraka materijala dobijenog iz ljudskog tijela. Važeći propisi su najčešće generičkog karaktera. Zahtjeve sistema upravljanja kvalitetom laboratorija treba prilagoditi uslovima i konkretnim radnim aktivnostima. Cilj ovog rada je da se prikažu zahtjevi standarda upravljanja kvalitetom i analizira mogućnost njihove primjene u hemijskoj laboratoriji u kojoj se obučavaju studenti medicinsko-laboratorijskog inženjerstva. U radu je dat pregled ključnih zahtjeva dva stadarda: ISO 9001 i ISO 15189. Standard ISO 9001 je namijenjen za certifikaciju laboratorija svih vrsta i veličina, uključujući i medicinsko-zdravstvene laboratorije). Standard ISO 15189, koji je baziran na Principima dobre laboratorijske prakse, namijenjen je za primjenu isključivo u medicinsko-zdravstvenim laboratorijama. Prema zahtjevima ISO 9001 ispunjenje svih zahtjeva treba rezultirati zadovoljstvom klijenata i potpunom usklađenosti sa propisima. Standard je zasnovan na određenim principima, međutim standard ne sadrži tehničke zahtjeve specifične za laboratorije. Sa druge strane standard ISO 15189 je fokusiran na tehničke zahtjeve za medicinsko-zdravstvene laboratorije, uključujući laboratorije za hemijska ispitivanja. Ovaj standard prilagođava zahtjeve ISO 17025 (standard namijenjen svim vrstama laboratorija za ispitivanje i kalibraciju) za primjenu medicinsko-zdravstvenim laboratorijama. Zahtjevi standarda ISO 15189 su komplementarni sa važećim propisima i značajno dopunjuju njihovu primjenu u praksi. Na osnovu analize važećih verzija standarda upravljanja kvalitetom, može se zaključiti da je za hemijske laboratorije poželjno da istovremeno implementiraju standarde ISO 9001 i ISO 15189 uz uvažavanje službenih propisa u ovoj oblasti.

Ključne riječi: Medicinsko-zdravstvene laboratorije. hemijska laboratorija. Sistem upravljanja kvalitetom. ISO 9001, ISO 15189

CONTEMPORARY TRENDS IN THE IMPROVEMENT OF QUALITY MANAGEMENT SYSTEMS IN CHEMICAL LABORATORIES

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Abstract: Medical and clinical laboratories play an important role in the public health care system. The efficiency of the overall system and the success in reaching the set goals depend on the quality management system in organizations whose activity is related to the examination of material samples from the human body. Current regulations are mostly of a generic nature. The requirements of the laboratory's quality management system should be adapted to the conditions and specific work activities. The aim of this paper is to present the requirements of quality management standards and analyze the possibility of their application in a chemical laboratory where medical laboratory engineering students are trained. The paper provides an overview of the key requirements of two standards: ISO 9001 and ISO 15189. The ISO 9001 standard is intended for the certification of organizations of all types and sizes, including medical and clinical laboratories. The ISO 15189 standard, which is based on the Principles of Good Laboratory Practice, is intended for use exclusively in medical and clinical laboratories. According to the requirements of ISO 9001, the fulfillment of all requirements should result in client satisfaction and full compliance with regulations. The standard is based on certain principles, however the standard does not contain technical requirements specific to laboratories. On the other hand, the ISO 15189 standard is focused on technical requirements for medical and clinical laboratories, including laboratories for chemical tests. This standard adapts the requirements of ISO 17025, which is intended for all types of testing and calibration laboratories, for application to medical and clinical laboratories. The requirements of the ISO 15189 standard are complementary to the current regulations and significantly supplement their application in practice. Based on the analysis of the valid versions of the quality management standards, it can be concluded that it is desirable for chemical laboratories to simultaneously implement the ISO 9001 and ISO 15189 standards while respecting the official regulations in this area.

Keywords: Medical and health laboratories. Chemical laboratory. Quality management system. ISO 9001, ISO 15189

MLI - 2

ZNAČAJ DOBRE LABORATORIJSKE PRAKSE U LABORATORIJAMA VISOKE MEDICINSKE ŠKOLE PRIJEDOR

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Sažetak: Kao dio službenih propisa, Dobra laboratorijska praksa (GLP) predstavlja standardizovani program za osiguranje kvaliteta i integritet podataka o nekliničkim ispitivanjima, koji se dostavljaju regulatornim nacionalnim ili međunarodnim tijelima. GLP propisi pokrivaju mnoge aspekte nekliničkih istraživanja. Zbog važnosti nekliničkih laboratorijskih ispitivanja zahtijeva da se ona provode u skladu sa naučno utemeljenim protokolima, sa posebnom pažnjom usmjerenom na kvalitet. Na osnovu OECD Principa dobre laboratorijske prakse, većina država u svijetu je usvojila vlastite Principe DLP. Prema nacionalnim propisima u većini država provode se redovni inspekciji nadzor i provjera podataka radi praćenja usklađenosti laboratorija sa zahtjevima GLP-a. Visoka medicinska škola u Prijedoru nabavila je i instalisala modernu opremu u tri laboratorije: hemijska laboratorija, biohemijska laboratorija i mikrobiološka laboratorija. Cilj ovog rada je analiza dokumentacije koju je neophodno razviti i usvojiti, kako bi laboratorija ispunila formalne uslove za obavljanje aktivnosti vezanih za nekliničke ispitivanja. Osim obuke studenata, rukovodstvo Visoke medicinske škole želi da se laboratorijama vrše određena nekliničke istraživanja, te da se osim principa Dobre laboratorijske prakse (GLP), u radu laboratorija stvore pretpostavke za prihvatanje principa Dobre kliničke laboratorijske prakse (GLCP). U radu se analiziraju zahtjevi OECD Principa dobre laboratorijske prakse, zahtjevi standarda ISO 15189 i zahtjevi Dobre kliničke laboratorijske prakse. Nakon tabelarnog pregleda i poređenja zahtjeva iz navedenih dokumenata, pojedinačno se analiziraju zahtjevi i prikazuju smjernice za ispunjenje zahtjeva u laboratorijama Visoke medicinske škole. Provedena analiza obuhvata detalje u vezi sa organizacijom i osobljem laboratorije, ciljevima programa osiguranja kvaliteta, sistemom ispitivanja (analiza, testiranja), odlaganjem otpada, opremom i mjernim instrumentima, reagensima i drugim potrošnim materijalima, prijemom i rukovanjem uzorcima, opisom i čuvanjem testnih i referentnih materijala, izradom standardnih operativnih procedura, izvođenjem ispitivanja, izvještavanjem o rezultatima ispitivanja, te o postupcima skladištenja i čuvanja zapisa. Provedeno istraživanje je rukovodstvu i osoblju laboratorija dalo smjernice u vezi narednih koraca ka ispunjenju zahtjeva Dobre laboratorijske prakse.

Ključne riječi: Dobra laboratorijska praksa, GLP, Medicinska laboratorija za obuku studenata

APPLICATION OF THE PRINCIPLES OF GOOD LABORATORY PRACTICE IN THE LABORATORIES OF THE COLLEGE OF HEALTH SCIENCE PRIJEDOR

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Abstract: As part of official regulations, Good Laboratory Practice (GLP) is a standardized program for ensuring the quality and integrity of data on non-clinical trials, which are submitted to regulatory national or international bodies. GLP regulations cover many aspects of non-clinical research. The importance of non-clinical laboratory tests requires that they are conducted in accordance with scientifically based protocols, with special attention focused on quality. Based on the OECD Principles of Good Laboratory Practice, most countries in the world have adopted their own GLP Principles. According to national regulations, regular inspections, supervision and data verification are carried out in most countries to monitor laboratory compliance with GLP requirements. The medical college in Prijedor has installed modern equipment in three laboratories: a chemical laboratory, a biochemical laboratory and a microbiological laboratory. In addition to training students, the management of the College of Health Sciences Prijedor wants the laboratories to carry out certain non-clinical research and, in addition to the principles of Good Laboratory Practice (GLP), create prerequisites for the acceptance of the principles of Good Clinical Laboratory Practice (GLCP) in the work of the laboratory. The paper analyzes the requirements of the OECD Principles of Good Laboratory Practice, the requirements of the ISO 15189 standard and the requirements of Good Clinical Laboratory Practice. After tabular review and comparison of the requirements from the mentioned documents, the requirements are analyzed individually and guidelines for fulfilling the requirements in the laboratories of the College of Medicine are presented. The analysis carried out includes details related to the organization and personnel of the laboratory, the objectives of the quality assurance program, the examination system (analysis, testing), waste disposal, equipment and measuring instruments, reagents and other consumables, receiving and handling of samples, description and storage of examination and reference materials, creating standard operating procedures, performing tests, reporting test results, and storage and record keeping procedures. The conducted research gave guidelines to the management and staff of the laboratory regarding the next steps towards fulfilling the requirements of Good Laboratory Practice.

