

# Book of Summaries



**13 MEĐUNARODNA  
KONFERENCIJA  
"SPORTSKE NAUKE I  
ZDRAVLJE"**  
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CONFERENCE ON "SPORTS  
SCIENCE AND HEALTH"*

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UNIVERSITY ABAI



FAKULTET ZA SPORT I TURIZAM





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KONFERENCIJA "SPORTSKE  
NAUKE I ZDRAVLJE"  
13<sup>th</sup> INTERNATIONAL  
CONFERENCE ON "SPORTS  
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## DINAMIČKA RAVNOTEŽA KAO PREDIKTOR OZLJEDA DONJIH UDOVA U NOGOMETAŠA; PROSPEKTIVNA ANALIZA TIJEKOM JEDNE POLUSEZONE.

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### APSTRAKT

Dinamička ravnoteža važan je čimbenik u nogometu. Dosadašnja istraživanja su rijetko ispitala utjecaje dinamičke ravnoteže kao prediktora ozljeđivanja u nogometu. Ovo istraživanje imalo je za cilj prospektivno procijeniti moguće utjecaje dinamičke ravnoteže na pojavu ozljeda kod profesionalnih nogometaša. Sudionici su bili 116 profesionalnih nogometaša iz Premijer lige Bosne i Hercegovine (svi muškarci,  $24,4 \pm 4,7$  godina), koji su bili podvrgnuti antropometriji te procjeni dinamičke ravnoteže na početku druge polusezone 2019./20. Za utvrđivanje razlika između skupina na temelju pojave ozljeda korišten je t-test te univarijatne i multivarijatne logističke regresije kako bi se identificirale povezanosti između prediktora i ishoda. Rezultati su pokazali da je kompozitni doseg kod nogometaša bio značajno različit kod ozlijeđenih u odnosu na neozlijeđene nogometaše. Kod desne noge iznosi u procentima 84.5 kod ozlijeđenih, kod neozlijeđenih on iznosi 96.8 ( $P=0,04$ ). Kompozitni doseg kod lijeve noge iznosi u procentima 84.6 kod ozlijeđenih, kod neozlijeđenih on iznosi 97.2 ( $P=0,03$ ). Zaključak: Kako bismo ciljali na one igrače koji su pod većim rizikom od ozljeda, posebnu pozornost treba obratiti na igrače koji imaju lošiju dinamičku ravnotežu pogotovo kompozitni doseg. Poboljšanje dinamičke ravnoteže trebalo bi biti korisno za smanjenje rizika od ozljeda u nogometu.

**Ključne riječi:** dinamička ravnoteža, nogomet, prediktori, ishod

## DYNAMIC BALANCE AS A PREDICTOR OF LOWER LIMB INJURIES IN FOOTBALL PLAYERS; PROSPECTIVE ANALYSIS DURING ONE HALF SEASON

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### ABSTRACT

Dynamic balance is an important factor in soccer. Previous research has rarely examined the influence of dynamic balance as a predictor of injury in soccer. This study aimed to prospectively evaluate the possible effects of dynamic balance on the occurrence of injuries in professional soccer players. The participants were 116 professional soccer players from the Premier League of Bosnia and Herzegovina (all men,  $24.4 \pm 4.7$  years old), who underwent anthropometry and dynamic balance assessment at the beginning of the second half of the 2019/20 season. To determine differences between groups based on the occurrence of injuries, t-tests, and univariate and multivariate logistic regression were used to identify associations between predictors and outcomes. The results showed that the composite reach in soccer players was significantly different in injured compared to uninjured soccer players. In the case of the right leg, it is 84.5 percent in the injured, and 96.8 in the uninjured ( $P=0.04$ ). The composite reach of the left leg is 84.6 percent in the injured, and 97.2 percent in the uninjured ( $P=0.03$ ). Conclusion: To target those players who are at higher risk of injury, special attention should be paid to players who have worse dynamic balance, especially composite reach. Improving dynamic balance should be beneficial in reducing the risk of injury in soccer.

**Key words:** dynamic balance, football, predictors, outcome

## TECHNOLOGICAL READINESS AND PSYCHOLOGICAL WELL-BEING SERVE AS PREDICTORS OF STUDENTS' ACADEMIC PERFORMANCE?

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### ABSTRACT

This study intends to investigate the relationship between technology readiness and psychological well-being with academic performance. The investigation utilised a quantitative approach and correlational statistical procedure. In this study, the participants were students majoring in physical education at the Universitas Negeri Surabaya in Indonesia (n=85). The current study adopted questionnaires to evaluate technology readiness and psychological well-being, whereas test scores served as indicators of student academic accomplishment. IBM SPSS was employed to evaluate this study's normality and descriptive statistics. In the meantime, the Pearson correlation was utilised to test the relationship between variables. A multiple regression analysis was run to examine the strongest predictor of technology readiness, psychological well-being with academic performance. The results indicated a significant positive relationship between of technology readiness and psychological well-being with academic performance (p-values $\leq$ 0.05). Thus, it may be inferred that technology readiness and psychological well-being components could be predictors of academic performance in physical education for students. This study's findings contribute to our knowledge and supply lecturers with information and scientific insight into the significance of technology readiness and psychological well-being for university students.

**Keyword:** Technology Readiness, Psychology Well-Being, Academic Performance, Physical education

## UTICAJ DIMENZIJA LIČNOSTI MODELA VELIKIH PET NA MOTIV POSTIGNUĆA KOD ODBOJKAŠA JUNIORA

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### SAŽETAK

Cilj ovog istraživanja bio je da se ispita u kojoj meri dimenzije ličnosti modela Velikih pet mogu objasniti varijansu motiva postignuća i njegove komponente na prigodnom uzorku odbojkaša juniora (N=144) iz Republike Srbije. Primenjena su dva merna instrumenta: Inventar Velikih pet (BFI) i Skala motiva postignuća (MOP2002). Pokazalo se u regresionom modelu da je dimenzija savjesnost najintenzivniji prediktor linearne korelacije sa motivom postignuća. Takođe, utvrđeno je da ova nezavisna varijabla predstavlja statistički značajnu determinantu, pozitivnog smera, kod svih analiziranih komponenti motiva postignuća adolescenata. Druge ispitivane varijable modela Velikih pet pokazale su se kao relevantne parcijalne odrednice u predikciji jedne ili više komponenti zavisne varijable motiva postignuća. Konkretnije, regresori dimenzije ličnosti su sa maksimalnim procentom proporcije varijanse objasnili motiv postignuća - komponentu istrajnosti u realizaciji cilja, dok je sa minimalnim procentom proporcije varijanse motiv postignuća objašnjen - komponentom takmičenja sa drugima. Dobijeni nalazi u sprovedenoj multiploj regresiji mogu poslužiti trenerima pri selekciji sportista za takmičenja, te kao podsticaj za dalja i detaljnija istraživanja o ulozi regresora ličnosti modela Velikih pet za predviđanje motiva postignuća u odbojkaškoj adolescentskoj populaciji.

**Cljučne reči:** adolescenti, savjesnost, odbojkaši juniori, istrajnost u realizaciji cilja

## INFLUENCE OF THE PERSONALITY DIMENSIONS OF THE BIG FIVE MODEL ON THE ACHIEVEMENT MOTIVE IN JUNIOR VOLLEYBALL PLAYERS

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### ABSTRACT

The aim of this research was to examine, using the pertinent sample of junior volleyball players from Serbia (N=146), to which extent the personality dimensions of The Big Five model can explain the variance of the achievement motive and its components. Two measuring instruments were used: The Big Five Inventory (BFI) and Structure of achievement motive (MOP 2002 scale). The regression model revealed that the dimension conscientiousness is the most intense predictor of linear correlation to the achievement motive. Additionally, it has been determined that this independent variable represents the statistically significant determinant, of positive direction, of all analyzed components of the achievement motive in adolescents. Other examined variables of The Big Five model turned out to be relevant partial determinants in predicting one or more components of the dependent variable achievement motive. More precisely, the regressors of the personality dimensions explained the achievement motive with the maximal proportion variance – the component persistence in goal realization, while the component competing against others accounted for the minimal proportion variance. The findings obtained after conducting the multiple regression analysis can be useful for coaches during the process of selecting athletes for competitions, and can also serve as an incentive for further and more detailed research on the role of the regressor of the Big Five personality model in predicting the achievement motive in volleyball adolescent population.

**Key words:** adolescent, conscientiousness, junior volleyball players, persistence in goal realization.

## ZNANJE KAO RESURS RAZVOJA SPORTSKO-REKREATIVNOG TURIZMA

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### APSTRAKT

Uspješno obavljanje poslovnih aktivnosti u okruženju savremenog turizma determinisano je znanjem i sposobnostima (kompetencijama) svakog pojedinca angažovanog u ovoj oblasti, sa jedne strane, ali i prirodom usluga povezanih sa specifičnostima konkretnog oblika turizma, sa druge strane. Današnji teoretičari i praktičari menadžmenta u turizmu znanje pozicioniraju kao primaran resurs koji projektuje dugoročno održivu i nadmoćnu poziciju određene turističke organizacije i/ili destinacije među konkurentima na tržištu. U tom smislu se znanje i, sa njime povezani, kontekst kompetencija ljudskog potencijala u sportsko-rekreativnom turizmu može smatrati ključnim održivim izvorom konkurentne prednosti.

Kompetencije ljudskih resursa su interaktivno povezane sa njihovom radnom efikasnošću. U tom smislu se kompetentnost za obavljanje određene radne pozicije u selektivnim oblicima turizma pojavljuje kao merljiva organizacijska kategorija. Ključnim komponentama kompetencija kadrova u sportsko-rekreativnom turizmu se smatraju: znanje, poslovne veštine, usvojeni stavovi i vrednosne orijentacije. Na njihovo formiranje i razvoj može se uticati različitim oblicima edukacije: formalne, neformalne i informalne.

Sticanje kompetencija kadrovi koji rade u turizmu u Republici Srbiji mogu ostvariti kroz tri oblika: (a) školovanjem u sistemu formalnog visokog obrazovanja (akademske i strukovne studije turizma i sa njime komplementarnih oblasti), (b) stručnim osposobljavanjem u sistemu neformalnog obrazovanja (realizuje se kroz saradnju organizacija iz oblasti turizma sa korelativnim akademskim institucijama, ali i odgovarajućim strukovnim i poslovnim udruženjima) i (c) kroz proces informalnog obrazovanja (kao usvojen kognitivni obrazac o potrebi permanentnog podizanja kompetencija i celoživotnog učenja).

Usmerenje ovog saopštenja je fokusirano na kvalitativnu teorijsku eksplikaciju važnosti činilaca koji determinišu znanje kao ključni resurs razvoja sportsko-rekreativnog turizma u Republici Srbiji.

**Ključne reči:** znanje, edukacija, kompetencije, sportsko-rekreativni turizam

## KNOWLEDGE AS A RESOURCE FOR THE DEVELOPMENT OF SPORTS AND RECREATIONAL TOURISM

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### ABSTRACT

The successful performance of business activities in the environment of modern tourism is determined by the knowledge and abilities (competencies) of each individual engaged in this field, on the one hand, but also by the nature of services related to the specifics of the specific form of tourism, on the other hand. Today's theoreticians and practitioners of tourism management position knowledge as a primary resource that projects a long-term sustainable and dominant position of a certain tourist organization and/or destination among competitors on the market. In this sense, knowledge and, related to it, the context of human potential competences in sports-recreational tourism can be considered a key sustainable source of competitive advantage.

Human resources competencies are interactively related to their work efficiency. In this sense, the competence to perform a specific job position in selective forms of tourism appears as a measurable organizational category. The key components of staff competencies in sports and recreational tourism are considered to be: knowledge, business skills, adopted attitudes and value orientations. Their formation and development can be influenced by different forms of education: formal, non-formal and informal. The personnel working in tourism in the Republic of Serbia can achieve competencies thru three forms: (a) schooling in the system of formal higher education (academic and professional studies of tourism and its complementary fields), (b) professional training in the system of informal education (realized through the cooperation of organizations from the field of tourism with correlative academic institutions, but also with appropriate professional and business associations) and (c) through the process of informal education (as an adopted cognitive pattern on the need for permanent improvement of competences and lifelong learning).

The direction of this announcement is focused on a qualitative theoretical explanation of the importance of factors that determine knowledge as a key resource for the development of sports and recreational tourism in the Republic of Serbia.

