

# Book of Summaries



**11 MEĐUNARODNA  
KONFERENCIJA  
"SPORTSKE NAUKE I  
ZDRAVLJE"**  
*11<sup>th</sup> INTERNATIONAL  
CONFERENCE ON "SPORTS  
SCIENCE AND HEALTH"*

suorganizatori:



KAZAKH NATIONAL PEDAGOGICAL  
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FAKULTET ZA SPORT I TURIZAM

„Idem tamo gde je lepota... i gde je tesko.“  
Clark Little

**JA SAM DRUGACJI**

**Nikon**



11 MEĐUNARODNA  
KONFERENCIJA "SPORTSKE  
NAUKE I ZDRAVLJE"  
11<sup>th</sup> INTERNATIONAL  
CONFERENCE ON "SPORTS  
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## ANALIZA RAZLIKA TRKAČKIH PERFORMANSI VRHUNSKIH EVROPSKIH I LATINOAMERIČKIH NOGOMETAŠA

Adnan Ademović, Adi Palić, Ekrem  
Čolakhodžić, Almir Popo

*Nastavnički fakultet „Univerzitet“ Džemal Bijedić“ u  
Mostaru*

## ANALYSIS OF DIFFERENCES OF RUNNING PERFORMANCES OF ELITE EUROPEAN AND LATIN AMERICAN FOOTBALL PLAYERS

Adnan Ademović, Adi Palić, Ekrem  
Čolakhodžić, Almir Popo

*Teacher Training faculty, Džemal Bijedić University of  
Mostar*

### SAŽETAK

Ovo istraživanje imalo je za cilj da se utvrde razlike u trkačkim performansama vrhunskih evropskih i latinoameričkih nogometaša. Istraživanje je sprovedeno na uzorku od  $N=157$  vrhunskih nogometaša, uzrasta 19 do 35 godina koji su odigrali svih 90 minut u I kolu grupne faze takmičenja na Svjetskom nogometnom prvenstvu 2018 godine. Ispitanici su svrstani u dvije grupe, gdje su I grupu ( $N=103$ ), činile nogometne reprezentacije iz Evrope, a II grupu ( $N=57$ ), činile su reprezentacije iz Latinske Amerike. Dobijeni podaci nam pokazuju da 8 od ukupno 13 varijabli ima karakteristiku heterogenosti sa većom vrijednošću varijance od aritmetičke sredine. Rezultati T-testa su pokazali da je samo kod 4 od 13 varijabli došlo do statistički značajnih razlika. Nogometaši iz evropskih reprezentacija u prosjeku su viši od latinoameričkih nogometaša za nešto više od 3 cm. Evropski nogometaši su imali 4 % veću ( $p>0,05$ ) ukupnu pređenu udaljenosti, udaljenost u prvom i drugom poluvremenu od latinoameričkih nogometaša.

**Ključne riječi:** nogomet, performanse, Svjetsko prvenstvo.

### ABSTRACT

This research is aimed to determine the differences in the racing performances of elite European and Latin American footballers. The research was conducted on a sample of  $N = 157$  top football players, aged 19 to 35, who played all 90 minutes in the first round of the group stage of the competition at the 2018 World Cup. Respondents were classified into two groups, where group I ( $N = 103$ ) consisted of football teams from Europe, and group II ( $N = 57$ ), consisted of teams from Latin America. The obtained data showed that 8 out of 13 variables have the characteristic of heterogeneity with a higher value of variance than the arithmetic mean. The results of the T-test showed that only 4 of 13 variables had statistically significant differences. Footballers from European national teams are on average taller than Latin American footballers by just over 3 cm. European footballers had a 4% greater ( $p>0.05$ ) total distance traveled, distance in the first and second half of the game than Latin American footballers.

**Keywords:** Football, performance, World Cup.

## EFEKTI VJEŽBI AKROBATIKE NA EKSPLOZIVNU SNAGU I FLEKSIBILNOST KOD ŠKOLSKE DJECE UZRASTA 14 GODINA

Nikola Ilić<sup>1,2</sup>, Anka Šmitran-Đurić<sup>1</sup>, Predrag Kragulj<sup>1</sup>, Željko Sekulić<sup>3</sup>