Keywords: Good laboratory practice, GLP, Medical laboratory for student training

MLI - 3

MIKROBIOM ČOVEKA U ZDRAVLJU I BOLESTI

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Sažetak: Razvoj novih tehnika sekvenciranja genoma mikroorganizama i računarske biologije omogućio je revolucionarni napredak u upoznavanju mikrobioma čoveka, kao i njegove uloge u zdravlju i određenim patološkim procesima. Uobičajene i ustaljene mikrobne zajednice povezane su sa određenim delovima ljudskog tela, a najbrojniji i najuticajniji mikrobiom je onaj u digestivnom traktu. Ovaj mikrobiom obezbeđuje brojne metaboličke funkcije, ne dozvoljava kolonizaciju patogenim bakterijama i stvara signalne molekule koji upravljaju brojnim ćelijskim procesima i podstiču sazrevanje imunosti. Poremećaji broja, sastava i funkcija pojedinih mikrobioma jesu disbioze i one mogu da uzrokuju određene poremećaje zdravlja, kao što su gojaznost, maligniteti, dijabetes, gastroenterološki poremećaji, sepsa, kardiovaskularne bolesti, neurološki poremećaji, respiratorne bolesti i neželjeni ishodi porođaja. Dalje, funkcije uobičajenog mikrobioma značajno utiču na uspešno delovanje, permeabilnost, stabilnost i biodostupnost mnogih lekova i predstavljaju dodatni problem za lečenje nekih bolesti. U ovaj pregled najnovijih saznanja o mikrobiomu čoveka uključen je i prikaz uloge mikrobioma digestivnog trakta u nastanku otpornosti bakterijskih patogena na lekove, kao i najnovije otkriće uloge vaginalnog mikrobioma u prevremenom porođaju. Bolje poznavanje uzroka patoloških procesa povezanih sa mikrobiomom, kao i uloge pojedinih mikroorganizama specifičnih za određenu bolest pomaže u njihovoj dijagnostici i terapiji, kao i sprečavanju.

Ključne riječi: mikrobiom, bolest, digestivni trakt

THE HUMAN MICROBIOME IN HEALTH AND DISEASE

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Abstract: The development of new microorganism genome sequencing techniques and computational biology has enabled revolutionary progress in understanding the human microbiome, as well as its role in health and certain pathological processes. Common and established microbial communities are associated with certain parts of the human body, and the most numerous and influential microbiome is that of the digestive tract. This microbiome provides numerous metabolic functions, prevents colonization of pathogenic bacteria, and creates signaling molecules that govern numerous cellular processes and urge immune maturation. Disturbances in the number, composition and functions of certain microbiomes are dysbioses and they can cause certain health disorders, such as obesity, malignancies, diabetes, gastroenterological disorders, sepsis, cardiovascular diseases, neurological disorders, respiratory diseases and unwanted birth outcomes. Furthermore, the functions of the common microbiome significantly influence the successful action, permeability, stability and bioavailability of many drugs and represent an additional problem for the treatment of some diseases. In this review of the latest knowledge about the human microbiome, the role of the digestive tract microbiome in the development of drug resistance of bacterial pathogens is included, as well as the latest discovery of the role of the vaginal microbiome in premature birth. Better knowledge of the causes of pathological processes associated with the microbiome, as well as the role of certain microorganisms specific to a certain disease, helps in their diagnosis and therapy, as well as prevention.

Key words: microbiome, disease, digestive tract

MLI - 4

ISPITIVANJE UTICAJA HLADNE ATMOSFERSKE PLAZME NA PROTEINE GLUTENA IZ BEZGLUTENSKOG BRAŠNA GCE METODOM

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Sažetak: Prema *Codex Alimentariusu* proizvod se deklariše kao bezglutenski, ukoliko je sadržaj glutena <20 mg/kg. Cilj ovog rada je bio da se ispita uticaj hladne atmosferske plazme (CAP) na proteine glutena iz bezglutenskog brašna (sadržaj proteina 3,6 g/100 g). Uzorci su tretirani hladnom atmosferskom plazmom u čvrstom stanju (4 min) i kao ekstrakti (1 min) i upoređivani sa netretiranim uzorcima. Proteini glutena, glijadini su ekstrahovani 70% (v/v) etanolom, a glutenini 50% (v/v) 1-propanolom. Apsorbancija je izmjerena na 220 nm. Nakon elektroforetskog razdvajanja na GCE aparatu (Agilent CE 7100), ukupna količina proteina glijadina i glutenina, količina proteina unutar frakcija, kao i njihova relativna koncentracija je određena. Na osnovu dobijenih rezultata, nakon tretmana sa hladnom atmosferskom plazmom, najveća količina proteina glijadina je izdvojena iz netretiranih uzoraka i iznosi Xav=8,00, a najmanja iz uzoraka koji su tretirani kao ekstrakti i iznosi Xav=5,50. Kod glutenina, najveća količina proteina je izdvojena iz netretiranih uzoraka i iznosi Xav=6,67, a najmanja iz uzoraka koji su tretirani u čvrstom stanju i iznosi Xav=5,67.

Ključne riječi: gluten, bezglutensko brašno, hladna atmosferska plazma (CAP), GCE metoda

EXAMINATION OF THE EFFECT OF COLD ATMOSPHERIC PLASMA ON GLUTEN PROTEINS FROM GLUTEN-FREE FLOUR BY GCE METHOD

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Abstract: According to the *Codex Alimentarius*, a product is declared as gluten-free if it contains gluten <20 mg/kg. The aim of this paper was to examine the effect of cold atmospheric plasma (CAP) on gluten proteins from gluten-free flour (protein content 3.6 g/100 g). The samples were treated with cold atmospheric plasma in solid state (4 min) and as extracts (1 min) and compared with untreated samples. Gluten proteins, gliadin, was extracted with 70% (v/v) ethanol and glutenin with 50% (v/v) 1-propanol. The absorbance was read at 220 nm. After electrophoretic separation on a GCE apparatus (Agilent, CE, 7100), the total amount of gliadin and glutenin proteins, the amount of protein within the fractions and their relative concentration were determined. Based on the obtained results, after treatment with cold atmospheric plasma, the highest amount of gliadin proteins was isolated from untreated samples and amounted to Xav=8.00 and the lowest from samples that were treated as extracts and amounted to Xav=5.50. In the case of glutenin proteins, the highest amount of protein was isolated from untreated samples and amounted to Xav=6.67, and the lowest amount from samples that were treated in solid state and amounted to Xav=5.67.