**Keywords:** knowledge, education, competences, sports and recreational tourism

## EFEKTI ŠESTOSEDMIČNOG PRIPREMNOG PERIODA NA TRANSFORMACIJU SPOSOBNOSTI BRZINE I AGILNOSTI KOD NOGOMETAIŠICA SENIORKI

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### SAŽETAK

Cilj ovog istraživanja bio je utvrditi efekte šestosedmičnog pripremnog perioda na razvoj brzine i agilnosti kod nogometašica ŽN/FK Emina iz Mostara (n=18), koje se takmiče u Premijer ligi Bosne i Hercegovine u sezoni 2021/22. U istraživanju su primijenjene varijable za utvrđivanje osnovnih obilježja nogometašica: Starost (godine), Visina (cm), Masa (kg), BMI (kg/m<sup>2</sup>), za procjenu sposobnosti brzine: Sprint 5m (s), 10m (s), 20m (s) i agilnosti: test 10x5 m (s), test Cik-Cak (s) i test 505 (s). Nogometašice su prosječne starosti 21,27 ±4,57 godina, visine 167,2 cm ±5,82cm i mase 60,4 kg ±7,36 kg. Za utvrđivanje statističke značajnosti razlika aritmetičkih sredina između inicijalnog i finalnog mjerenja korišten je T-test za zavisne uzorke. Rezultati T-testa pokazuje da su ispitanice nakon šestosedmičnog pripremnog perioda imale manju masu (t=3,027; df=17; sig.= 0,008; p≤ 0,05) i BMI (t=2,253; df=17; sig.= 0,038; p≤ 0,05). Statistički značajne razlike na nivou od p≤ 0,05, nakon provedenog programa imamo kod testova agilnosti 10x5m (t=3,125; df=17; sig.=0,006) i testa „505“ (t=3,028; df=17; sig.= 0,008). Kod ostalih varijabli imamo pozitivne promjene ali one nisu statistički značajne na nivo p≤ 0,05. Zaključujemo da je šestosedmični program rada u pripremnom periodu proizveo statistički značajne promjene u prostoru agilnosti i da trenažni proces treba više usmjeriti na poboljšanje brzine i brzinske izdržljivosti kod datog uzorka nogometašica.

**Ključne riječi:** ženski nogomet, agilnost, brzina, trening, pripremi period

## THE EFFECTS OF A SIX-WEEK PREPARATORY PERIOD ON THE TRANSFORMATION OF SPEED AND AGILITY ABILITY IN SENIOR FEMALE SOCCER PLAYERS

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### ABSTRACT

The aim of this research was to determine the effects of a six-week preparatory period on the development of speed and agility in female soccer players of "Emina" Women's Soccer Team of Mostar (n=18), who competed in the Premier League of Bosnia and Herzegovina in the season 2021/22. In the research, variables were applied to determine the basic characteristics of female soccer players: Age (years), Height (cm), Mass (kg), BMI (kg/m<sup>2</sup>), to assess speed ability: Sprint 5m (s), 10m (s), 20m (s) and agility: 10x5 m test (s), Zig-Zag test (s) and 505 test (s). The average age of female soccer players was 21.27 ± 4.57 years, average height 167.2 cm ± 5.82 cm and average weight 60.4 kg ± 7.36 kg. The dependent samples *T*-test was run to determine the statistical significance of the differences in arithmetic means between the initial and final measurements. The reported results of the *T*-test showed that after the six-week preparatory period, the test subjects had a lower mass ( $t=3.027$ ;  $df=17$ ;  $sig.=0.008$ ;  $p\leq 0.05$ ) and BMI ( $t=2.253$ ;  $df=17$ ;  $sig.=0.038$ ;  $p\leq 0.05$ ). Statistically significant differences at the level of  $p\leq 0.05$ , after the program had been completed, were reported for the agility tests 10x5m ( $t=3.125$ ;  $df=17$ ;  $sig.=0.006$ ) and 505 test ( $t=3.028$ ;  $df=17$ ;  $sig.=0.008$ ). In other variables, positive changes were reported, but they were not statistically significant at the  $p\leq 0.05$  level. We concluded that the six-week preparatory period program produced statistically significant changes in the area of agility and that the training should focus more on improving speed and speed endurance in the given sample of female soccer players.

**Key Words:** women's soccer, agility, speed, training, preparatory period

## EFEKTI HARD BODY PROGRAMA NA PROMJENE SASTAVA TIJELA KOD REKREATIVACA

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### SAŽETAK

Na uzorku od 44 vježbača rekreativaca, od toga 27 ženskih i 17 muških, starosti od 25 do 40 godina, izvršeno je istraživanje sa ciljem da se utvrdi da li i u kojoj mjeri je tromjesečni Hard Body program vježbanja uticao na promjene u njihovoj tjelesnoj kompoziciji.

U istraživanju su primijenjene tri antropometrijske mjere, visina tijela, težina tijela i obim struka, a mjerenjem koje je izvršeno pomoću Tanita vage, model BC-545N, dobijene su vrijednosti sljedećih varijabli: postotak potkožnog masnog tkiva, postotak mišićnog tkiva, postotak koštanog tkiva, body mass index (BMI), dnevni unos kalorija - Daily Calorie Intake (DCI), metabolička dob - Metabolic Age (MA), postotak vode i postotak visceralnog masnog tkiva.

Mjerenje primijenjenih varijabli izvršeno je u dvije vremenske tačke, inicijalno (na početku realizacije programa), i finalno (poslije realizacije programiranog vježbanja). Treninzi su obavljani četiri puta sedmično i bili su isto prilagođeni svakom rekreativcu.

U postupku obrade podataka, izračunati su osnovni centralni i disperzioni parametri. Za utvrđivanje promjena (razlika aritmetičkih sredina dva između inicijalnog i finalnog mjerenja) nastalih pod uticajem programa primijenjena je analiza rezultata T - testa.

Rezultati T - testa upućuju na konstataciju da je primijenjeni tromjesečni Hard Body program proizveo statistički značajne promjene u većini pokazatelja kompozicije (sastava) tijela.

**Ključne riječi:** hard body, tjelesna kompozicija, T - test, vježbači

## EFFECTS OF THE HARD BODY PROGRAM ON CHANGES OF BODY COMPOSITION IN RECREATIONAL EXERCISERS

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### SUMMARY

The study was conducted on a sample of 44 recreational exercisers, of which 27 were female and 17 were male, aged 25 to 40, with the aim of determining, whether and to what extent a three-month hard body exercise program affects changes in their body composition.

The following anthropometric measurements of body height, body weight and waist circumference were used in the research, and the following variables were obtained by measuring with a Tanita scale, model BC-545N: percentage of subcutaneous fat, percentage of muscle tissue, percentage of bone tissue, body mass index (BMI), daily calorie intake - Daily Calorie Intake (DCI), metabolic age - Metabolic Age (MA), water percentage and visceral fat percentage.

The measurement of the applied variables was performed at two time points, initially (at the beginning of the implementation of the program) and final (after the implementation of the programmed exercise).

The trainings were performed four times a week and were equally adapted to each recreational exerciser. In the data processing procedure, the basic central and dispersion parameters were calculated. To determine the changes that occurred under the influence of this program, an analysis of the results of the T-test was applied.

The results of the T-test indicate that the applied three-month Hard Body program produced statistically significant changes in most indicators of body composition.

**Keywords:** hard body, body composition, T-test, exercisers.



## СОЦИОЛОШКА ПЕРСПЕКТИВА ТРАНСХУМАНИЗМА КРОЗ ПРИЗМУ СПОРТСКО-МАРКЕТИНШКЕ ИНДУСТРИЈЕ

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### АПСТРАКТ

У раду је направљена паралела између социолошких и трансхуманистичких идеја. Трансхуманизам је интелектуални, културни, научни и уметнички покрет, који, темељен на научним спрегама технологије и економије, подр(а)жава и потиче развој и употребу нових научних и технолошких решења за побољшање људских физичких, менталних и других способности. У овом истраживању трансхуманизам је размотрен са четири аспекта: социолошког, спортског, маркетиншког и аспекта вештачке интелигенције. Социолошке перспективе укључују препознавање и процену ефеката друштвених односа, као и друштвених структура и сила, с обзиром на садашњост у историјском контексту које подстичу на критичко размишљање. Покушали смо да рашчланимо како се производња, дистрибуција и перцепција спорта најбоље могу разумети управо из социолошке перспективе. Трансхуманистички маркетинг ће у будућем периоду бити од суштинске важности при уверавању потрошача како је та промена веома важна. Трансхуманизам у будућој вештачкој интелигенцији може помоћи људима у превазилажењу својих ограничења.

**Кључне речи:** социологија, трансхуманизам, спорт, маркетинг, вештачка интелигенција

## CHANGES OF THE HEART RATE VARIABILITY WITHIN THE ACTIVE STAND TEST DYNAMICS AMONG ATHLETES WITH REDUCED PHYSICAL PERFORMANCE

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### ABSTRACT

Overtraining is regarded as a necessary stimulus to increase sports performance. On the other hand, adequate training with balanced recovery is also essential: performance may fall if there is no mutual balance. Physical exercise can be measured quantitatively via different methods. Heart rate variability measurements have remained relevant for the last decade. The heart rate variability provides vegetative blood circulation control. It describes the organism and cardiovascular ability to change heart rate for external and internal adaptation.

We examined two groups of 71 athletes. Within the main group of 30 persons, the heart rate and blood pressure reactions to the Letunov test were unsatisfactory. For the comparison group of 41 individuals, the reactions were opposite.

Practically, all indexes of the heart rate variability prevailed among athletes with a normal hemodynamic reaction to standard physical exercises. After the test, the heart rate recovery for a satisfactory hemodynamic reaction was complete (there were no changes in the heart rate variability:  $p > 0.05$ ). However, caused by body position shifts, sympathetic activities affected the main test group. Most statistical data showed a significant variability decrease ( $p > 0.05$ ).

Therefore, measurements of the heart rate variability for the pre- and post-postural exercises prove the insufficient and slow hemodynamic recovery of athletes with an unsatisfactory cardiovascular reaction to standard physical load. Besides, there is a rising vegetative dysfunction with the dominant sympathetic tone due to the parasympathetic decrease.

**Key words:** heart rate variability, overtraining, orthostatic test, physical performance, athletes.

## UTJECAJ NIVOA TJELESNE AKTIVNOSTI NA SIMPTOME I TRAJANJE OPORAVKA OD BOLESTI COVID 19

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### SAŽETAK

Nedovoljna tjelesna aktivnost i sedentarni način života su veliki dio populacije sa hroničnim bolestima izložili puno većem riziku oboljevanja od COVID-19 sa izuzetno teškim posljedicama po zdravlje, kao i dugotrajnim iscrpljujućim oporavkom nakon bolesti. Redovnan tjelesna aktivnost kao jedan od načina prevencije i bržeg oporavka od bolesti COVID-19 predstavlja važan prioritet unapređenja zdravlja i kvalitete života ljudi. Cilj rada je bio utvrditi povezanost redovne tjelesne aktivnosti stanovništva sa prisustvom simptoma i vremenom oporavka od COVID-19. Ukupan broj ispitanika za ovo istraživanje je činilo 100 osoba, oba spola (muškarci=32, žene=68) mlađe životne dobi (age: 30-44 godine), bez postojećih hroničnih bolesti, a prebolovale su COVID-19. Podaci o redovnosti vježbanja, simptomima i vremenu koje je bilo potrebno za oporavak, dobivene su na osnovu anketnog upitnika osmišljenog za potrebe ovog istraživanja. Ispitanici su na osnovu nivoa aktivnosti podijeljeni u dvije skupine: Aktivni (A= 53) u kontinuitetu najmanje tri mjeseca dva puta sedmično po 60 minuta i skupina Neaktivni (N=47) koje nisu nikada vježbali niti su tjelesno aktivni. Za utvrđivanje razlika opaženih frekvencija korišten je Chi-square test ( $\chi^2$  test razlika između grupa). Rezultati istraživanja su pokazali da između dvije grupe postoje statistički značajne razlike ( $p < 0.001$ ) u korist grupe aktivnih ispitanika kada je u pitanju težina simptoma bolesti COVID-19, a njihov oporavak nakon bolesti trajao je kraće u odnosu na neaktivnu grupu ispitanika. Istraživanje pokazuje da redovno tjelesno vježbanje ima značajan učinak na organizam čovjeka i čini važan preduslov jačanja odbrambenog imunološkog sistema što omogućava brži oporavak i lakše podnošenje simptoma bolesti COVID-19.

**Ključne riječi:** zdravlje, tjelesno vježbanje, coronavirus, COVID-19, oporavak, simptomi

## INFLUENCE OF THE LEVEL OF PHYSICAL ACTIVITY ON SYMPTOMS AND DURATION OF RECOVERY FROM COVID-19

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### ABSTRACT

Insufficient physical activity and sedentary lifestyle have exposed most of the population with chronic diseases, to higher risk of infection of COVID-19, with extremely severe consequences and exhausting and long recovery after the illness. Regular physical activity, as one way of prevention and faster recovery from COVID-19, is an important priority for improvement health and quality of life in people. The aim of this paper is to determine connection between regular physical activity of the population with the presence of symptoms and duration of recovery from COVID-19. Total number of subjects was 100 people of both genders (male 32 and female 68) of younger age (age: 30-44) without existing chronic diseases and healed from COVID. Data of regularity of exercising, symptoms and recovery period, were obtained by survey of this study: Active group of subjects (A=53) in continuity at least 3 months, two times a week, 60 minutes and Inactive group (N=47), who never exercised nor they are physically active. Chi-square test was used ( $\chi^2$  test differences between groups), in order to determine differences of extensive frequencies. Results of the research showed that there are statistically significant differences between two groups ( $p < 0.001$ ) on the behalf of group with active subjects, in terms of severity of symptoms of COVID-19 and their recovery lasted shorter than in inactive group of subjects. Study shows that regular physical exercising has significant impact on human body and is important factor of enhancing immune system, which enables faster recovery and easier dealing with symptoms of COVID-19.