Keywords: gluten, gluten-free flour, cold atmospheric plasma (CAP), GCE method

MLI - 5

RIJETKE RHD VARIJANTE KOD DAVALACA KRVI

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Sažetak: Poslednjih decenija molekularno određivanje krvnih grupa, posebno unutar Rh sistema, značajno se proširilo. Različite varijante RH gena kod davalaca krvi, kada nisu otkrivene, mogu uzrokovati aloimunizaciju kod RhD-negativnih primalaca. Cilj istraživanja bio je otkriti karakteristične molekularne mehanizme RhD-negativnog fenotipa kod davalaca krvi. DNK je izolovana od 600 serološki RhD-negativnih nesrodnih davalaca krvi sa C+ i/ili E+ koji rutinski daju krv u Zavodu za transfuzijsku medicinu Republike Srpske. Molekularno testiranje je uključivalo početni skrining za RHD gen, skeniranje RHD eksona, određivanje klinički najrelevantnijih slabih RHD alela. Korišteni FluoGene testovi zasnovani su na PCR-SSP (prajmeri specifični za PCR sekvencu) sa evaluacijom rezultata očitavanjem fluorescencije na instrumentu FluoVista (Inno-train Diagnostik). Svi uzorci sa RHD varijantom su naknadno ispitani tehnikom adsorpcije/elucije (humani anti-D – u "in house" proizvodnji, elucija urađena DiaCidel kitom za kiselu eluciju (Bio-Rad Laboratories) kako bi se potvrdila ili odbacila DEL ekspresija dotičnog RHD alela. Kod 5/600 (0,83%) davalaca krvi utvrđena su ukupno tri različita RHD alela – RHD*01N.03, RHD*01EL.44 (RHD*DEL44) i RHD*05.05 (RHD*DV.5). Četiri davaoca sa rijetkim hibridnim alelima (RHD*01N.03 i RHD*01EL.44) su naknadno potvrđeni kao RhD-pozitivni adsorpcijom/elucijom, čime je potvrđena ekspresija DEL fenotipa ovih alela. Oba alela se obično tumače kao da imaju RhD-negativnu ekspresiju. Alel RHD*01N.03 ima strukturu RHD*D-CE(2-9)-D, što sugerira da bi se tipično trebao ponašati kao nulti alel. Iako je RHD*DEL44 zapravo katalogiziran kao alel DEL od strane ISBT, njegov DEL fenotip potvrđen je tek izvorno u Kini, a tek nedavno u Hrvatskoj. Naši rezultati pokazuju potrebu za molekularnom tipizacijom RhD-negativnog fenotipa kod C+ i/ili E+ davalaca krvi. Posebno je za hibridne alele imperativ da se utvrdi da li oni eksprimiraju RhD antigen, a ne da se podrazumjevano preuzme njegov RhD-negativni fenotip na osnovu serološkog nalaza, s obzirom na mogućnost aloimunizacije RhD-negativnih primalaca.

Ključne riječi: molekularna tipizacija, serološki RhD-negativni fenotipovi

RARE *RHD* VARIANTS IN BLOOD DONORS

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Abstract: In the last decades molecular determination of blood groups, particularly within the Rh system has expanded considerably. Different variants of RH genes in donors when undetected can cause alloimmunisation in RhD-negative recipients.The aim of the study was to detect distinctive molecular mechanisms for RhD negative phenotype within donors.DNA was isolated from 600 serologically RhD-negative unrelated blood donors with C+ and/or E+ who routinely donate blood at Institute for transfusion medicine of Republika Srpska. Molecular testing included initial screening for *RHD*, *RHD* exon scanning, determination of clinically most relevant weak *RHD* alleles. The FluoGene assays used are based on PCR-SSP (PCR-sequence specific primers) with the results evaluation by fluorescence reading on the FluoVista instrument (*Inno-train Diagnostik*). All the samples with an *RHD* variant were subsequently examined by adsorption/elution technique (human anti-D – in house production, eluted by DiaCidel solution for acid elution, *Bio-Rad Laboratories*) in order to confirm or dismiss the DEL expression of the respective *RHD* allele. In 5/600 (0,83%) donors in total three different *RHD* alleles were determined – *RHD*01N.03*, *RHD*01EL.44* (*RHD*DEL44*) and *RHD*05.05* (*RHD*DV.5*).Four donors with the rare hybrid alleles (*RHD*01N.03* and *RHD*01EL.44*) were afterwards confirmed as RhD-positive by adsorption/elution, thus confirming the DEL phenotype expression of these alleles. Both alleles are commonly interpreted as having an RhD negative expression. The *RHD*01N.03* allele has a structure of *RHD*D-CE(2-9)-D*, which suggests it should typically behave as a null allele. Although *RHD*DEL44* is actually catalogued as the DEL allele by ISBT, its DEL phenotype was confirmed only originally in China and just recently in Croatia.Our results demonstrate the need for molecular clarification of RhD-negative phenotype in C+ and/or E+ donors. Especially for hybrid alleles it is imperative to determine whether they express the RhD antigen and not to assume its RhD negative phenotype by default, considering the possibility of alloimmunisation in the RhD negative recipients.

Key words: molecular testing, serologically RhD-negative phenotypes

MLI - 6

INCIDENCIJA *CLOSTRIDIUM DIFFICILE* INFEKCIJA KOD PACIJENATA SA DIJAREJOM U BOLNICI ZA TERCIJARNU NJEGU

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Sažetak: *Clostridium difficile* infekcija (CDI) jedna je od najčešćih infekcija povezanih sa zdravstvenom njegom. Postavljanje tačne dijagnoze CDI, osim za pacijenta važna je za kontrolu širenja infekcije, a i preduslov je za prikupljanje pouzdanih podataka nadzora, kako bi se infekcije mogle pratiti, porediti i procjenjivati efikasnosti intervencija. Sprovedena je retrospektivna studija kako bi se utvrdila incidencija *C.difficile* kod pacijenata sa anamnezom prethodne hospitalizacije i/ili liječenja antibioticima koji su razvili dijareju u bolnici za tercijarnu njegu. Etiološka dijagnoza CDI je postavljana imunohromatografski brzim testom za kvalitativnu detekciju antigena na toksina A i toksina B iz uzoraka stolice pomoću VEDA LAB Toxin A+B (*Clostridium difficile*). Zbog upoređivanja varijabli koje su mogle da doprinesu razlikama učestalosti CDI, uzeli su se i klinički podaci o pacijentima. Tokom petogodišnjeg perioda nadzora, stopa incidencije je iznosila 3,5 slučajeva na 10.000 pacijent-dana. Ukupno je laboratorijski testirano 4.311 uzorak stolice za dokazivanje antigen pozitivnih na *C.difficile*. Pozitivnih uzoraka na toksin A i/ili B je bilo 471 (11,4%), dok kod 3.820 (88,6%) nije CDI laboratorijski potvrđena. Primjećena je dominacija toksina A *C.difficile* u odnosu na toksin B odnosno toksin AB ($p < 0,001$). Najveći broj slučajeva pozitivnih na toksin *C.difficile* bio je iz uzoraka stolice pacijenata hospitalizovanih na Klinici za unutrašnje bolesti, a zatim na Klinici za infektivne bolesti. Od ukupnog broja CDI slučajeva, kod 430 (87,6%) pacijenata radilo se o bolničkoj infekciji, a ponovljena CDI je zabilježena kod 34 (6,9%) pacijenata. CDI je najvažniji uzročnik bolničke dijareje, a pravovremeni laboratorijski rezultati testiranja na *C.difficile* mogu da utiču na odluke u vezi sa antibiotskom terapijom i mjerama kontrole infekcije. Zbog velikog broja negativnih rezultata, za dokazivanje *C.difficile* u stolici nemogu da se samo koriste imunski testovi. Neophodno je poboljšavati referentne metode za laboratorijsku dijagnostiku *C.difficile*.