**Key words:** health, physical exercising, Coronavirus, COVID-19. recovery, symptoms.

## PROJEKAT "AKTIVNA SRBIJA 2030" – KONTEKST I KONCEPT

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### APSTRAKT

U savremenom konceptu života čoveka fizička aktivnost predstavlja veoma važno pitanje, čija se korespondentnost odnosi na opšte pitanje javnog zdravlja, kao i na funkcionisanje lokalnih zajednica koje treba da obezbede osnovne preduslove za aktivan život svojih građana. Ovakvi koncepti se sve više naglašavaju u okvirima EU, ali i većeg dela sveta, tako da se može govoriti o globalnom kontekstu kvaliteta života. „Aktivni gradovi“ su jedan od projekata koji je inicirala TAFISA, a tome se aktivno pridružila i Asocijacija sport za sve Srbije, kroz kreiranje programskog dokumenta „Aktivna Srbija 2030“. Cilj rada je orijentisan ka kvalitativnoj analizi i eksplikaciji najznačajnijih odrednica ovog projekta.

**Ključne reči:** kvalitet života, fizička aktivnost, lokalna zajednica

## PROJECT "ACTIVE SERBIA 2030" – CONTEX AND COCEPT

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### ABSTRACT

In the modern concept of human life, physical activity is a very important issue, the correspondence of which refers to the general issue of public health, as well as to the functioning of local communities, which should provide the basic prerequisites for the active life of its citizens. Such concepts are increasingly emphasized within the framework of the EU, but also in the greater part of the world, so that one can talk about the global context of the quality of life. "Active cities" are one of the projects initiated by TAFISA, and the Association of Sport for All Serbia actively joined it, through the creation of the program document "Active Serbia 2030". The aim of the paper is oriented towards the qualitative analysis and explanation of the most important determinants of this project.

**Keywords:** quality of life, physical activity, local community

## RELATION BETWEEN SOME MOTOR SKILLS AND FAST RUNNING AT 60 M LOW START IN FIFTH GRADERS

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### ABSTRACT

Pupils' motor skills and motor knowledge are of great importance for quality programming as well as monitoring and evaluation in the teaching of Physical Education. The research was conducted with the aim to obtain information on the connection between a set of motor skills and motor knowledge in the 60m sprint from a low start in fifth-grade. 21 motor tests were applied to a sample of 152 pupils, aged 11 years that assessed their motor skills and one test of motor knowledge – the 60m sprint from a low start. The correlation between the set of predictor motor variables and the criterion variable of motor knowledge was determined by applying regression analysis. The results of the regression analysis indicate a statistically significant correlation between the predictor set of motor variables and the criterion variable 60m sprint from a low start. The value of the multiple correlation coefficient ( $R=0.61$ ) indicates that the variability of the criterion variable is significantly influenced by the predictor set of variables. The analysis of the partial influence of individual motor variables in defining the significance of the regression model showed a statistically significant contribution to two variables of the predictor set of motor variables, namely the variables Tapping feet against the wall ( $\beta=0.30$ ) and Polygon backwards ( $\beta=-0.28$ ). The results of this research will contribute to a better understanding of kinesiological education.

**Key words:** motor learning, Physical Education, fifth-grade pupils

## POVEZANOST MOTORIČKIH SPOSOBNOSTI I VRŠNOG ODBIJANJA IZ SREDNJEG ODBOJKAŠKOG STAVA KOD JEDANAESTOGODIŠNJIH UČENIKA

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### SAŽETAK

Istraživanje je provedeno s ciljem utvrđivanja povezanosti motoričkih sposobnosti i testa motoričkog znanja Vršno odbijanje iz srednjeg odbojkaškog stava prema planu i programu Tjelesne i zdravstvene kulture za učenike petih razreda osnovne škole. Tako je na uzorku od 152 učenika u dobi od 11 godina primijenjen skup od 21 testa motoričkih sposobnosti i test motoričkog znanja Vršno odbijanje iz srednjeg odbojkaškog stava. Rezultati regresijske analize pokazali su statistički značajnu povezanost testova za procjenu motoričkih sposobnosti s testom motoričkog znanja Vršno odbijanje iz srednjeg odbojkaškog stava kod učenika ( $R=0,58$ ). Najveći parcijalni doprinos pojedinih motoričkih varijabli u definiranju značajnosti regresijskog modela imale su varijable Bočni raskorak ( $\beta=-0,41$ ), Poligon natraške ( $\beta=-0,34$ ) i Polučučnjevi ( $\beta=0,30$ ). Rezultati istraživanja dali su korisne informacije koje su najinformativnije motoričke sposobnosti za uspješnost u izvođenju Vršnog odbijanja iz srednjeg odbojkaškog stava, a time i njegove uloge u transformaciji pojedinih motoričkih sposobnosti za postizanje željenog finalnog stanja antropoloških obilježja učenika u procesu planiranja i programiranja u nastavi Tjelesne i zdravstvene kulture. Osim toga, ukazuju i na to koje motoričke sposobnosti treba uzvažavati kako bi u procesu praćenja i vrednovanja učenici postigli što bolje rezultate kod ocjenjivanja ovog motoričkog zadatka.

**Ključne riječi:** motorička znanja, Tjelesna i zdravstvena kultura, praćenje i vrednovanje, učenici petih razreda

## CORRELATION BETWEEN MOTOR ABILITIES AND HIGH BALL SETTING FROM THE MIDDLE VOLLEYBALL POSITION IN ELEVEN-YEAR-OLD PUPILS

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### ABSTRACT

The present study was conducted with the aim of determining the correlation between motor abilities and a motor skill test High ball setting from the middle volleyball position according to the primary-school Physical Education Curriculum for fifth-graders. A set of 21 tests of motor abilities and a motor skill test High ball setting from the middle volleyball position were applied on a sample of 152 students aged 11 years. The results of a regression analysis showed a statistically significant correlation between tests for the assessment of motor abilities and the motor skill test High ball setting from the middle volleyball position in pupils ( $R=0.58$ ). The greatest partial contribution of individual motor variables in defining the significance of the regression model was made by the variables Lateral stride ( $\beta=-0.41$ ), Backwards obstacle course ( $\beta=-0.34$ ) and Semi-squats ( $\beta=0.30$ ). The results of the study provided useful information on which motor abilities are the most informative for success in performing High ball setting from the middle volleyball position, and thus its role in the transformation of individual motor abilities to achieve the desired final status of pupils' anthropological characteristics in the process of planning and programming in Physical Education. In addition, they indicate which motor abilities should be respected so that in the process of monitoring and assessment, pupils achieve the best possible results when this motor task is assessed.

**Key words:** motor skills, Physical Education, monitoring and assessment, fifth-graders

## METODE OPORAVKA U NOGOMETU

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### SAŽETAK

Metode oporavka su vrlo potrebne za ublažavanje zamora nakon utakmica, a zatim za brži povratak narušenih sposobnosti i smanjenje rizika od ozljeda. Umor nakon natjecanja je multifaktoričan i uglavnom se odnosi na dehidraciju, iscrpljivanje zaliha glikogena, oštećenje mišića i mentalni umor. Metode oporavka trebale bi biti usmjerene protiv glavnih uzroka umora. Strategije za oporavak su unos hranjivih tvari, uklanjanje u hladnu vodu, spavanje, aktivni oporavak, istezanje, nošenje kompresijske odjeće, masaža, električna stimulacija itd. Neke strategije poput hidratacije, prehrane i spavanja su djelotvorne u njihovoj sposobnosti suprotstavljanja mehanizmima umora. Konzumacija čokoladnog mlijeka nakon utakmice i obroka koji sadrže visoki glikemijski indeks ugljikohidrata i proteina unutar sat vremena nakon utakmice, učinkoviti su u nadopunjavanju potrošenih zaliha i optimiziranju regeneracije oštećenja mišića. Spavanje je bitan dio upravljanja oporavkom. Još uvijek nedostaje znanstvenih dokaza za druge metode gledajući njihovu sposobnost da ubrzaju oporavak na početnu razinu. To ne znači da te metode ne pomažu procesu oporavka, već do sada primijenjeni protokoli ne značajno ubrzavaju povratak na početne razine izvedbe.

**Ključne riječi:** oporavak, zamor, spavanje, čokoladno mlijeko, hidratacija

## METHODS OF RECOVERY IN FOOTBALL

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### ABSTRACT

Recovery strategies are highly required to alleviate post-match fatigue, and then to regain performance faster and reduce the risk of injury. Fatigue following competition is multifactorial and mainly related to dehydration, glycogen depletion, muscle damage and mental fatigue. Recovery strategies should consequently be targeted against the major causes of fatigue. Strategies for recovery are nutritional intake, cold water immersion, sleeping, active recovery, stretching, compression garments, massage and electrical stimulation etc. Some strategies such as hydration, nutrition and sleep are effective in their ability to counteract the fatigue mechanisms. Consumption chocolate milk at the end of competition and a meal containing high-glycaemic index carbohydrate and protein within the hour following the match are effective in replenishing substrate stores and optimizing muscle-damage repair. Sleep is an essential part of recovery management. Scientific evidence for other strategies reviewed in their ability to accelerate the return to the initial level of performance is still lacking. While this does not mean that these strategies do not aid the recovery process, the protocols implemented up until now do not significantly accelerate the return to initial levels of performance.

**Key words:** recovery, fatigue, sleep, chocolate milk, hydration



## AKTIVNE STARIJE OSOBE NEMAJU STATISTIČKI ZNAČAJNU ASIMETRIJU UOČENIH PARAMETARA RAVNOTEŽE

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### SAŽETAK

Cilj ovog rada je bio utvrditi statistički značajnu asimetriju u ravnotežnim parametrima kod aktivnih osoba starije **životne** dobi. Uzorak ispitanika u ovom radu sastojao se od 70 aktivnih umirovljenika prosječne dobi  $65,40 \pm 5,68$  godina. Svi ispitanici aktivno su uključeni u specijalizirani program vježbanja za umirovljenike koji se provodi u sklopu Sokol Centra Osijek. Specijalizirani program vježbanja za umirovljenike sastoji se od različitih vježbi kojima je cilj razvoj i održavanje propriocepcije, kinestezije, jakosti i kontrole pokreta. Navedeni parametri izuzetno su važni kod starije populacije jer se njihovim pravilnim razvojem i održavanjem mogu značajno prevenirati padovi te poboljšati kvaliteta **života**. Statička ravnoteža se testirala uz pomoć Gyko senzora na način da se uređaj postavio ispitanicima na leđa, te je testirana ravnoteža otvorenim i zatvorenim očima. Ispitanici su izvodili jednaki zadatak odizanja jedne pa druge noge od podloge. Rezultati Wilcoxon Matched pairs testa ukazuju na postojanost statistički značajnih razlika između proprioceptijskog testa ravnoteže i kinestetijskog testa lijeve i desne noge. Statistički značajne razlike nisu utvrđene između istog testa između lijeve i desne noge. Nepostojanje statistički značajne razlike između rezultata desne i lijeve noge u ravnotežnim parametrima je poželjno s obzirom da velike asimetrije između tjelesnih segmenata mogu predstavljati rizik za ozljedu koja kod starije populacije može izrazito smanjiti kvalitetu **života**. Rezultati ukazuju na postojanje efekta tjelesnog vježbanja kod aktivnih umirovljenika kada govorimo o parametru ravnotežne asimetrije. Trenažni proces pozitivno utječe na njihovu bilateralnost tijela, što ukazuje na dobro konstruiran trening za osobe starije populacije.

**Ključne riječi:** umirovljenici, ravnoteža, asimetrija, padovi

## ACTIVE ELDERLY DO NOT HAVE STATISTICALLY SIGNIFICANT ASYMMETRY OF OBSERVED BALANCE PARAMETERS

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### ABSTRACT

The aim of this study was to determine statistically significant asymmetry in balance parameters in active elderly people. The sample of respondents in this paper consisted of 70 active retirees with an average age of  $65.40 \pm 5.68$  years. All respondents are actively involved in a specialized exercise program for retirees, which is carried out as part of the Sokol Center Osijek. A specialized exercise program for retirees consists of various exercises aimed at developing and maintaining proprioception, kinesthesia, strength and movement control. The mentioned parameters are extremely important for the elderly population, because their proper development and maintenance can significantly prevent falls and improve the quality of life. Static balance was tested with the help of the Gyko sensor in such a way that the device was placed on the examinee's back, and balance was tested with open and closed eyes. The subjects performed the same task of lifting one leg and then the other off the floor. The results of the Wilcoxon Matched pairs test indicate the persistence of statistically significant differences between the proprioception balance test and the kinesthetic test of the left and right legs. No statistically significant differences were found between the same test between the left and right legs. The absence of a statistically significant difference between the results of the right and left leg in the balance parameters is desirable, considering that large asymmetries between body segments can represent a risk for injury, which in the elderly population can significantly reduce the quality of life. The results indicate the existence of the effect of physical exercise in active retirees when we talk about the balance asymmetry parameter. The training process has a positive effect on their bilaterally of the body, which indicates a well-constructed training for the elderly population.