Ključne riječi: *Clostridium difficile* infekcija, epidemiološki nadzor, laboratorijski testovi

INCIDENCE OF *CLOSTRIDIUM DIFFICILE* INFECTION IN PATIENTS WITH DIARRHEA IN A TERTIARY CARE HOSPITAL

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Apstract: *Clostridium difficile* infection (CDI) is one of the most common healthcare-associated infections. Establishing an accurate diagnosis of CDI, apart from the patient, is important for controlling the spread of infection and is a prerequisite for collecting reliable surveillance data, so that infections can be monitored, compared and the effectiveness of interventions evaluated. A retrospective study was conducted to determine the incidence of *C. difficile* in patients with a history of prior hospitalization and/or antibiotic treatment who developed diarrhoea in a tertiary care hospital. The etiological diagnosis of CDI was established by an immunochromatographic rapid test for the qualitative detection of toxin A and toxin B antigens from stool samples using VEDA LAB Toxin A+B (*Clostridium difficile*). Because of the comparison of variables that could have contributed to the differences in CDI incidence, clinical data on patients were also taken. During the five-year surveillance period, the incidence rate was 3.5 cases per 10,000 patient-days. A total of 4,311 stool samples were laboratory tested to prove antigen positive for *C. difficile*. There were 471 (11.4%) positive samples for toxin A and/or B, while CDI was not laboratory confirmed in 3,820 (88.6%). The dominance of *C. difficile* toxin A over toxin B or toxin AB was observed ($p < 0.001$). The largest number of cases positive for *C. difficile* toxin were from stool samples of patients hospitalized at the Internal Medicine Clinic, and then at the Infectious Diseases Clinic. Of the total number of CDI cases, in 430 (87.6%) patients it was a nosocomial infection, and repeated CDI was recorded in 34 (6.9%) patients. CDI is the most important cause of nosocomial diarrhoea, and timely laboratory results of *C. difficile* testing can influence decisions regarding antibiotic therapy and infection control measures. Due to the large number of negative results, immunoassays alone cannot be used to prove *C. difficile* in the stool. It is necessary to improve reference methods for laboratory diagnostics of *C. difficile*.

Keywords: *Clostridium difficile* infection, epidemiological surveillance, laboratory tests

MLI – 7

EFIKASNOST BIOCIDA U ERADIKACIJI *ACINETOBACTER BAUMANNII* BIOFILMA

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Sažetak: Produkcija biofilma je veoma značajan faktor virulencije bakterija, koji dodatno doprinosi rezistenciji na antibiotike i omogućava im preživljavanje nepovoljnih uslova. *Acinetobacter baumannii* je odličan produktor biofilma, koji predstavlja veliki izazov u terapiji intrahospitalnih infekcija, jer mu omogućava preživljavanje u bolničkoj sredini. Cilj rada je bio da se uporedi dejstvo različitih biocida na uklanjanje zrelog, formiranog biofilma koji su produkovali *A. baumannii* klinički izolati. U ovoj studiji je ispitana sposobnost produkcije biofilma kod 30 *A. baumannii* kliničkih izolata, metodom po Stepanoviću i saradnicima u mikrotitarskoj ploči sa bojenjem formiranog biofilma pomoću biološke boje gencijana ljubičasta. Sojevi su bili klasifikovani kao neproduktori, slabi, umjereni i jaki produktori na osnovu adsorbance gencijana ljubičasta boje mjerene pomoću spektorfotometra. Nakon toga je isprodukovani biofilm bio tretiran 10 minuta sa komercijalno dostupnim biocidima različitog sastava (1% natrijum hipohlorit-varikina, 70% alkohol i ekološki dezinficijens marke "Frosch"). Od ukupno 30 testiranih izolata, 5 izolata nisu isprodukovali biofilm, po 10 izolata su bili slabi i jaki produktori, a 5 izolata su klasifikovani kao umjereni produktori. Nakon dejstva sva tri dezinficijensa došlo je do značajne eradikacije biofilma, jer nakon tretmana sa sva tri biocida najveći broj sojeva prešao u neproduktore i slabe produktore biofilma ($p<0,001$, $p=0,01$, $p=0,04$). Najveći stepen uklanjanja biofilma utvrđen kod varikine (biofilm uklonjen u potpunosti kod svih izolata), dok su alkohol i ekološki dezinficijens podjednako djelovali (uklonili su biofilm kod 46%, odnosno kod 53% izolata). Na osnovu dobijenih rezultata možemo preporučiti varikinu kao najbolje sredstvo za uklanjanje produkovanog biofilma, pri čemu je veoma važno da se ostvari dužina kontakta između površine i biocida od 10 minuta.

Ključne riječi: biocidi, biofilm, *Acinetobacter baumannii*

THE POTENTIAL OF DIFFERENT BIOCIDES IN ERADICATION OF MATURE *ACINETOBACTER BAUMANNII* BIOFILM

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Apstract: Biofilm production is an important bacterial virulence factor, which contributes to bacterial resistance mechanisms to antibiotics and enables them to survive adverse conditions. *Acinetobacter baumannii* is an excellent biofilm producer and it represents a great challenge in the treatment of hospital infections, because it facilitates bacterial survival in the hospital environment. Aim of this study was to compare the efficacy of three different biocides in eradication of mature, performed *A. baumannii* biofilm. Biofilm production of 30 clinical isolates of *A. baumannii* was performed by method of Stepanovic *et al*. Strains were classified as biofilm-non producers or weak, moderate and strong biofilm producers according to OD of crystal violet dye, measured by spectrophotometer. Afterwards, mature biofilm was treated for 10 minutes with different comercially available biocides, such as 1% of sodium hypochlorite (bleach), 70% alcohol and ecological disinfectant "Frosch". Out of a total of 30 isolates tested, 5 isolates did not produce biofilm, 20 isolates were weak and strong producers (10 isolates in both groups), and 5 isolates were classified as moderate producers. There was a significant eradication of biofilm in tested isolates after the treatment of all three disinfectants. After treatment the majority of isolates became non- biofilm producers and weak biofilm producers ($p<0.001$, $p=0.01$, $p=0.04$). The best effect in biofilm removal was found with bleach (biofilm removed completely in all isolates), while alcohol and environmental-friendly disinfectant were equally effective (they removed biofilm in 46% and 53% of isolates, respectively). Based on the obtained results, we can recommend bleach as the best biocide for removing the mature biofilm. Also it should be emphasised that is very important to achieve a contact period of 10 minutes between the surface and the biocide.

Key words: biocides, biofilm, *Acinetobacter baumannii*

STUDENTSKI RADOVI

STUDENT PAPERS

SR - 1

REHABILITACIJA BOLESNIKA NAKON AKUTNOG INFARKTA MIOKARDA

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Sažetak: Akutni infarkt miokarda (AIM), kao najteži oblik ispoljavanja ishemijske bolesti srca, nalazi se na vrhu morbiditeta i mortaliteta u mnogim zemljama svijeta. Odsustvo bola i stabilan arterijski pritisak u poslednja 24 sata, završena evolucija akutnog infarkta miokarda, odsustvo znakova zatajenja srca, odsustvo poremećaja srčanog ritma i odsustvo embolijskih komplikacija su uslovi za početak programirane rehabilitacije. Opšte kontraindikacije su hipertenzija ≥200/120 mmHg, hipotenzija ≤90/60mmHg, tahikardija ≥120/min, bradikardija ≤50/min, febrilnost ≥ 38^{o} C, hitno liječenje – uključujući transfuziju krvi ili plazme. Specifične kontraindikacije su nestabilna angina pektoris, dekompenzacija srca, akutni miokarditis i perikarditis, poremećaji srčanog ritma. Osnovni ciljevi rehabilitacije su fizička, psihološka i socijalna rehabilitacija. Cilj rada je da se pregledom naučne literature prikaže proces rehabilitacije bolesnika poslije AIM. Proces medicinske rehabilitacije kod AIM je podjeljen u tri faze. Prva faza je faza hospitalizacije – prva dva dana mirovanje, zatim 3-4 dana vježbe disanja, pasivni pokreti tokom njege, aktivni pokreti stopala i ruku, sjedenje, okretanje u krevetu, četkanje i frotiranje tokom njege, aktivni pokreti gornjih i donjih ekstremiteta, vježbe za pojas i sjedenje na ivici kreveta; nakon 7-9 dana modifikovani Schelling test, a 10. dan aktivnosti unutar i izvan bolničke zgrade – hodanje hodnikom, spuštanje niz stepenice, hodanje uz stepenice i slično; druga faza je faza rekonvalescencije koja traje 3-5 nedjelja: gimnastičke vježbe, rekreacija, plivanje, sprotske igre (stoni tenis, kuglanje, badminton). Treća faza je faza nakon rekonvalescencije – dozvoljeno je trenirati dva do tri puta sedmično po 30 minuta. Rana rehabilitacija pacijenata nakon akutnog infarkta miokarda, koja se izvodi prema kardiološko-fiziološkoj doktorini, treba da bude obavezna i programirana u svakoj koronarnoj jedinici od drugog dana nakon akutnog infarkta u skladu sa normama koje su usvojili brojni istraživači u ovoj oblasti, kako bi se obezbjedio najbolji mogući kvalitet života i povratak u zajednicu uz nastavak aktivnog života.