**Key words:** elderly, balance, asymmetry, falls

## STAKEHOLDER PERCEPTIONS OF THE PROFESSIONAL PROFILE OF SPORTS KINESIOLOGIST

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### ABSTRACT

In Italy, recent amendments to Legislative Decree n. 36 of 28 February 2021, on sports work, may have made the application of the reform by stakeholders unclear, with the risk of generating further confusion among them. One of the most critical points concerns the possible equivalencies to the professional profile of the kinesiologist, which would be illegitimately recognized even for a different level of education, contrary to the requirements of the European qualification framework. The aim of the study was to understand the perceptions of stakeholders in the world of non-professional football regarding recent legislative provisions. A survey was administered to 50 trainers of non-professional football associations of the province of Salerno. The first section presents five items which seek to probe stakeholders' perceptions of the enjoyment, appropriateness, usefulness, and scientificity of kinesiologists. In the second section, they were asked to self-assess their technical, methodological, scientific skills. A chi-square analysis ( $\chi^2$ ) was performed to test the independence within and between-subjects on their perceptions about the new working professional profile of sports kinesiologist. From the results, it was possible to appreciate a discordance of opinion among stakeholders. Although most trainers were in favour of introducing such a professional profile ( $p < 0.05$ ), contradictions emerge concerning the contribution the new professional profile can make in practice ( $p > 0.05$ ). The perceptual contradictions found among stakeholders' responses demonstrate how the complexity of recent regulatory provisions regarding possible equivalencies to the title of kinesiologist have inevitably generated further confusion among stakeholders.

Keywords: sports science and exercise; trainers; sports law; professional sport profile

## ATTITUDES OF STUDENTS TOWARDS PHYSICAL EDUCATION IN RELATION TO PARENTS' EDUCATION

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### ABSTRACT

Attitudes in everyday life play a significant role in human behavior and functioning. They influence our behavior both on a private and business level. They also influence the behavior of students in physical education classes in a positive and negative sense. In previous researches, one-component, two-component and three-component models were used. **PURPOSE:** The aim of this paper was to determine are there any differences between the attitudes of students towards Physical education in relation to the education level of their parents. **METHODS:** The research was conducted on 365 students of the 1st and 2nd year using the STZK36 scale to assess the attitude towards Physical education. Basic statistics of variables were calculated and Kruskal-Wallis ANOVA was performed. **RESULTS:** Students have moderately positive attitudes towards Physical education in all attitude components. Analysis of variance did not show statistically significant differences between the attitudes of the groups. **CONCLUSION:** The differences between the attitudes of students in relation to the level of their parent education were not statistically significant, so it could be concluded that the level of education of parents does not influence the formation of different opinions about Physical education.

**Keywords:** Physical education, students, attitudes, level of education

## STAVOVI STUDENATA PREMA TJELESNOJ I ZDRAVSTVENOJ KULTURI U ODNOSU NA OBRAZOVANJE RODITELJA

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### SAŽETAK

Stavovi u svakodnevnom životu igraju značajnu ulogu u ljudskom ponašanju i funkcioniranju. Utječu na naše ponašanje kako na privatnom tako i na poslovnom planu. Također utječu na ponašanje studenata na nastavi TZK u pozitivnom i negativnom smislu. U istraživanjima su se koristili jednokomponentni, dvokomponentni i trokomponentni modeli.

**SVRHA:** Cilj ovog rad bio je utvrditi postoje li razlike među stavovima studenata prema TZK u odnosu na razinu obrazovanje roditelja.

**METODE:** Istraživanje je provedeno na 365 studenata 1. i 2. godine Pomorskog fakulteta u Splitu koristeći ljestvicu STZK36 za procjenu stava prema TZK. Izračunate su osnovne statistike varijabli te je izvršena Kruskal-Wallis ANOVA.

**REZULTATI:** Studenti čiji su roditelji imali nisku i srednju razinu obrazovanja imaju umjereno pozitivne stavove prema TZK u svim komponentama stava. Studenti čiji roditelji imaju višu i visoku razinu obrazovanja imaju nešto nižu vrijednost stavova u bihevioralnoj komponenti stava. Analiza varijance nije pokazala statistički značajne razlike među stavovima grupa. **ZAKLJUČAK:** Razlike među stavovima studenata u odnosu na razinu obrazovanja roditelja se nisu pokazale statistički značajne sto bi se moglo zaključiti da razina obrazovanja roditelja ne utječe na formiranje različitog mišljenja vezano za TZK.

**Ključne riječi:** Tjelesna i zdravstvena kultura, studenti, stavovi, razina obrazovanja

## UČESTALOST DEFORMITETA STOPALA KOD UČENIKA MLADIH RAZREDA OSNOVNE ŠKOLE

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### APSTRAKT

Cilj istraživanja je utvrđivanje učestalosti deformiteta stopala kod učenika četvrtog razreda osnovne škole. Uzorak istraživanja činilo je 124 učenika osnovne škole „Dimitrije Tucović“ u Kraljevu (Republika Srbija) uzrasta 10 godina ( $\pm 6$  meseci). Ispitanici su podeljeni u dva subuzorka. Prvi subuzorak su činile 62 devojčice, a drugi subuzorak 62 dečaka. Prilikom merenja statusa svoda stopala korišćen je digitalni kompjuterski podoskop (SupOrt). Statistička obrada podataka izvršena je u SPSS23 i obuhvatala je izračunavanje učestalosti deformiteta stopala, procenat zastupljenosti deformiteta stopala (%) i izračunavanje razlika između polova uz pomoć Hi kvadrat testa ( $\chi^2$  test). Rezultati dobijeni istraživanjem pokazuju da postoji visok procenat dece koja imaju deformitet stopala. Kao najdominantiji deformitet pojavljuje se četvrti stepen spuštenosti svoda stopala, koji je zabeležen kod 88.7% devojčica i 91.9% dečaka. Izdubljeno stopalo zabeleženo je kod 8.1% devojčice i 6.5% dečaka. Analizom vrednosti  $\chi^2$  testa i njegove statističke značajnosti, uočeno je da nisu prisutne statistički značajne razlike između statusa svoda stopala, ni u korist devojčica, ni u korist dečaka.

**Ključne reči:** *deformitet stopala, osnovna škola, pes cavus, pes planus, učenici*

## FREQUENCY OF FOOT DEFORMITY IN PRIMARY SCHOOL PUPILS

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### ABSTRACT

The aim of the research is to determine the frequency of foot deformities in fourth-grade elementary school pupils. The research sample consisted of 124 pupils of the "Dimitrije Tucović" elementary school in Kraljevo (Republic of Serbia) aged 10 years ( $\pm 6$  months). The respondents were divided into two subsamples. The first subsample consisted of 62 girls, and the second subsample consisted of 62 boys. Digital computer podoscope (SupOrt) was used for measuring the status of the arch of the feet. Statistical data processing was performed in SPSS23 and included the calculation of the frequency of foot deformities, the percentage of foot deformities (%) and the calculation of differences between the sexes with the help of the Chi square test ( $\chi^2$  test). The results of the research show that there is a high percentage of children who have foot deformities. As the most dominant deformity, the fourth degree of lowered arch of the foot appears, which was recorded in 88.7% of girls and 91.9% of boys. Hollow foot were recorded in 8.1% of girls and 6.5% of boys. By analyzing the value of the  $\chi^2$  test and its statistical significance, it was observed that there are no statistically significant differences between the foot arch status, neither in favor of girls, nor in favor of boys.

**Keywords:** *foot deformities, elementary school, pes cavus, pes planus, pupils*

## RELATION OF COGNITIVE ABILITIES AND AGILITY IN EARLY PUBESCENT BOYS AND GIRLS

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### ABSTRACT

Agility is a crucial factor of success in many sports. It has reactive (RAG) and non-reactive component (CODS). CODS is more connected with power while RAG is more connected with cognitive capacities of the athlete. Apart from sport, agility is very common in everyday children physical activity. Yet, there is an evident lack of studies dealing with agility among children, specifically of its' cognitive aspect. Hence, this study aims to establish relations of cognitive abilities and agility in early pubescent boys and girls. Primary school boys (n=22) and girls (n=20), aged  $14.86 \pm 0.32$  years, participated in the study. Cognitive abilities of children were assessed with Stroop test. Along with basic anthropometric indices and power motor abilities (jumping and sprinting performance), agility was assessed with 20-yard test, and newly developed Triangle agility test. Results showed difference between gender in power abilities, morphology and maturity status (MO). No differences were noticed between cognitive Stroop test variables and CODS and RAG performance. It was concluded that early pubescent girls and boys use different capacities during agility performance tasks. Girls rely more on cognitive and boys more on power abilities during agility performance.

**Keywords:** correlations, reactive agility, elementary school, children, power

## ORGANIZACIJA GODIŠNJEG PROGRAMA ZA PREDŠKOLSKI I ŠKOLSKI SPORT- „VRTIĆIJADA“

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### SAŽETAK

Okruženje u kojem današnja deca odrastaju, zasigurno je drugačije u odnosu na vreme od pre samo 20 ili 30 godina. Ako je nekad akcenat bio na pokretnim igrama, koje su se održavale napolju po svim vremenskim prilikama, danas je sasvim suprotno: tv, internet, kompjuteri i telefoni su zaokupili pažnju dece, pa samim tim i njihova potreba za kretanjem je sve manja. Iako budućnost u tom smislu ne izgleda sjajno, ne treba sedeti skrštenih ruku, naprotiv, treba učiniti sve da se toj istoj deci pokret, sa svim svojim pozitivnim efektima, približi i učini dostupnijim. Stručnjaci koji rade sa decom, bilo da su vaspitači, nastavnici i treneri, upravo imaju tu mogućnost. Primenom različitih kinezioloških aktivnosti, primerenih njihovim uzrasnim karakteristikama, potrebno je decu zainteresovati i omogućiti da uživaju u njima. Najbolji način za to je igra, koja treba da bude osnova svih ostalih aktivnosti. Takođe, naučna istraživanja konstantno potvrđuju činjenice, da su deca sve manje fizički aktivna. Sa druge strane i njihovi roditelji imaju sve manje slobodnog vremena, koje bi kvalitetno proveli sa svojim mališanima. Obzirom da deca provode skoro polovinu dana u vrtićima i školama, jedno od rešenja za veću fizičku aktivnost dece je i organizacija godišnjih programa iz oblasti predškolskog i školskog sporta. Kao primer dobre prakse u ovom radu će biti opisana organizacija godišnjeg programa pod nazivom „Vrtićijada“, čiji je nosilac Sportsko udruženje „Super aktivan“ iz Novog Sada, a podržan je od Gradske uprave za sport i omladinu Novog Sada.

**Ključne reči:** vrtićijada, predškolska deca, organizacija, manifestacija

## ORGANIZATION OF THE ANNUAL PROGRAM FOR PRE-SCHOOL AND SCHOOL SPORTS - “VRTICIJADA”

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### ABSTRACT

The environment in which children grow up today is certainly different compared to the time just 20 or 30 years ago. If once the emphasis was on mobile games, which were held outside in all weather conditions, today it is quite the opposite: TV, Internet, computers and phones have captured the attention of children, and therefore their need for movement is decreasing. Although the future does not look bright in this sense, we should not sit idly by, on the contrary, we should do everything to bring the movement, with all its positive effects, closer and more accessible to those same children. Experts who work with children, whether they are educators, teachers or coaches, have exactly that opportunity. By applying various kinesiology activities, appropriate to their age characteristics, it is necessary to interest children and enable them to enjoy them. The best way to do this is through play, which should be the basis of all other activities. Also, scientific research constantly confirms the fact that children are less and less physically active. On the other hand, their parents have less and less free time, which they could spend quality time with their little ones. Considering that children spend almost half of the day in kindergartens and schools, one of the solutions for greater physical activity of children is the organization of annual programs in the field of preschool and school sports. As an example of good practice, this paper will describe the organization of the annual program called “Vrtićijada”, which is sponsored by the Sports Association “Super Active” from Novi Sad, and is supported by the City Administration for Sports and Youth of Novi Sad.

**Key words:** kindergarten, preschool children, organization, manifestation

## THE IMPORTANCE OF SPORT FOR PERSONS WITH DISABILITIES WITH THE AIM OF HEALTH PROMOTION

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### ABSTRACT

Health is a fundamental value and a precondition for a productive life, both for the individual and for society in the socio-economic sense. In today's society, sport is generally accepted, regardless of whether it is part of recreational activities or an activity in which top results are achieved. The basis of every sports activity is physical activity, which has a number of positive benefits for human health. This is supported by the importance of agreement signing between the United Nations Office and the World Health Organization, which is aimed at raising public awareness of the benefits that sport brings for a healthy life.