Ključne riječi: faze rehabilitacije, indikacije, kontraindikacije

REHABILITATION OF PATIENTS AFTER ACUTE MYOCARDIAL INFARCTION

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Abstract: Acute myocardial infarction (AMI), as the most severe form of ischemic heart disease, is at the top of morbidity and mortality in many countries of the world. Absence of pain and stable arterial pressure in the last 24 hours, completed evolution of acute myocardial infarction, absence of signs of heart failure, absence of heart rhythm disorders and absence of embolic complications are conditions for the start of programmed rehabilitation. General contraindications are hypertension ≥200/120 mmHg, hypotension ≤90/60mmHg, tachycardia ≥120/min, bradycardia ≤50/min, fever ≥38 ^{o} C, emergency treatment - including blood or plasma transfusion. Specific contraindications are unstable angina pectoris, heart decompensation, acute myocarditis and pericarditis, heart rhythm disorders. The main goals of rehabilitation are physical, psychological and social rehabilitation. The aim of the paper is to present the process of rehabilitation of patients after AMI by reviewing the scientific literature. The process of medical rehabilitation in AMI is divided into three phases. The first phase is the hospitalization phase - the first two days of rest, then 3-4 days of breathing exercises, passive movements during care, active movements of the feet and hands, sitting, turning in bed, brushing and terrying during care, active movements of the upper and lower extremities, exercises for the belt and sitting on the edge of the bed; after 7-9 days a modified Schelling test, and on the 10th day activities inside and outside the hospital building - walking in the corridor, going down the stairs, walking up the stairs and similar; the second phase is the convalescence phase that lasts 3-5 weeks: gymnastic exercises, recreation, swimming, sports games (table tennis, bowling, badminton). The third phase is the phase after convalescence - it is allowed to train two to three times a week for 30 minutes. Early rehabilitation of patients after an acute myocardial infarction, which is performed according to a cardiology-physiology doctorate, should be mandatory and programmed in every coronary unit from the second day after an acute infarction in accordance with the norms adopted by numerous researchers in this field, in order to ensure the best possible quality of life and return to the community while continuing an active life.

Key words: phases of rehabilitation, indications, contraindications

SR-2

INKLUZIJA INVALIDNIH OSOBA U DRUŠTVO

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Sažetak: Socijalna inkluzija se odnosi na uključivanje osoba sa invaliditetom u društvo i sve društvene tokove. Po principu poštovanja ljudskih prava, inkluzija se orijentiše na povećanje učešća invalidnih osoba u školstvu, javnim institucijama, lokalnim zajednicama i drugim ustanovama odgovornim za sve građane. Prema rezultatima poslednjeg popisa stanovništva iz 2013. godine procijenjuje se da je u Republici Srpskoj bilo ukupno 102.262 lica sa invaliditetom ili 8.7% od ukupnog broja stanovnika što je približno procjeni UN-a da u svijetskom stanovništvu ima oko 10% lica sa invaliditetom. Osobe sa invaliditetom su kroz istoriju bile izložene jakoj diskriminaciji i segregaciji iz društva. Danas još uvijek prava invalidnih osoba nisu zadovoljena zbog stigmatizacije ili nezainteresovanosti institucija za prava ovih osoba. Time se sprečava njihov razvoj i doprinos društvenoj zajednici. Na Generalnoj skupštini UN-a, 2006 godine donesena je „Konvencija o pravima osoba sa invaliditetom“ koja garantuje jednaka prava osobama sa invaliditetom. Ova konvencija ne daje definiciju invaliditeta, već umjesto toga pruža širok opis inkluzije osoba sa invaliditetom u društvo. Nacije, a i pojedinci koji nisu zainteresovani za sreću i blagostanje drugih naroda ili pojedinaca nemaju perspektivu u modernom društvu. Neke razvijene zemlje imaju visok nivo svijesti o važnosti uključivanja osoba sa invaliditetom u društvo. Sistem socijalne zaštite nerijetko je jedini izvor pomoći osobama s invaliditetom, iako bi trebao biti krajnji. Prije ostvarivanja određenog prava, osoba mora proći kroz proces vještačenja kako bi se utvrdilo može li joj se određeno pravo dodijeliti. Cilj je da se pojača djelovanje institucija na polju invaliditeta i obezbijedi dostojanstven život osoba sa invaliditetom.

Ključne riječi: inkluzija, segregacija, stigmatizacija, diskriminacija, simedonija

INCLUSION OF DISABLED PERSONS IN SOCIETY

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Abstract: Social inclusion refers to the inclusion of persons with disabilities in society and all social flows. According to the principle of respect for human rights, inclusion is oriented towards increasing the participation of disabled people in education, public institutions, local communities and other institutions responsible for all citizens. According to the results of the last population census from 2013, it is estimated that in the Republic of Srpska, there were a total of 102,262 persons with disabilities or 8.7% of the total population, which is approximately according to the UN estimate that there are about 10% of people with disabilities in the world's population. Persons with disabilities throughout history have been exposed to strong discrimination and segregation from society. Today still the rights of the disabled persons are not satisfied due to stigmatization or lack of interest of institutions in the rights of these persons. That's it prevents their development and contribution to the social community. At the UN General Assembly, 2006 the "Convention on the Rights of Persons with Disabilities" was adopted, which guarantees equal rights to persons with disabilities. This convention does not provide a definition of disability, but instead provides a broad description of inclusion of persons with disabilities into society. Nations, and also individuals who are not interested in happiness and well-being of other nations or individuals have no perspective in modern society. Some developed countries have high level of awareness of the importance of including people with disabilities in society. The social protection system is usually the only source of help for people with disabilities, although it should be the last one. Before achieving certain rights, the person must go through the process of expertise in order to determine whether they can be granted a right to assign. The goal is to strengthen the activities of institutions in the field disability and ensures a dignified life for persons with disabilities.

Key words: inclusion, segregation, stigmatization, discrimination, simedonia

SR-3

RIZIKO FAKTORI NA KOJE MOŽEMO UTICATI

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Sažetak: Pod pojmom riziko faktori, u medicini, podrazumijevaju se sve moguće potencijalne prijetnje i opasnosti koje narušavaju i ugrožavaju zdravstveno stanje pojedinca i populacije. Različito se klasificiraju i različito ispoljavaju svoje dejstvo. Međutim, najvažnija klasifikacija riziko faktora je na promjenjive i nepromjenjive. Promjenjivi su oni na koje osoba može djelovati, uticati i kontrolirati ih, dok su nepromjenjivi oni na koje pojedinac ne može puno uticati niti ih može izmijeniti. Najčešći promjenjivi riziko faktori, na koje svaki savjestan i razuman pojedinac može uticati su: fizička (ne) aktivnost, prehrana i prehrambene navike, cigarete, alkohol, zadržavanje i boravak u okruženju koje ima loš uticaj na nas. Cilj ovog rada je navesti najčešće promjenjive riziko faktore i opisati načine pomoću kojih se uspješno mogu izbjeći ili tretirati i održavati u fiziološkim granicama. Epidemiologija i etiologija većine dijagnosticiranih oboljenja, zasnovane su i bilježe uticaj i prisustvo, isključivo promjenjivih riziko faktora. Većina savjeta i preporuka ljekara, također su koncipirani i neizostavno naglašavaju važnost prepoznavanja i uticanja na sve ono što je moguće promijeniti. Kao što su na primjer: redovna fizička aktivnost (pješačenje, trčanje, vožnja bicikla, treniranje), poboljšanje prehrambenih navika i umjerena konzumacija hrane, izbjegavanje nezdravih namirnica i pića, prestanak pušenja, prestanak konzumiranja alkohola ili opojnih sredstava, što manja izloženost stresu i slično. Brigom ili nemarom o sebi, čovjek najviše može pomoći ili naštetiti sam sebi.

Ključne riječi: promjenjivi riziko faktori, briga o sebi

RISK FACTORS THAT WE CAN INFLUENCE

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Abstract: The term risk factors, in medicine, refers to all possible potential threats and dangers that impair and threaten the health status of individuals and the population. They are classified differently and manifest their effects differently. However, the most important classification of risk factors is into variable and non-variable. Variables are those that a person can act on, influence and control, while immutable are those that an individual cannot greatly influence or change. The most common changeable risk factors, which every conscientious and reasonable individual can influence are: physical (non) activity, diet and eating habits, cigarettes, alcohol, staying in an environment that has a bad effect on us. The aim of this paper is to list the most frequently changing risk factors and to describe the ways in which they can be successfully avoided or treated and maintained within physiological limits. The epidemiology and etiology of most diagnosed diseases are based on and record the influence and presence of exclusively variable risk factors. Most of the doctor's advice and recommendations are also designed and unfailingly emphasize the importance of recognizing and influencing everything that can be changed. Such as, for example: regular physical activity (walking, running, cycling, training), improving eating habits and moderate food consumption, avoiding unhealthy foods and drinks, stopping smoking, stopping the consumption of alcohol or intoxicants, minimizing exposure to stress etc. By caring or neglecting oneself, a person can help or harm themself the most.

Key words: modifiable risk factors, self-care

SR -4

PREVENCIJA NA NIVOU PRIMARNE ZDRAVSTVENE ZAŠTITE

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Sažetak: Pojam prevencija potiče od latinske riječi „Praevenire", što znači sprečavanje. U punom smislu riječi, prevencija označava skup mjera i postupaka pomoću kojih se otkrivaju neželjene pojave i promjene, koje imaju negativan uticaj i negativne posljedice, kako na pojedinca tako i na cjelokupnu populaciju. Prevencija se najčešće dijeli na: primarnu, sekundarnu i tercijarnu. Najvažnija je primarna prevencija jer se provodi kod asimptomatskih i naizgled zdravih ljudi, s ciljem očuvanja i poboljšanja kvaliteta njihovog zdravstvenog stanja. Sekundarna prevencija provodi se kada su već prisutni simptomi određenih oboljenja, dok se tercijarna prevencija provodi onda kada su prisutni uznapredovali stadiji i komplikacije određenih oboljenja. Cilj ovog rada je prikazati značaj prevencije na primarnom nivou zdravstvene zaštite, te njen efikasan uticaj na proces izlječenja različitih oboljenja. Primarna zdravstvena zaštita predstavlja temelj zdravstvene zaštite, polazište je i prvi kontakt pacijenata sa zdravstvenim sistemom općenito. Rješava najveći dio zdravstvenih problema i potreba stanovništva, uz aktivnu podršku pojedinaca, porodice i zajednice u cjelini. Organizuje i usavršava angažman osnovnih i specijalističkih resursa, usmjerenih ka promociji, održavanju i unapređenju zdravlja. Promotivnim, preventivnim, kurativnim i rehabilitacijskim uslugama – educira stanovništvo, prepoznaje i rješava uobičajene zdravstvene probleme. Sve s ciljem očuvanja i poboljšanja zdravstvenog stanja i kvaliteta života stanovništva. Zahvaljujući preventivnim aktivnostima koje se provode na nivou primarne zdravstvene zaštite, moguće je uspješno izbjeći iznimno visoke troškove liječenja, ali i progrediranje komplikacija određenih zdravstvenih stanja. Neke od takvih aktivnosti bile bi: nadzor i liječenje zubnog karijesa kod djece predškolskog i školskog uzrasta, pregled stopala učenika osnovnih i srednjih škola te uočavanje i preporuke za liječenje deformiteta kičmenog stuba, savjetovanje pacijenata u kućnim posjetama i slično. Zdravlje bi trebalo posmatrati kao multifaktorijalnu komponentu, na primjer: kao ekonomski potencijal, kao dio ljudskog kapitala, te kao sredstvo povećanja produktivnosti i smanjenja javnih troškova liječenja. Zdravo stanovništvo je produktivnije, radi bolje, proizvodi i doprinosi više.

Ključne riječi: edukacija, briga o zdravlju, promocija

PREVENTION AT THE LEVEL OF PRIMARY HEALTH CARE

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Abstract: The term prevention comes from the Latin word "Praevenire", which means prevention. In the full sense of the word, prevention means a set of measures and procedures by means of which unwanted phenomena and changes are detected, which have a negative impact and negative consequences, both on the individual and on the entire population. Prevention is usually divided into: primary, secondary and tertiary. Primary prevention is the most important because it is carried out in asymptomatic and apparently healthy people, with the aim of preserving and improving the quality of their health condition. Secondary prevention is carried out when symptoms of certain diseases are already present, while tertiary prevention is carried out when advanced stages and complications of certain diseases are present. The aim of this paper is to show the importance of prevention at the primary level of health care, and its effective influence on the process of curing various diseases. Primary health care represents the foundation of health care, it is the starting point and the first contact of patients with the health system in general. It solves most of the health problems and needs of the population, with the active support of individuals, families and the community as a whole. It organizes and perfects the engagement of basic and specialist resources, aimed at the promotion, maintenance and improvement of health. Promotional, preventive, curative and rehabilitation services - educates the population, recognizes and solves common health problems. All with the aim of preserving and improving the health condition and quality of life of the population. Thanks to preventive activities carried out at the level of primary health care, it is possible to successfully avoid extremely high treatment costs, as well as the progression of complications of certain health conditions. Some of such activities would be: monitoring and treatment of dental caries in children of preschool and school age, examination of the feet of primary and secondary school students and observation and recommendations for the treatment of spinal deformities, counseling patients in home visits and similar. Health should be viewed as a multifactorial component, for example: as economic potential, as part of human capital, and as a means of increasing productivity and reducing public treatment costs. A healthy population is more productive, works better, produces and contributes more.

Key words: education, health care, promotion

SR - 5

TRADICIONALNA UPOTREBA *CANNABIS SATIVA L.* NA BALKANU

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Sažetak: *Cannabis sativa L*. jedna je od najsvestranijih biljaka, koju su ljudi koristili hiljadama godina zbog njenih ljekovitih svojstava, jakih vlakana, hranljivih sjemenki i psihoaktivne smole. Uprkos činjenici da canabis ima izuzetno raznovrsnu upotrebu, trenutno većina studija istražuje samo hemijski sastav sekundarnih metabolita ženskih cvasti canabisa i njihova ljekovita svojstva. Glavni cilj našeg istraživanja bio je analiziranje dostupnih podataka o tradicionalnoj upotrebi canabisa na Balkanskom poluostrvu. Nadalje, željeli smo provjeriti da li postoje veze između pojedinih dijelova biljke i njihove upotrebe, i ako postoje, u kojoj mjeri su povezane. Literatura je prikupljena iz online baza podataka (Scopus, Google Scholar, Cobiss) i digitalnih biblioteka. Naša pretraga je rezultirala sa 24 publikacije koje su zadovoljile naše kriterije. Najviše publikacija pronađeno je za Hrvatsku, a najmanje za Kosovo i Sloveniju. Analiza je pokazala da se tradicionalna upotreba canabisa razlikuje od države do države. Prema našem pregledu, najčešće tradicionalne upotrebe canabisa na Balkanskom poluostrvu bile su za proizvodnju vlakana, u medicinske svrhe i za prehranu. Pronašli smo vrlo malo podataka u psihoaktivne svrhe. Rezultati su pokazali da su najčešće korišteni dijelovi biljke sjemenke, stabljike i vlakna, dok su ostali dijelovi biljke poput listova, cvasti i korijena rijetko korišteni. Svi prikupljeni podaci o tradicionalnoj upotrebi canabisa na Balkanskom poluostrvu biće uključeni u CANNUSE-bazu podataka o tradicionalnim upotrebama canabisa (http://cannusedb.csic.es) i na taj način biti dostupni široj javnosti.