Persons with whom a limitation is identified, physical, mental or sensory, physical activity in the form of sports can contribute to better rehabilitation and social integration. The question is whether the promotion of health through sports is equally represented in the population of people with disabilities. Regardless of the policies, the promotion of health through sports is enabled to all members of society, in a declarative sense, through regulations and social norms. It is necessary to consider all the factors that lead to the differences that occur between persons who do not have any type of disability and persons with disabilities when it comes to participation in sports, media coverage of sports, communication, education of experts in sports, and even prejudices about the possibility of including people with disabilities in sports.

**Keywords:** people with disabilities, sports, inclusion, health, promotion.



## PHYSICAL PERFORMANCE AND DIDACTICS OF MOTOR ACTIVITIES IN EXERCISE AND SPORT SCIENCES BACHELOR'S DEGREE STUDENTS

**Felice di Domenico**

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### **ABSTRACT**

In Italy, recommended levels of physical activity are not achieved according to WHO recommendations. This situation could be generated by the wrong choice by movement professionals of correct teaching methodology. The aim of the research is to quantify levels of physical and sporting activity of students at the University of Salerno through the administration of a questionnaire and to identify possible associations between level of physical activity and approach used in gyms.

The sample is represented by 56 students at the University of Salerno (22.21±1.96 years). Through Google Forms platform, a questionnaire was administered consisting of questions regarding physical activity performed per week. An association was sought between two questions: "Do you currently practice physical activity or sports on an ongoing basis?" with the answer "Yes/No" and "The motor or sports activity should be: 1. totally managed by the instructor/coach who is in charge of scheduling the individual training sessions after an initial or periodic evaluation; 2. characterized by sessions agreed together with the instructor/coach".

44.6% of students use cars to get around. Only 14.3% of the sample traveled from one place to another on foot for all 7 days. 66% answered that they practiced physical activity or sports on an ongoing basis. The chi-square test revealed statistically significant associations between the answers to the question "Do you currently practice physical activity or sports on an ongoing basis?" and the type of approach proposed by gyms ( $p < 0.05$ ), highlighting that non-practitioners do not prefer methodologies that are too prescriptive.

**Keywords:** Sedentary lifestyle, physical activity and health, learning approaches, physical activity intensity, physical performance

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## ALTERNATIONS IN NEUROENDOCRINE SYSTEM IN RESPONSE TO PHYSICAL EXERCISE

Ljubica Gavrilović<sup>1</sup>, Vesna Stojiljković<sup>1</sup>, Stanimir Stojiljković<sup>2</sup>, Snežana Pejić<sup>1</sup>, Snežana B. Pajović<sup>1</sup>

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### ABSTRACT

In recent years physical activity has been used for therapeutic and preventive purposes in a series of diseases including depression, diabetes, obesity, and cardiovascular diseases. Exercise is a physical stress that causes an imbalance in the sympatho-adrenomedullary system (SAMS) and sympathetic nervous system (SNS). For this reason, the secretion of stress hormones and neurotransmitters is necessary to restore the balance of these systems. Catecholamines are important mediators of stress response. This study tested the effect of 8-week endurance training programs (running 3 times per week, duration between 30 and 60 minutes, in the intensity zone between ventilatory thresholds 1 and 2) in 42 male students of Faculty of Sport and Physical Education on the plasma level of catecholamine. Blood was sampled from young healthy men before and after the running program. Plasma adrenaline (A) and noradrenaline (NA) concentrations were determined using 3-CAT Research ELISA kits. The 8-week endurance training program decreased the level of A by 37% and increased the level of NA by 95% in the range of reference values and made organism more prepared for the new challenge. In addition, after the 8 weeks of endurance running program maximal oxygen uptake (VO<sub>2</sub>max) increased by 17% in comparison with the initial values. Based on these findings, it may be concluded that 8 weeks of endurance training, 3 running times per week, duration between 30 and 60 minutes, may be effectively used to the fine-tuning homeostasis of the neuroendocrine system, which can be useful for preventing diseases caused by stress.

**Key Words:** endurance training, adrenaline, noradrenaline, blood, male students

## SPECIFIC FUNCTIONAL SWIMMING CAPACITIES OF YOUTH WATER POLO PLAYERS IN DIFFERENT PLAYING POSITIONS

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### ABSTRACT

**Introduction:** Water polo is a highly demanding physical team sport taking place in water. Players use different swimming techniques to accomplish different technical-tactical actions, receiving, dribbling and passing the ball, as well as shooting accurately on the goal, while wrestling with the opponents. The aim of this study was to determine the differences in specific functional swimming capacities between youth water polo players in different playing positions.

**Methods:** There were 174 youth water polo players who attended the Croatian Water Polo Federation training camps included in this cross-sectional study. Measurements included anthropometric characteristics and specific functional swimming capacities – 25 m crawl, 50 m crawl, 100 m crawl, 400 m crawl and 25 m ball dribbling.

**Results:** Out of 174 youth water polo players participating in this study there were 46 (26.4%) center defenders, 31 (17.8%) centers, 74 (42.5%) perimeter players and 23 (13.2%) wings. (N=31) presented higher body height and weight than perimeter players (N=74) and wings.

There were no statistically significant differences in specific functional swimming tests between players in different playing positions.

**Conclusion:** Results of the current study contribute to the specific knowledge about youth water polo players' specific functional swimming capacities according to their playing positions. Still, such specialization by playing positions in water polo should be postponed until the age of 15 or 16 years old and youth players should be practicing ability to play in different positions in the early age, in order to become elite all-round water polo players.

**Keywords:** water polo, playing positions, swimming, performance

## STAVOVI ISPITANIKA- OVISNIKA O SPORTU I SPORTSKIM AKTIVNOSTIMA U TERAPIJSKOJ ZAJEDNICI „KAMPUS“

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<sup>3</sup>TZ „Kampus“, Rakovica, Sarajevo, Bosna i Hercegovina

### SAŽETAK

Istraživanje je provedeno na ukupnom uzorku od 30 ispitanika-ovisnika oba pola, starosne dobi od 25 do 40 godina ( $M=13$ ;  $\bar{Z}=17$ ) koji se nalaze na tretmanu u terapijskoj zajednici „Kampus“ u Rakovici. Osnovni cilj istraživanja odnosio se na utvrđivanje stavova (mišljenja) ispitanika-ovisnika o ulozi i doprinosu sporta i sportskih aktivnosti njihovom zdravstvenom stanju, resocijalizaciji, zbližavanju, podruštvljenosti i međusobnoj saradnji u terapijskoj zajednici „Kampus“. U cilju sveobuhvatnijeg definisanja potencijalno zanimljivih stavova i mišljenja ispitanika-ovisnika koji se nalaze na tretmanu u terapijskoj zajednici „Kampus“, konstruisan je anketni upitnik – Mišljenje o sportu sa 15 pitanja - tvrdnji, po modelu Likertove skale pri čemu je svaka tvrdnja označena sa 5 modaliteta od, uopšte se ne slažem, djelimično se slažem, slažem se, uglavnom se slažem, potpuno se slažem.

Na osnovu dobijenih rezultata iz distribucije frekvencija stavova (mišljenja) ispitanika-ovisnika o ulozi i doprinosu sporta i sportskih aktivnosti njihovom zdravstvenom stanju, resocijalizaciji, zbližavanju, podruštvljenosti i međusobnoj saradnji u terapijskoj zajednici „Kampus“ može se konstatovati da ispitanici-ovisnici imaju pozitivan stav o ulozi i doprinosu sporta i sportskih aktivnosti njihovoj resocijalizaciji, zbližavanju, podruštvljenosti i međusobnoj saradnji koji se planski sprovi u terapijskoj zajednici „Kampus“.

**Ključne riječi:** *ispitanici-ovisnici, sport i sportske aktivnosti, stavovi, upitnik*

## ATTITUDES OF RESPONDENTS-ADDICTS ON SPORTS AND SPORTS ACTIVITIES IN THE THERAPY COMMUNITY “KAMPUS”

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### SUMMARY

The research was conducted on a total sample of 30 respondents-addicts of both sexes, aged 25 to 40 years ( $M=13$ ;  $F=17$ ) who are undergoing treatment in the therapeutic community “Kampus” in Rakovica. The main goal of the research was to determine the attitudes (opinions) of the respondents-addicts about the role and contribution of sports and sports activities to their health condition, resocialization, rapprochement, sociability and mutual cooperation in the therapeutic community “Kampus”. In order to more comprehensively define the potentially interesting attitudes and opinions of the respondents-addicts who are undergoing treatment in the “Kampus” therapeutic community, a questionnaire was constructed. Opinion on sport with 15 questions - statements, according to the Likert scale model, where each statement is marked with 5 modalities of, do not agree at all, partially agree, agree, mostly agree, completely agree.

Based on the results obtained from the frequency distribution of the attitudes of the respondents-addicts about the role and contribution of sports and sports activities to their health condition, resocialization, rapprochement, sociability and mutual cooperation in the therapeutic community “Kampus”, it can be concluded that the respondents-addicts have a positive attitude about the role and contribution of sports and sports activities to their resocialization, rapprochement, sociability and mutual cooperation, which is planned in the therapeutic community “Kampus”.  
Keywords: respondents-addicts, sport and sports activities, attitudes, questionnaire

## PRAĆENJE FIZIOLOŠKIH KARAKTERISTIKA I FUNKCIONALNIH SPOSOBNOSTI KARATE SPORTISTA, INTERVALNIM METODOM TRENINGA

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vaspitanje, sport i zdravlje, Skoplje, S. Makedonija

### ABSTRACT

Težnja ka postizanju što boljih rezultata u sportu dovodi do uvođenja novih sredstava i metoda, kao i do unapređenja postojećih. Proces postizanja vrhunskih sportskih rezultata se sve više zasniva na naučnim istraživanjima i metodama, utvrđujući faktore koji utiču na postizanje uspjeha i postizanje vrhunskih sportskih rezultata. Uspjeh u bilo kojem sportu, pa tako i u karateu, ovisi o zajedničkom djelovanju više faktora: tehnike, taktike, brzine donošenja odluka i mentalnih sposobnosti. Da bi ceo taj sistem normalno funkcionisao, u velikoj meri zavisi od fizioloških karakteristika i funkcionalnih sposobnosti karatista. Istraživanje je sprovedeno na uzorku od 31 muškog subjekta iz populacije karatista, potencijalnih predstavnika uzrasnih kategorija mlađih seniora (U21) i seniora Republike Makedonije. Osnovni cilj istraživanja je utvrđivanje promjena koje se javljaju u fiziološkim karakteristikama i funkcionalnim sposobnostima starijih karatista. Dobijeni rezultati istraživanja statistički su obrađeni i za svaku varijablu posebno su izračunati osnovni deskriptivni, statistički parametri; aritmetička sredina, standardna devijacija, koeficijent varijabilnosti. Za utvrđivanje razlika između dva mjerenja primijenjen je t-test za male zavisne uzorke. Analizom dobijenih rezultata utvrđene su određene razlike u fiziološkim karakteristikama i funkcionalnim sposobnostima karatista između predtakmičarskog i takmičarskog perioda.  
**Ključne riječi:** karate, praćenje, intervalni trening

## MONITORING OF THE PHYSIOLOGICAL CHARACTERISTICS AND FUNCTIONAL ABILITIES IN KARATE ATHLETES, USING THE INTERVAL METHOD OF WORK

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### ABSTRACT

The aspiration to achieve better results in sports leads to the introduction of new means and methods, as well as the improvement of existing ones. The process of achieving top sports results is increasingly based on scientific research and methods, determining the factors that influence the achievement of success and the achievement of top sports results. Success in any sport, including karate, depends on the joint action of several factors: technique, tactics, decision-making speed and mental abilities. In order for that whole system to function normally, it largely depends on the physiological characteristics and functional abilities of karate athletes. The research was conducted on a sample of 31 male subjects drawn from the population of karate athletes, potential representatives of the age categories of U21 and seniors of the Republic of Macedonia. The main goal of the research is to determine the changes that occur in the physiological characteristics and functional abilities of senior karate athletes. The obtained results of the research were statistically processed, and the basic descriptive, statistical parameters were calculated separately for each variable, arithmetic mean, standard deviation, coefficient of variability. To determine differences between two measurements, a t-test for small dependent samples was applied. By analyzing the obtained results, certain differences in the physiological characteristics and functional abilities of the karate athletes between the pre-competition and the competition period have been determined.  
**Keywords:** karate, monitoring, interval training

## ODNOS FIZIČKE SPREMNOSTI I BIOLOŠKE KARAKTERISTIKE DJECE RANOG ŠKOLSKOG UZRASTA

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### APSTRAKT

Praćenje fizičke spremnosti je snažan pokazatelj zdravstvenog stanja kako u djetinjstvu, tako i u adolescenciji i odrasloj dobi. Identifikovanje faktora koji mogu uticati na nivo fizičke spremnosti u djetinjstvu ili adolescenciji je važno i treba ga istraživati uporedo sa njegovog praćenja.

Cilj istraživanja je utvrditi povezanost fizičke spremnosti djece ranog školskog uzrasta od 6 do 10 godina sa biološkim karakteristikama, vremenom dojenja i porođajnom težinom kod djece.

Istraživanje je sprovedeno na uzorku od 940 ispitanika, uzrasta od 6 do 10 godina, izabranih po slučajnom izboru iz nekoliko osnovnih škola u regionu Skoplja. Uzorak je podeljen u dva poduzorka prema polu, 466 ispitanika muškog pola i 474 ispitanica od ženskog pola.

Razlike između grupa utvrđene su jednofaktor-skom multivarijantnom i univarijantnom analizom kovarijanse (MANKOVA i ANKOVA) uz parcijalizaciju po godinama. Rezultati istraživanja ne ukazuju na jasnu vezu između konzumiranja majčinog mlijeka (vrijeme dojenja) i testova za procjenu fizičke spremnosti (motoričkog statusa) kod ispitanika oba pola.

Dječaci normalne i povećane porođajne težine pokazuju bolje rezultate u nekim motoričkim testovima. Dok u slučaju djevojčica takva veza nije utvrđena

**Ključne reči:** deca; fizički fitness; težina rođenja; vreme na dojenje

## THE RELATIONSHIP OF PHYSICAL FITNESS AND THE BIOLOGICAL CHARACTERISTICS OF CHILDREN OF EARLY SCHOOL AGE

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### ABSTRACT

Tracking physical fitness is a powerful indicator of health status both in childhood, adolescence and adulthood Identifying factors that may influence the level of physical fitness in childhood or adolescence is important and should be investigated in parallel with its monitoring.

The aim of the research is to determine the connection between physical fitness in children of early school age from 6 to 10 years and biological characteristics, breastfeeding time and birth weight in children. The research was conducted on a sample of 940 respondents, aged 6 to 10, randomly selected from several elementary schools in the Skopje region. The sample was divided into two subsamples according to gender, 466 male respondents and 474 female respondents.

Differences between groups were determined by one-factor multivariate and univariate analysis of covariance (MANKOVA and ANKOVA) with partialization by age.

The results from the research no indicate on clear connection between consumption on the mother's milk (time on breastfeeding) and the tests for estimating on the physical fitness (motor status) among respondents of both sexes .

Boys of normal and increased birth weight show better results in some motor tests. While at the girls no it was established such connection

**Keywords :** children; physical fitness; birth weight; breastfeeding time.

## STRUČNO USAVRŠAVANJE I EMOCIONALNE KOMPETENCIJE NASTAVNIKA

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### SAŽETAK

Pitanje stručnog usavršavanja nastavnika danas je vjerovatno od presudnog značaja u kreiranju obrazovanja koje može udovoljiti potrebama vremena u kojem živimo, prvenstveno iz razloga što su promjene, koje se u svim sferama ljudske djelatnosti dešavaju, toliko ubrzane da ih obrazovni sistemi nisu u stanju pratiti. Od same kvalitete stručnog usavršavanja nastavnika u mnogome će ovisiti i njihove nastavničke kompetencije. Naime, u empirijsko eksperimentalnom istraživanju sa paralelnim grupama nastavnika, nastojali smo utvrditi u kojoj mjeri stručno usavršavanje utiče na emocionalne kompetencije nastavnika. Pri tome se, stručno usavršavanje nastavnika za interaktivnu nastavu, nenasilnu komunikaciju i responsibilnu interakciju, sa prvom eksperimentalnom grupom nastavnika realiziralo interaktivno, sa drugom na tradicionalan (predavački) način, a treća grupa nastavnika je bila kontrolna, pri čemu su u analizu uzeti rezultati inicijalnog i finalnog ispitivanja. Rasvjetljavana su ključna obilježja sljedećih procesa i dinamizama: interaktivnog stručnog usavršavanja nastavnika i uticaja na njihove emocionalne kompetencije u odnosu na tradicionalno stručno usavršavanje. Dobijeni rezultati pokazuju da ne postoji statistički značajna razlika u samoprocjeni nastavničkih emocionalnih kompetencija u odnosu na inicijalno ispitivanje i nastavnike kontrolne grupe, kao i da nema statistički značajne razlike u odnosu na nastavnike koji su se usavršavali na „tradicionalan“ način. Sintezom interdisciplinarnih naučnih saznanja i nalaza empirijskog istraživanja, identificirane su razvojne perspektive interaktivnog stručnog usavršavanja nastavnika za interaktivnu nastavu, nenasilnu komunikaciju i responsibilnu interakciju kao i mogući efekti njihovog uticaja na nastavničke emocionalne kompetencije.

**Ključne riječi:** stručno usavršavanje nastavnika, emocionalne kompetencije, interaktivna nastava, nenasilna komunikacija, responsibilna interakcija.



## PROFESSIONAL DEVELOPMENT AND EMOTIONAL COMPETENCES OF TEACHERS

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### ABSTRACT

The issue of professional training of teachers today is probably of crucial importance in the creation of education that can meet the needs of the times we live in, primarily because the changes occurring in all spheres of human activity are so accelerated that educational systems are unable to keep up with them. Their teaching competence will largely depend on the quality of professional training of teachers. Namely, in an empirical experimental study with parallel groups of teachers, we tried to determine to what extent professional development affects the emotional competence of teachers. At the same time, the professional training of teachers for interactive teaching, non-violent communication and responsible interactions was realized interactively with the first experimental group of teachers, with the *second* in a traditional (lecture) way, and the third group of teachers was a control, whereby the results of the initial and final examination. The key features of the following processes and dynamics were highlighted: interactive professional development of teachers and the impact on their emotional competences in relation to traditional professional development. The obtained results show that there is no statistically significant difference in the self-assessment of teachers' emotional competences in relation to the initial examination and the teachers of the control group, as well as that there is no statistically significant difference in relation to the teachers who trained in the "traditional" way. Through the synthesis of interdisciplinary scientific knowledge and findings of empirical research, the development perspectives of interactive professional development of teachers for interactive teaching, non-violent communication and responsible interaction, as well as the possible effects of their influence on teachers' emotional competences, were identified.

**Keywords:** professional development of teachers, emotional competences, interactive professional development of teachers, interactive teaching, non-violent communication, responsible interaction.

## INTERKORELACIJA STEPENA ZRELOSTI I ESTETSKIH KOREKTIVNIH ZAHVATA KOD MLADE POPULACIJE – REALNE POTREBE ILI TREND

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### APSTRAKT

Realnim osvrtom, uočava se sve više mladih lica koja otkrivaju u javnosti svoje estetske korekcije. Postavlja se pitanje koji su to faktori koji ih podstiču da ih koriste. Važno je posmatrati unutrašnje i vanjske razloge kojima se mladi vode kroz potrebe za estetskim korekcijama. Činjenica da su u današnjem okruženju prisutni i dostupni razni oblici estetskih korekcija, takođe je ponuda navedenih usluga u značajnoj ekspanziji što je aktivno praćeno marketingom. Marketing svojim porukama utiče na javnost i formiranje mišljenja. Mediji kao dio marketinga plasiraju ono što je u trendu a sa druge strane ono što je u trendu izaziva kod proizvođača, institucija i klinika da svoje poruke prenose apelujući na važnost izgleda. U svijetu postoji i obrnuti trend u kojem poznati apeluju na prirodnost i duhovnost kao stil života prihvatanja sebe iznutra i spolja.

Opravdano je postaviti istraživačko pitanje i naučnim pristupom obrazložiti šta uzrokuje estetske korekcije kod mlađih lica, da li su to stvarne potrebe ili je u pitanju trend koji podrazumijeva vanjske razloge zbog kojih mladi ljudi svih dobnih grupa biraju da uljepšavaju svoj spoljašnji izgled. Statistička analiza ima zadatak da ispita populaciju i da zaključke i sudove preoblikuje u zakonitosti.

**Ključne riječi:** inferencijalna statistička analiza, interkorelacija, estetska korekcija, psihologija marketinga

## INTERCORRELATION OF DEGREE OF MATURITY AND AESTHETIC CORRECTIVE PROCEDURES IN YOUNG POPULATION - REAL NEEDS OR TREND

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### ABSTARCT

Realistic review, there are more and more young people who reveal their aesthetic corrections in public. The question rises as to what are the reasons that encourage them to do so. It is important to observe the internal and external reasons that guide young people in choosing aesthetic correction.

The fact is that in the environment, corrective procedures are available in a significant expansion, accompanied by marketing. Marketing messages have influence on public opinion. Media as part of marketing, has a great influence on what is currently trending.

The current trend is the great influence of external appearance.

It is justified to ask a research question and scientifically explain, what influences the choice of aesthetic correction among young people. Are these a real needs or is it a current trend?

**Keywords:** inferential statistical analysis, intercorrelation, aesthetic correction, marketing psychology

## ISPITIVANJE POUZDANOSTI PRIMJENE FEMBAF TESTA KOD OSOBA STARIJE ŽIVOTNE DOBI

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### SAŽETAK

FEMBAF test (Fast evaluation of mobility, balance, and fear) je sveobuhvatni alat za identifikaciju osoba starije životne dobi koji su izloženi riziku od pada. Koristi se za brzu procjenu pokretljivosti, ravnoteže i straha od pada. S tim u vezi osnovni cilj istraživanja odnosio se na identifikaciju osoba starije životne dobi koji posjeduju rizik na pad ili zavisnost za pomoć pri kretanju smještenih u Domu za starija lica „Travnik“ u Travniku.

Uzorak ispitanika u istraživanju činilo je 40 osoba starije životne dobi ( $M=17$ ;  $\check{Z}=23$ ) smještenih u Domu za starija lica „Travnik“ u Travniku.

Kao istraživački instrument primijenjen je FEMBAF test koji je konstruisan kao alat za brzu procjenu mobilnosti, ravnoteže i straha od pada. Primijenjeni instrument konstruisan je kao test koji se sastoji od 18 zadataka koje su ispitanici trebali samostalno da izvrše. Svaki zadatak je ocjenjivan prema uspješnosti izvršenja ocjenom od 1 do 3.

Prije primjene FEMBAF testa primijenjen je upitnik sačinjen od 22 ajtema (pitanja) za utvrđivanje faktora rizika na koja su ispitanici usmeno odgovarali sa „da“ ili „ne“. Svaki potvrdni odgovor je sabiran i njihov zbir je smatran indeksom broja riziko faktora koji mogu uzrokovati pad.

Rezultati istraživanja su pokazali da je primjenom FEMBAF testa moguće pouzdano identifikovati osobe starije životne dobi koji posjeduju rizik na pad ili zavisnost za pomoć pri kretanju, a isto tako pruža format za uklanjanje faktora rizika koji su bili rizični prilikom izvođenja tretmana. Takođe, primjena upitnika za utvrđivanje faktora rizika koji mogu uzrokovati pad zajedno sa FEMBAF testom ukazuje na pouzdanost i opravdanost njegove primjene.

**Ključne riječi:** FEMBAF test, procjena, ravnoteža, pad, rizik, upitnik

## STUDY OF THE RELIABILITY OF THE APPLICATION OF THE FEMBAF TEST IN ELDERLY PERSONS

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### SUMMARY

The FEMBAF test (Fast evaluation of mobility, balance, and fear) is a comprehensive tool for identifying elderly people who are at risk of falling. It is used for a quick assessment of mobility, balance and fear of falling. In this regard, the main goal of the research was to identify elderly people who are at risk of falling or dependent on mobility aids housed in the Home for the Elderly "Travnik" in Travnik. The sample of respondents in the research consisted of 40 elderly people (M=17; F=23) housed in the Home for the Elderly "Travnik" in Travnik.

The FEMBAF test was used as a research instrument, which was designed as a tool for rapid assessment of mobility, balance and fear of falling. The applied instrument was constructed as a test consisting of 18 tasks that the respondents were supposed to perform independently. Each task was graded according to the success of its execution with a grade from 1 to 3.

Before applying the FEMBAF test, a questionnaire consisting of 22 items (questions) was used to determine risk factors, to which respondents answered verbally with "yes" or "no". Each affirmative answer was added up and their sum was considered as an index of the number of risk factors that could cause a fall.

The results of the research showed that by applying the FEMBAF test it is possible to reliably identify elderly people who have a risk of falling or dependence on a mobility aid, and also provides a format for removing risk factors that were at risk during the treatment. Also, the application of a questionnaire to determine risk factors that can cause a fall together with the FEMBAF test indicates the reliability and justification of its application.