Ključne riječi: *Cannabis sativa* L., konoplja, etnobotanika, tradicionalna upotreba, Balkan

TRADITIONAL USE OF HEMP (*Cannabis sativa* L.) IN THE BALKANS

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Abstract: Hemp (*Cannabis sativa L*.) is one of the most versatile plants, and has been used by humans for thousands of years for its medicinal properties, strong fiber, nutritious seeds, and psychoactive resin. Despite the fact that cannabis has extremely versatile uses, currently most studies research only the chemical composition of the secondary metabolites of female cannabis inflorescences and their medicinal properties. The main goal of the research was to analyse the available data on the use of cannabis in the Balkan Peninsula in the past and to check whether there are connections between certain parts of the plant and the method of use and, if so, to what extent they are connected. Literature was collected from online databases and digital libraries (Scopus, Google Scholar, Cobiss) using keywords ('cannabis AND ethnobotany'), 'cannabis AND Slovenia/Bosnia and Herzegovina/Serbia/Macedonia/Croatia/ Montenegro/Kosovo', "cannabis AND traditional use").We found 23 publications in online databases published between 1966 and 2021. The most data was found for Croatia, and the least for Kosovo and Slovenia. The analysis showed that the traditional use of cannabis varies between individual countries. According to a review of traditional use literature, in the past, hemp was most commonly used in the Balkan Peninsula for fiber production, medicinal purposes, and food. We found the least data on use for psychoactive purposes, as its use is not legalized. The results showed that the most frequently used parts of the plant are seeds, stems and leaves, while the least amount of data was found for the use of inflorescences, roots, bark, resin and other parts of the plant. All collected data on the traditional use of cannabis in the Balkan Peninsula will be included in the CANNUSE-database of traditional Cannabis uses (http://cannusedb.csic.es) and thus accessible to the general public.

Key words: *Cannabis sativa L*., hemp, ethnobotany, traditional use, Balkan

SR - 6

PRIMJENA ALLIUM TESTA ZA ISPITIVANJE KVALITETA VODE SA RAZLIČITIH LOKALITETA

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Sažetak: Sve vode, bilo da su prirodnog ili antropogenog porijekla, imaju svoje određene kvalitete ili karakteristike, a zbog različitih zagađenja one gube svoj kvalitet i mijenjaju karakteristike. Danas postoje brojne hemijske, fizičko-hemijske i biološke analize za utvrđivanje kvaliteta voda. Biološke metode zasnivaju se na primjeni test organizama–bioindikatora. Allium test je dobro poznat i jednostavan biotest, a pomoću njega se može odrediti ukupna toksičnost, citotoskičnost i genotoksičnost. S toga, cilj istraživanja je utvrditi razlike u kvalitetu različitih vrsta voda primjenom crvenog luka (*Allium cepa L.*) kao biondikatora. Za vrijeme ispitivanog perioda praćeni su parametri: suha i svježa materija, dužina korijena i antioksidativna aktivnost. Na osnovu posmatranih parametara uočeno je da postoje razlike u kvalitetu vode između kontrolne vode i voda sa drugih različitih lokaliteta. Najduži korijen imale su lukovice koje su rasle u uzorku iz izvora Fiskije koji je iznosio 3,05 cm, dok su najmanji korijen imale lukovice koje su rasle u uzorku destilovane vode, sa dužinom korijena od 0,75 cm. Procenat vlage lukovica kreće se u rasponu od 86,46 % do 90,31 %, pri čemu su najmanji procenti zabilježeni u lukovicama koje su rasle u vodi iz izvora Dabar, dok najveći procenat vlage su imale lukovice koje su rasle u vodi izvora Hašimovića bunar. Antioksidativna aktivnost lukovica u svim uzorcima vode kreće se u rasponu od 14,94 % do 55,23 %, gdje su najveći procenti (55,23 %) zabilježeni u lukovicama koje su rasle u uzorku iz vode rijeke Sane iz Sanskog Mosta, dok su najmanji procenti (14,94 %) uočeni kod lukovica koje su rasle u uzorku destilovane vode. Korijen luka koji je rastao u uzorku vode iz izvora Fiskija imao je najviši procenat (37,36 %) antioksidativne aktivnosti, dok je najmanji procenat (13,42 %) zabilježen u uzorku koji je uzet iz rijeke Sane u Prijedoru.

Ključne riječi: kvalitet vode, Allium test, dužina korijena, svježa i suha masa, antioksidativna aktivnost

APPLICATION OF THE ALLIUM TEST FOR EXAMINATION THE QUALITY OF WATER FROM DIFFERENT LOCATIONS

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All waters, whether of natural or anthropogenic origin, have certain qualities or characteristics, and due to various pollutions, they lose their quality and change their characteristics. Today, there are numerous chemical, physical-chemical and biological analyzes for determining the quality of water. Biological methods are based on the application of test organisms–bioindicators. The Allium test is a well-known and simple bioassay, and it can be used to determine total toxicity, cytotoxicity and genotoxicity. Therefore, the aim of the research is to determine the differences in the quality of different types of water using red onion (Allium cepa L) as a bioindicator. During the investigated period, parameters were monitored: dry and fresh matter, root length and antioxidant activity. Based on the observed parameters, it was noticed that there are differences in water quality between control water and water from other different localities. The bulbs growing in the sample from the Fiskija source had the longest roots, which was 3.05 cm, while the bulbs growing in the distilled water sample had the smallest roots, with a root length of 0.75 cm. The moisture percentage of the bulbs ranges from 86.46% to 90.31%, with the lowest percentages recorded in the bulbs that grew in the Dabar source, while the highest percentage of moisture was in the bulbs that grew in the source Hašimovića bunar. The antioxidant activity of bulbs in all water samples ranges from 14.94% to 55.23%, where the highest percentages (55.23%) were recorded in bulbs that grew in the sample from the Sana River from Sanski Most, while the lowest percentages (14.94 %) were observed in the bulbs that grew in the distilled water sample. Onion root that grew in the water sample from Fiskija source had the highest percentage (37.36 %) of antioxidant activity, while the lowest percentage (13.42 %) was recorded in the sample of the Sana River from Prijedor.

Key words: water quality, Allium test, root length, fresh and dry weight, antioxidant activity

SR - 7

KOMUNIKACIJA U ZDRAVSTVU

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Sažetak: Komunikacijske vještine su jedna od ključnih kompetencija za ličnu realizaciju i razvoj kvalitetnih odnosa između zdravstvenog osoblja i pacijenata. Komunikacija u medicini je klinička vještina koja se uči, podučava i praktikuje. Za bolje razumijevanje pacijentovih patnji i strahova u terapijskom procesu, neophodno je aktiviranje sopstvenih empatičkih moći, koje postižemo prvenstveno kvalitetnom komunikacijom sa pacijentom. Cilj ovog rada je pregledom literature prikazati specifičnosti u komunikaciji sa bolesnikom i unutar multidisciplinarnog tima. Oslovljavanje pacijenta imenom izvlači ga iz osjećaja usamljenosti i napuštenosti. U slučaju dugotrajnog boravka na bolničkim odjeljenjima, važno je da pacijent poznaje po imenu najmanje jednu osobu u zdravstvenom timu, te da je mirno i razumiljivo obavješten o mjestu, vremenu i svrsi pružanja medicinske pomoći te dobiti informisani pristanak. Prilikom verbalne komunikacije sa pacijentom, potrebno je izbjegavati stručnu terminologiju te je prilagoditi pacijentovom intelektualnom i zdravstvenom statusu. Tokom posjete treba razgovarati sa pacijentom, a ne o pacijentu. Prilikom saopštavanja loših vijesti, u dostupnoj literaturi, preporučuje se primjena SPIKES protokola, koji podrazumijeva: pripremu i početak razgovora sa bolesnikom, procjenu bolesnikove informisanosti, bolesnikov pristanak za informacije, prezentacija loših vijesti, emotivna reakcija i odgovor empatijom i plan liječenja kao odgovor na lošu vijest. U cilju unapređenja razumijevanja holističkog pristupa bolesniku i unapređenja razumijevanja složenih donosa razvila se Balintova metoda, u kojoj se grupe zdravstvenih stručnjaka sastaju sa ciljem da unaprijede razumijevanje složenog odnosa između zdravstvenih radnika i njihovih pacijenata. Grupe vode obučeni stručnjaci, a interesovanje zdravstvenih radnika za traženje brzog i stvarnog odgovora na rješenje trenutnog zdravstvenog problema pacijenta kreće se ka jačanju sposobnosti zdravstvenog radnika da stvara bliže odnose i stvarnu brigu o pacijentu. Nekomunikacija ili loša komunikacija može dovesti do niza nesporazuma koji mogu imati brojne neprijatne posljedice kako za pacijenta tako i za zdravstvenog radnika. Znanje i vještina kvalitetne komunikacije preduslov su dobrog liječenja.