**Key words:** FEMBAF test, assessment, balance, decline, risk, questionnaire.

## KOMPARATIVNA ANALIZA STRUKTURE NOGOMETA NA OSNOVU INDIKATORA SITUACIONE EFIKASNOSTI SVJETSKIH PRVENSTAVA 2010, 2014, 2018 GODINE

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### SAŽETAK

Cilj ovog istraživanja bio je utvrđivanje strukture nogometa kroz indikatore situacione efikasnosti na utakmicama svjetskih prvenstava. Uzorak istraživanja činilo je 370 nogometaša koji su odigrali svih 90 minuta utakmica osmine finala tri svjetska nogometna prvenstva SP2010 (N = 124), SP2014 (N = 126) i SP2018 (N = 120) godine. Korišteno je 30 varijabli situacione efikasnosti koje su preuzete sa oficijalne stranice Svjetske nogometne federacije ([www.fifa.com](http://www.fifa.com)). Za utvrđivanje strukture nogometa, korištena je faktorska analiza, metoda glavnih komponenata sa kosom direkt oblimin transformacijom, a za utvrđivanje značajnosti izlovanih faktora korišten je Kaiser-Gutmanovim kriterij. Analizom rezultata objašnjena zajedničke varijanse bila najveća na SP 2010 (83,52 %), zatim na SP 2014, (81,97 %), a najmanja objašnjena varijansa bilo je na SP 2018 godine (76,30 %). U strukturi nogometa na SP 2010 i SP 2014 izdvojilo se 6 latentnih faktora, a na SP 2018 izdvojila su se 4 latentna faktora, koji su različito zasićeni situacionim indikatorima. Zaključujemo da su se u vremenskom razdoblju od 8 godina desile promjene u strukturi nogometa, što nam pokazuje broj i struktura izlovanih faktora. Promijenila se struktura nogometa na način da se smanjio broj faktora sa 6 na 4, a struktura izolovanih faktora jasno definiše savremeni nogomet. Na osnovu rezultat mogu se jasno odrediti smjernice i standardi na kojima treba da se bazira nogometni trening, pri tom koristeći određena trenažna sredstva, trenažne stimuluse i odgovarajuća trenažna opterećenja kako bi se postigao visok nivo fizičke pripremljenosti, visok nivo tehnike u kretanju, visok ritam igre i taktička zrelost nogometaša.

**Ključne riječi:** vrhunski nogometaši, indikatori, situaciona efikasnost, Svjetsko prvenstvo

## COMPARATIVE ANALYSIS OF THE FOOTBALL STRUCTURE ON THE BASIS OF SITUATIONAL EFFICIENCY INDICATORS OF WORLD CHAMPIONSHIPS 2010, 2014, 2018

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### ABSTRACT

The aim of this research was to determine the structure of football through indicators of situational efficiency in world championship matches. The research sample consisted of 370 soccer players who played all 90 minutes of the Round of 16 matches of the three world soccer championships SP2010 (N = 124), SP2014 (N = 126) and SP2018 (N = 120). 30 variables of situational efficiency were used, which were taken from the official website of the World Football Federation ([www.fifa.com](http://www.fifa.com)). To determine the structure of football, we used factor analysis, the method of principal components with oblique direct oblimin transformation was used, and the Kaiser-Gutman criterion was used to determine the significance of the extracted factors. Analyzing the results, the explanation of the common variance was the highest at WC 2010 (83.52 %), followed by WC 2014 (81.97 %), and the lowest explained variance was at WC 2018 (76.30 %). In the structure of football at WC 2010 and WC 2014, 6 latent factors were singled out, and at WC 2018, 4 latent factors were singled out, which are differently saturated with situational indicators. We conclude that changes have occurred in the structure of football over a period of 8 years, which is shown by the number and structure of factors that have been fished out. The structure of football has changed in such a way that the number of factors has been reduced from 6 to 4, and the structure of isolated factors clearly defines modern football. Based on the results, the guidelines and standards on which football training should be based can be clearly determined, while using certain training tools, training stimuli and appropriate training loads in order to achieve a high level of physical preparation, a high level of technique in movement, a high rhythm of the game and tactical maturity of football players.

**Keywords:** top football players, indicators, situational efficiency, World Cup.

## UTICAJ OPŠTE MOTORIČKE SPREMNOSTI NA REZULTATE SKOKA U DALJ KOD DJEČAKA UZRASTA 11-14 GODINA

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### SAŽETAK

Jedan od najznačajnijih problemima kojima se bavi teorija atletike jeste markiranje dinamike razvoja rezultata pojedinih atletskih disciplina koja nastaje pod uticajem bioloških zakonitosti razvoja antropoloških karakteristika i sposobnosti, s jedne strane, i trenažnog procesa, s druge strane. Međutim veoma je značajno da se utvrde prediktorske vrijednosti nekih motoričkih sposobnosti od kojih u najvećoj mjeri ovisi ostvareni rezultat u nekim atletskim disciplinama.

U ovom radu će se razmatrati prevashodno rezultati skoka u dalj. Stoga je na populaciji učenika osnovnih škola u Tuzli koji su članovi atletske sekcije (N=53) primijenjeno je devet motoričkih testova kao prediktorski sistem varijabli, a kao kriterijska varijabla su bili rezultati skoka u dalj a sa ciljem da se utvrde veličine multiple i parcijalne korelacije prediktorskih motoričkih varijabli na rezultate skoka u dalj. Rezultati regresione analize potvrđuju i neka dosadašnja istraživanja, da ostvareni rezultat skoka u dalj uglavnom zavisi od eksplozivne snage nogu i brzine frekvencije pokreta.

**Ključne riječi:** skok u dalj, motoričke sposobnosti, regresiona analiza

## INFLUENCE OF GENERAL MOTOR ABILITY ON LONG JUMP RESULTS IN BOYS AGE 11-14

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### SUMMARY

One of the most important problems dealt with by the theory of athletics is the marking of the dynamics of the development of the results of individual athletic disciplines, which arises under the influence of the biological laws of the development of anthropological characteristics and abilities, on the one hand, and the training process, on the other. However, it is very important to determine the predictor values of some motor abilities, on which the achieved result in some athletic disciplines depends to the greatest extent. In this paper, the results of the long jump will be considered. Therefore, on the population of elementary school students in Tuzla who are members of the athletic section (53 respondents), nine motor tests were applied as a predictor system of variables, and the long jump results were the criterion variable with the aim of determining the magnitudes of multiple and partial correlations of the predictors. of motor variables on long jump results. The results of the regression analysis confirm some previous research, that the long jump result mainly depends on the explosive power of the legs and the speed of the movement frequency.

**Key words:** long jump, motor skills, regression analysis

## ANALIZA RAZLIKA U MORFOLOŠKIM KARAKTERISTIKAMA I POSTURALNOM STATUSU STOPALA UČENIKA PRVOG RAZREDA OSNOVNE ŠKOLE

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### SAŽETAK

Istraživanje je provedeno na uzorku od 80 učenika i 86 učenica prvog razreda osnovne škole s ciljem utvrđivanje razlika u dimenzionalnosti morfoloških karakteristika i prisutnosti deformiteta stopala učenika i učenica prvog razreda osnovne škole. U istraživanju je primjenjen set od dvanaest (12) varijabli morfoloških karakteristika i set od osam (8) varijable za procjenu posturalnog statusa stopala. U cilju utvrđivanja razlika morfoloških karakteristika i posturalnog statusa stopala kod učenika i učenica prvog razreda osnovne škole primijenjena je multivarijantna i univarijantna analiza varijanse (MANOVA i ANOVA).

Multivarijantnom i univarijantnom analizom varijanse (MANOVA i ANOVA) utvrđene su statistički značajne razlike među ispitivanim grupama učenika i učenica u istraživanim varijablama, kao i doprinos istraživanih varijabli razlikovanju ispitivanih grupa. Pokazalo se da dječaci imaju izraženije longitudinalne i transverzalne dimenzionalnosti, a djevojčice veću voluminoznost i veći procenat potkožnog masnog tkiva što je u skladu sa biološkim zakonitostima razvoja djeteta ovog uzrasnog perioda. Primjenom kontigencijskih tablica prikazane su frekvencije i pripadajući postoci pojave deformiteta stopala. Primjenom Hi-kvadrat testa utvrđena je zastupljenost i statistička značajnost razlika deformiteta stopala između spolova (učenici i učenice).

Dobijeni rezultati istraživanja ukazuju na relativno veći procenat deformiteta uzdužnog i poprečnog svoda stopala s tim da učenici imaju češće ravno stopalo u odnosu na učenice. Promjene na svodovima stopala su uglavnom u prvom i drugom stepenu, što omogućava popravljavanje stanja uz primjenu korektivnih vježbi u radu sa djecom ovog uzrasta.

**Ključne riječi:** analiza varijanse, Hi kvadrat test, razlike, morfološke karakteristike, posturalni status stopala, učenici, učenice



## ANALYSIS OF DIFFERENCES IN THE MORPHOLOGICAL CHARACTERISTICS AND POSTURAL STATUS OF FEET OF FIRST GRADE PRIMARY SCHOOL STUDENTS

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### ABSTRACT

The research was conducted on a sample of 80 male and 86 female students of the first grade of elementary school with the aim of determining the differences in the dimensionality of morphological characteristics and the presence of foot deformities among male and female students of the first grade of elementary school. In this research we applied a set of twelve (12) variables of morphological characteristics and a set of eight (8) variables for assessing the postural status of the feet. Multivariate and univariate analysis of variance (MANOVA and ANOVA) was applied in order to determine the differences in morphological characteristics and postural status of the feet in male and female students of the first grade of elementary school. Multivariate and univariate analysis of variance (MANOVA and ANOVA) revealed statistically significant differences between the investigated groups of male and female students in the investigated variables, as well as the contribution of the investigated variables to distinguishing the investigated groups. Research has shown that boys have more pronounced longitudinal and transverse dimensions, and girls have greater voluminousness and a higher percentage of subcutaneous fat tissue, which is in accordance with the biological laws of child development of this age period. Using contingency tables, the frequencies and associated percentages of the occurrence of foot deformities are shown. Using the Chi-square test, the prevalence and statistical significance of differences in foot deformities between the sexes (boys and girls) was determined. The obtained research results indicate a relatively higher percentage of deformities of the longitudinal and transverse arch of the foot, with the fact that male students have flat feet more often than female students. Changes in the arches of the feet are mostly in the first and second degree, which makes it possible to repair the condition with the application of corrective exercises when working with children of this age.

**Key words:** analysis of variance, Chi square test, differences, morphological characteristics, postural status of feet, male and female students.

## EFFECTS OF ORGANIZED SCHOOL-BASED PHYSICAL ACTIVITY ON MOTOR COORDINATION OF 7-11 YEARS OLD CHILDREN

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### ABSTRACT

Decreased physical activity is a problem that affects negatively physical status and motor coordination of children all over the world. Countries often recognize this trend and use organized physical activity at the level of municipalities to address this problem. The purpose of this study was to evaluate how organized physical activity influenced motor coordination in lower grades children.

1070 pupils of Sabac town municipality primary schools aged from 6 to 10 years took part in this study and were divided in five age groups (one: 6-7 years; two: 7-8 years; three: 8-9 years; four: 9-10 years; five: 10-11 years). The first three groups had classes based on gymnastics exercises, while other two groups used collective sports classes. Lateral side jumps of 15 sec were used to assess general motor coordination. Initial testing was at the beginning of school year, while final testing was at the end of school year. Two-way ANOVA (testing x age group) was used to observe the differences.

In all age groups were observed differences between initial and final testing (one:  $F_{1,133}=20.87$ ,  $p=0.000$ ,  $ES=0.14$ ; two:  $F_{1,133}=21.58$ ,  $p=0.000$ ,  $ES=0.14$ ; three:  $F_{1,133}=12.15$ ,  $p=0.001$ ,  $ES=0.08$ ; four:  $F_{1,133}=13.57$ ,  $p=0.000$ ,  $ES=0.09$ ; five:  $F_{1,133}=4.08$ ,  $p=0.04$ ,  $ES=0.03$ ). In first two groups, pupils increased number of jumps for 16%, in third for 13%, in fourth for 9% and in fifth for 8%.

Greater motor coordination improvement was observed in children, who used gymnastics based classes rather than collective sports based classes. It is therefore, recommended to use basic gymnastics exercise for developing of motor coordination.

*Key words:* KTK test; lateral side jumps

## NEDOSTACI U MOTORIČKOM RAZVOJU PREDŠKOLSKE DECE DEFICIENCIES IN THE MOTOR DEVELOPMENT OF PRESCHOOL CHILDREN

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### ABSTRAKT

Ovaj rad treba da pomogne vaspitačima da se upoznaju sa najčešćim nedostacima, poremećajima, koji se, između ostalog, odražavaju na razvoj motoričkih sposobnosti dece i činjenicom da nedostaci najčešće nastaju i mogu se primetiti upravo u predškolskom dobu. Kako živimo u „eri“ inkluzivnog obrazovanja, autori su imali potrebu da vaspitačima pomognu u prepoznavanju mogućih znakova eventualnog motoričkog poremećaja kod dece. Tako iz toga proizilaze problem, predmet i cilj ovog rada. Problem ovog rada se bazirao na tome – kako utvrditi i opisati nedostatke u motoričkom ponašanju dece predškolskog uzrasta. Predmet ovog rada predstavljaju deca predškolskog uzrasta, te sakupljeni radovi, koji ukazuju na motorički razvoj i eventualnu motoričku insuficijenciju, dok se cilj ovog rada odnosio na definisanje najznačajnijih i prisutnijih oblika motoričke insuficijencije i davanje jasnih smernica u rešavanju i dodatnom radu na polju fizičkog vaspitanja dece, koja imaju neki oblik motoričkog nedostatka. U radu je primenjena deskriptivna metoda rada, te je tako opisano 5 najčešćih poremećaja, nedostataka u motoričkom razvoju predškolske dece, a to su: Dečija paraliza, cerebralna paraliza, minimalna neurološka disfunkcija, autizam, ADHD (hiperaktivnost). Nikako se ne sme „ispuštati iz vida“ značaj realizacije aktivnosti iz fizičkog vaspitanja u radu sa svom decom, a naročito sa decom koja imaju neki od oblika motoričke insuficijencije.

**Ključne reči:** motorička insuficijencija (nesposobnost), motoričko ponašanje dece, fizičko vaspitanje, inkluzija.

## DEFICIENCIES IN THE MOTOR DEVELOPMENT OF PRESCHOOL CHILDREN

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### ABSTRACT

This work should help educators to become familiar with the most common deficiencies, disorders, which, among other things, affect the development of children's motor skills and the fact that deficiencies most often arise and can be noticed precisely in preschool age. As we live in the "era" of inclusive education, the authors had a need to help educators recognize possible signs of possible motor disorders in children. Thus, the problem, the subject and the goal of this paper arise from that. The problem of this paper was based on that - how to determine and describe deficiencies in the motor behavior of preschool children. The subject of this work is pre-school children, and the collected works, which indicate motor development and possible motor insufficiency, while the goal of this work was to define the most significant and present forms of motor insufficiency and to provide clear guidelines for solving and additional work in the field of physical education of children, who have some form of motor deficiency. The paper uses a descriptive method of work, and thus describes the 5 most common disorders and deficiencies in the motor development of preschool children, namely: polio, cerebral palsy, minimal neurological dysfunction, autism, ADHD (hyperactivity). The importance of implementing physical education activities in working with all children, and especially with children who have some form of motor insufficiency, must not be "lost from sight".

**Keywords:** motor insufficiency (inability), motor behavior of children, physical education, inclusion.

## PROCJENA KVALITETA USLUGA U FUBALSKOM KLUBU NA OSNOVU KORISNIČKE PERCEPCIJE

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### SAŽETAK

Istraživanje je realizovano sa ciljem procjene kvaliteta sportske usluge u fudbalskom klubu na osnovu mišljenja aktivnih članova kluba (njihovih roditelja). Uzorak ispitanika je činilo 107 roditelja djece Fudbalskog kluba "Sloboda" iz Novog Grada, BiH (86 muškog i 21 ženskog pola). Anketiranje je izvršeno putem online upitnika i skale sociološkog tipa, u periodu septembar-oktobar 2020. Ispitanici su pri anketiranju mogli dati jedan od ponuđenih odgovora: u potpunosti se slažem, slažem se, niti se slažem niti se ne slažem, ne slažem se, u potpunosti se ne slažem. Na osnovu izvršenog kvantifikovanja rezultata i kategorizacije ispitanika prema frekvencijama odgovarajućih varijabli, može se zaključiti da članovi-polaznici škole fudbala imaju pozitivan stav prema varijablama koje procjenjuju kvalitet usluga u fudbalskom klubu. Dobijeni rezultati mogu biti od koristi u budućim istraživanjima u procjeni kvaliteta sportskih usluga od strane korisnika i praktičnu primjenu mogu imati u poboljšanju pružanja sportskih usluga u klubu. Ključne riječi: kvalitet, sportska usluga, fudbal, korisnici.

## ASSESSMENT OF THE QUALITY OF SERVICES IN A FOOTBALL CLUB BASED ON USER PERCEPTION

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Education, Novi Sad, Serbia

### SUMMARY

The research was conducted with the aim of assessing the quality of sports services in a football club based on the opinion of active members of the club (their parents). The sample of respondents consisted of 107 parents of children from the Football club "Sloboda" from Novi Grad, Bosnia and Herzegovina (86 male and 21 female). The survey was conducted through an online questionnaire and a sociological-type scale, in the period September-October 2020. During the survey, the respondents could give one of the following answers: I completely agree, I agree, either I do agree nor I do disagree, I do not agree, in I completely disagree. Based on the quantification of the results and the categorization of respondents according to the frequencies of the corresponding variables, it can be concluded that the members-students of the football school have a positive attitude towards the variables that evaluate the quality of services in the football club. The obtained results can be useful in future research in the assessment of the quality of sports services by users and can have a practical application in improving the provision of sports services in the club.

**Keywords:** quality, sports service, football, users.

## TENZIOMIJOGRAFSKA MJERENJA NATJECATELJA U SPUSTU I SLALOMU U ALPSKOM SKIJANJU

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### SAŽETAK

Sa razvojem skijaških disciplina profesionalno alpsko skijanje dostiglo je stepen, gde je veoma teško dostići vrhunске rezultate. U procesu obuke sve je više posebnih elemenata koji su efikasniji za svaku disciplinu. Cilj ovog rada bio je da se utvrdi da li postoje razlike u kontraktilnim karakteristikama vastus lateralis (VL) i vastus medialis (VM) među alpskim skijašima brzih i tehničkih disciplina. U cijelo istraživanje je bilo uključeno 14 osoba. Prosječna starost je bila 26,9 godina ( $\pm 2,8$  godina), prosječna visina 190,2 cm ( $\pm 4,7$  cm), prosječna težina 87,4 kg ( $\pm 6,9$  kg). U istraživanje su uključeni svi profesionalni skijaši, takmičari u Svjetskom kupu. Mjere su vršene tenziomiografijom. Promatrali smo mehanički odgovor mišića na svaki električni stimulans. Otkrili smo da skijaši u tehničkim disciplinama imaju kraće vrijeme držanja VM mišića obje noge i veću amplitudu VL mišićnog odgovora desne noge. Prema rezultatima VL mišića saznali smo da skijaši u tehničkim disciplinama imaju kraće vrijeme kontrakcije i držanja obje noge, ali je kraće vrijeme opuštanja samo na desnoj nozi i veća amplituda odziva samo na lijevoj nozi. Rezultati istraživanja su pokazali da u disciplinama alpskog skijanja postoje razlike u kontraktilnim karakteristikama najvažnijih musculus quadriceps femoris. Navedene razlike mogu biti rezultat biomehaničkih razlika u tehnici skijanja.

**Ključne riječi:** alpsko skijanje, skeletni mišići, tenziomiografija, kontraktilne karakteristike, trzanje

## TENSIOMYOGRAPHY MEASUREMENTS OF DOWNHILL AND SLALOM COMPETITORS IN ALPINE SKIING

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### ABSTRACT

With the development of skiing disciplines professional alpine skiing has reached the degree, where top results is very hard to reach. In the process of training there are more and more special elements that are more effective for each discipline. The purpose of diploma work was to find out whether there are differences in contractile characteristics in vastus lateralis (VL) and vastus medialis (VM) among alpine skiers of fast and technical disciplines. There were 14 people included in the whole research. The average age was 26,9 years ( $\pm 2,8$  years), the average height was 190,2 cm ( $\pm 4,7$  cm), the average weight was 87,4 kg ( $\pm 6,9$  kg). People included in the research were all the professional skiers, competitors in the world cup. Measures were made by tensiomyography. We were observing the mechanical response of muscle onto each electrical stimulant. We found out that skiers in technical disciplines have shorter time of holding VM muscle of both legs and the higher amplitude of VL muscle response of the right leg. According to the results of the VL muscle we found out the skiers in technical disciplines have shorter time of contracting and holding of both legs, but there is shorter time of relaxing just on the right leg and a higher responding amplitude just on the left leg. The results of research showed that there are differences in alpine skiing disciplines in contractile characteristics of most important musculus quadriceps femoris. The differences that were mentioned can be the result of biomechanical differences in skiing technique.

**Keywords:** alpine skiing, skeletal muscle, tensiomyography, contractile characteristics, twitch

## MODERN APPROACHES TO PLANNING AND PASSING EDUCATIONAL MATERIAL ON THE SUBJECT "PHYSICAL EDUCATION" IN EDUCATIONAL INSTITUTIONS OF THE REPUBLIC OF KAZAKHSTAN

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### ANNOTATION

The article provides a description and characteristics of the curriculum on the subject "Physical Education" in educational institutions. The events of recent years in political and economic terms have led to a change in the way of life of Kazakhstani society, including in the system of physical education. In accordance with modern requirements, in educational institutions were created a new system, goals and objectives of physical education. The system of education and upbringing of each generation changed. Methods, principles, types of physical exercises, ways of organizing motor activity began to be revised. Physical education as a social phenomenon has forever remained in a people's life. Changes in the goals and objectives of the system of physical education also affected the specific methods of physical education - physical exercises. Combining the moral methods of the former Soviet Union society and the younger generation through the traditional ethno-pedagogical education of the Kazakh people, it makes a significant contribution to the education of truly patriotic youth. Physiological characteristics, mental, physical development, motor fitness and compliance with hygiene standards with providing a differentiated and individual approach to students and taking into account the state of health are the main requirement for conducting a modern lesson in physical culture. The well-being of society improves and develops with each mentioned stage and due to this the necessary is to increase the physical qualities and exercises for a human. New tasks give rise to new systems of motor qualities. The subject of teaching physical culture in high school is the motor activity of students with a general developmental focus.

**Key words:** physical culture, educational institutions, curricula, educational process.

## UTJECAJ BOLESTI COVID-19 NA RAVNOTEŽU

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### SAŽETAK

Koronavirus trenutno predstavlja jedan od vodećih javno zdravstvenih problema u svijetu. Protekom vremena utvrđeno je da je to multisistemska bolest koja zahvaća širok spektar organa i organskih sustava. Cilj ovog rada je ispitati utjecaj bolesti COVID-19 na kapacitete ravnoteže. Ispitanici su osobe prosječne starosne dobi  $39,75 \pm 14,22$  godina. Za procjenu rezultata ravnoteže korišten je Test stajanja na jednoj nozi, otvorenim i zatvorenim očima. Rezultati ukazuju da ne postoji statistički značajna razlika na promatranim testovima između ispitanika neovisno o spolu i dobi te preboljenju COVID-19. Obzirom na posljedice sindroma koronavirusa te važnost ravnoteže u svakodnevnom životu, potrebna su daljnja ekstenzivna istraživanja na ovu temu.

**Ključne riječi:** COVID-19, testiranje, ravnoteža

## INFLUENCE OF THE DISEASE COVID-19 ON THE BALANCE

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### ABSTRACT

The coronavirus is currently one of the leading public health problems in the world. Over time, it has been established that it is a multisystemic disease that affects a wide range of organs and organ systems. The aim of this study is to examine the influence of the disease COVID-19 on balance capacities. The respondents were persons with an average age of  $39.75 \pm 14.22$  years. To evaluate the balance results, the Test of standing on one leg, with eyes open and eyes closed, was used. The results indicate that there is no statistically significant difference in the observed tests between the subjects regardless of gender and age, and recovery from COVID-19. Considering the consequences of the coronavirus syndrome and the importance of balance in everyday life, further extensive research on this topic is needed.

**Keywords:** COVID-19, testings, balance

## INJURIES AND RISK FACTORS AMONG C-CLASS DANCESPORT ATHLETES

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### ABSTRACT

Dancesport is a dexterity activity with considerable muscle engagement. Competitions and dance training involve high physiological and psychological stress, which can lead to risk of injury, forcing the athlete to take a break to recover. There were a variety of risk factors related to dancesport injuries including lack of warm-up, cool-down, overtraining, poor dance technique, environmental factors, and muscle imbalances. Few studies investigate the situation regarding the incidence of injuries and related risk factors following recovery from the COVID-19 pandemic in non-elite athletes. The aim of this study was twofold: to record athletes' injury incidence over the last year, following recovery from the COVID-19 pandemic, and to investigate their perceptions toward possible related risk factors. The present study was designed to describe the characteristics of 30 C-class dancesport athletes ( $17 \pm 1.2$  years old). An ad-hoc questionnaire, composed of 12 questions, was prepared with Google Form and administered via e-mail. Descriptive statistics was used to summarize data while Chi Square to identify the associations between participant responses. About 60% of the athletes were injured in the last year: 50% in the femoral area, 61% suffered a strain, and 88% were injured during training. Several wrong habits were identified, including lack of cool-down, loss of concentration, and poor technique. Therefore, statistically significant relationship emerged ( $p < 0.05$ ) that can help coaches and athletes prevent injuries. There is a need to intervene with prevention programs and increased awareness of proper behaviors to prevent injuries.

**Keywords:** prevention, habits, training, incidence, kinesiologist, dancers