Ključne riječi: verbalna komunikacija, SPIKES, Balintova metoda

COMMUNICATION IN HEALTHCARE

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Abstract: Communication skills are one of the key competencies for personal realization and development of quality relationships between healthcare staff and patients. Communication in medicine is a clinical skill that is learned, taught and practiced. For a better understanding of the patient's sufferings and fears in the therapeutic process, it is necessary to activate one's own empathetic powers, which we achieve primarily through quality communication with the patient. The aim of this paper is to present the specifics of communication with the patient and within the multidisciplinary team through a review of the literature. Addressing the patient by name takes them out of the feeling of loneliness and abandonment. In the case of a long-term stay in hospital wards, it is important that the patient knows at least one person in the health care team by name, and that they are calmly and comprehensibly informed about the place, time and purpose of providing medical assistance and obtain informed consent. During verbal communication with the patient, it is necessary to avoid professional terminology and adapt it to the patient's intellectual and health status. During the visit, you should talk to the patient, not about the patient. When communicating bad news, in the available literature, it is recommended to apply the SPIKES protocol, which includes: preparing and starting a conversation with the patient, assessing the patient's information, the patient's consent for information, presentation of bad news, emotional reaction and response with empathy, and a treatment plan in response to bad news. In order to improve the understanding of the holistic approach to the patient and to improve the understanding of complex outcomes, the Balint method was developed, in which groups of health experts meet with the aim of improving the understanding of the complex relationship between health workers and their patients. The groups are led by trained experts, and the interest of health workers in seeking a quick and real answer to the solution of the patient's current health problem is moving towards strengthening the health worker's ability to create closer relationships and real care for the patient. Non-communication or poor communication can lead to a series of misunderstandings that can have numerous unpleasant consequences for both the patient and the healthcare worker. Knowledge and skills of quality communication are a prerequisite for good treatment.

Key words: verbal communication, SPIKES, Balint's method

INDEKS AUTORA/INDEX OF AUTHORS

A

Aljetić, G. 97, 98

B

Babić M. 69, 70
Bajić G. 69, 70
Balaban – Marjanović Ž. 107, 108, 135, 136, 145, 146
Balant M. 163, 164
Blagojević S. 131, 132
Blesić M. 5, 6
Božić Lj. 149, 150, 151, 152
Brenjo D. 111, 112, 119, 120, 121, 122
Bukvički D. 53, 54
Burazor M. 157, 158

Č

Čeko S. 41, 42
Čolić G. 99, 100
Čolić T. 19, 20

Ć

Ćejić V. 147, 148

D

Dalmacija T. 163, 164
Dobrovoljski D. 49, 50
Domuz S. 23, 24
Duka K. 111, 112, 119, 120

Đ

Đajić S. 167, 168
Đokić D. 131, 132
Đurđević – Milošević D. 27, 28, 105, 106, 109, 110, 135, 136

E

Egeljić Mihailović N. 49, 50. 149, 150
Elez J. 105, 106

G

Gagula G. 105, 106, 109, 110
Gajić D. 59, 60
Gojković Cvjetković V. 107, 108, 145, 146
Golić S. 131, 132
Govedar Z. 25, 26, 121, 122, 125, 126
Grubor P. 13, 15
Grujić I. 129, 130
Grujić R. 25, 26, 115, 116, 121, 122, 125, 126, 139, 140, 141, 142, 145, 146
Guzijan G. 147, 148

H

Hadživuković N. 37, 38
Helvida A. 47, 48

I

Ilić T. 135, 136
Ivanov M. 53, 54
Ivanović L. 21, 22

J

Janković D. 103, 104
Jovanović G. 109, 110
Jovanović Srzentić S. 147, 148
Jović D. 49, 50, 149, 150

K

Kacjan Žgajnar K. 83, 84
Kalaba D. 135, 136
Kalaba V. 107, 108, 135, 136
Kalajdžić O. 37, 38
Kaledner Smajlović S. 11, 12
Karić E. 165, 166
Kemp E. 93, 94
Knežević D. 49, 50, 149, 150
Kostić M. 89, 90
Kovačević O. 33, 34
Kucurski Lj. 37, 38, 51, 52, 155, 156, 167, 168
Kuduzović E. 161, 162

L

Laštro D. 59, 60, 63, 64, 87, 88, 89, 90
Latinović B. 129, 130
Lilić M. 147, 148

M

Malinović N. 71, 72, 113, 114, 117, 118, 165, 166
Medenica V. 21, 22, 87 ,88
Mikić V. 73, 74
Milaković M. 147, 148
Milanović M. 97, 98
Milosavljević T. 39, 40
Mitrović S. 147, 148
Mraković B. 59, 60
Mujezinović A. 47, 48

N

Ncube T. 105, 106
Nikolić S. 59, 60
Novalić Dž. 159, 160, 161, 162
Nožinić M. 121, 122

NJ

Njegovan Zvonarević T. 77, 78, 81, 82, 85, 86, 95, 96

O

Obradović M. 139, 140, 141, 142
Ogurlić R. 65, 66
Oruč M. 45, 46, 47, 48

P

Pantelić J. 151, 152
Pantelić J. 151, 152
Pavlović J. 37, 38
Perić B. 131, 132
Petković B. 103, 104
Petković M. 143, 144, 149, 150
Petrović A. 105, 106, 109, 110
Petrović P. 33, 34, 92
Pijunović V. 119, 120
Pilipović – Spasojević O. 59, 60, 63, 64
Pivač S. 11,12
Plemelj Mohorič A. 79, 80, 83, 84
Popović – Pejičić S. 3,4
Predojević J. 23, 24
Prohorova L.N. 125, 126
Pržulj N. 25, 26, 111, 112, 121, 122, 125, 126
Pulić E. 77, 78, 81, 82, 85, 86, 95, 96

R

Rekanović S. 115, 116
Ristić I. 99, 100
Ristić S. 103, 104
Rubin M., 51, 52

S

Stoičević N. 39, 40
Sovilj M. 43, 44, 55, 56
Stojković D. 53, 54
Stojanović N. 55, 56
Spasojević N. 63, 64, 124
Stijepić I. 67, 68, 71, 72, 87, 88, 117, 118
Stijepić M. 71, 72, 113, 114, 117, 118, 165, 166
Selić Despotović M. 73, 74
Savković N. 89, 90, 91
Savković G. 91
Selak – Đukelić B. 147, 148
Savić Lj. 155, 156, 167, 168
Stefanovski G. 17, 18
Sredić Cartes D. 17, 18, 61, 62
Slunjski Tišma L. 19,20, 87, 88, 167, 168
Samardžić S. 23, 24

Š

Šarac – Kaurin B. 141, 142
Šimić – Stanisavić J. 131, 132
Šimunović D. 77, 78, 81, 82, 85, 86, 95, 96
Šljivo B. 45, 46
Šmitran A. 151, 152

T

Telebak D. 31, 32, 35, 36
Terzić E. 161, 162
Tešić M. 109, 110
Trifunović S. 131, 132

U

Ubiparipović J. 61, 62
Uljar A. 155, 156

V

Vranješ D. 127, 128
Vujasinović D. 71, 72
Vukićević A. 65, 66
Vukmirović S. 7,8
Vuković Kostić Ž. 31, 32, 35, 36
Vuković Ž. 31, 32, 35, 36

Z

Zavišić G. 103, 104

Ž

Živanović S. 37, 38

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