<sup>1</sup>Zavod za medicinu rada i sporta Republike Srpske

<sup>2</sup>Panevropski univerzitet Apeiron

<sup>3</sup>Univerzitet u Banjoj Luci, Fakultet fizičkog vaspitanja i sporta

### SAŽETAK

Uzorak ispitanika činilo je 60 učenika osnovnih škola, uzrasta 13 i 14 godina,  $\pm$  6 mjeseci, u Istočnom Sarajevu. Uzorak je bio podijeljen u dvije grupe. Prva grupa, imala je 30 ispitanika, i činili su je učenici osnovnih škola u Istočnom Sarajevu, obuhvaćeni redovnom nastavom fizičkog vaspitanja i dodatnim trenažnim radom akrobatike sa tri časa nedjeljno (eksperimentalna grupa). Drugu grupu je činilo 30 ispitanika, učenika osnovnih škola u Istočnom Sarajevu, obuhvaćeni redovnom nastavom fizičkog vaspitanja (kontrolna grupa). Osnovni cilj je bio da se utvrde promjene motoričkih sposobnosti (eksplozivne snage i fleksibilnosti) eksperimentalne grupe obuhvaćene redovnom nastavom fizičkog vaspitanja i eksperimentalnim programom modela motoričkih vježbi akrobatike u eksperimentalnom periodu (8 nedjelja). Dodatni cilj je bio da se utvrde promjene motoričkih sposobnosti (eksplozivne snage i fleksibilnosti) kontrolne grupe obuhvaćene redovnom nastavom fizičkog vaspitanja u eksperimentalnom periodu (8 nedjelja). Poseban cilj je se odnosio na efekat vježbi akrobatike na motoričke sposobnosti (eksplozivnu snagu i fleksibilnost) u finalnom mjerenju, između eksperimentalne i kontrolne grupe. Rezultati istraživanja su pokazali da je došlo da statistički značajnog poboljšanja nivoa eksplozivne snage i fleksibilnosti samo kod eksperimentalne grupe, dok kod kontrolne grupe nije bilo poboljšanja. Mjerne instrumente je činilo četiri motorička testa.

**Ključne riječi:** vježbe akrobatike, eksplozivna snaga i fleksibilnost

## EFFECTS OF ACROBATICS EXERCISES ON EXPLOSIVE STRENGTH AND FLEXIBILITY OF 14 YEARS OLD SCHOOL CHILDREN

### SUMMARY

The sample consisted of 60 elementary school students, aged 13 and 14 years,  $\pm$  6 months, in East Sarajevo. The sample was divided into two groups. The first group, with 30 subjects, consisted of elementary school students in East Sarajevo, enrolled by regular physical education classes and additional acrobatics training with three lessons per week (experimental group). The second group consisted of 30 respondents, elementary school students in East Sarajevo, enrolled in regular physical education classes (control group). The main objective was to identify changes in motor abilities (explosive power and flexibility) of the experimental group enrolled by regular physical education classes and an experimental program of model acrobatics motor exercises in the experimental period (8 weeks). An additional objective was to identify changes in motor abilities (explosive power and flexibility) of the control group included in the regular physical education classes during the experimental period (8 weeks). A specific objective was related to the effect of acrobatics exercises on motor abilities (explosive power and flexibility) in the final measurement, between the experimental and control groups. The results of the study showed that there was statistically significant improvement in the level of explosive power and flexibility in the experimental group only, while in the control group there was no improvement. Measuring instruments consisted of four motor tests.

**Keywords:** acrobatics exercises, explosive power and flexibility

## MOTIVACIJA ZA REKREATIVNO VJEŽBANJE U ODNOSU NA SPOLNE I DOBNE RAZLIKE

Damir Đedović, Rijad Novaković, Ekrem  
Čolakhodžić, Almir Popo

*Nastavnički fakultet, Univerzitet "Džemal Bijedić" u  
Mostaru*

### APSTRAKT

Cilj ovog istraživanja je identificirati motivacijsku strukturu rekreativnih vježbača i istražiti razlike u motivaciji s obzirom na spol, tj. utvrditi hijerarhiju motiva zbog kojih oni biraju rekreativno vježbanje. Ovo istraživanje pokazuje da je najsnažnija motivacija za rekreativno vježbanje održavanje i poboljšanje zdravlja, te svakako opuštanje i relaksacija. Posle njih, najvažnija motivacija jeste druženje i upoznavanje novih ljudi, i unapređenje i održavanje tjelesne sposobnosti. Sprovedeno istraživanje je pokazalo i to da postoje vrlo male razlike u motivima za vježbanje u odnosu na dob ispitanika, a one se ogledaju u dobrom izgledu i zabavi, dok je opuštanje i relaksacija i unapređenje i održavanje tjelesne sposobnosti jednako važno svim životnim dobima ispitanika.

**Ključne riječi:** Rekreativno vježbanje, motivacija, spolne i dobne razlike

## MOTIVATION FOR RECREATIONAL EXERCISE IN RELATION TO GENDER AND AGE DIFFERENCES

Damir Đedović, Rijad Novaković, Ekrem  
Čolakhodžić, Almir Popo

*Faculty of Education, University "Džemal Bijedić" in  
Mostar*

### ABSTRACT

The aim of this research is to identify the motivational structure of recreational exercisers and to investigate differences in motivation with respect to gender, ie to determine the hierarchy of motives for which they choose recreational exercise. This research shows that the strongest motivation for recreational exercise is maintaining and improving health, and certainly relaxation. After them, the most important motivation is socializing and meeting new people, and improving and maintaining physical ability. The research also showed that there are very small differences in the motives for exercise in relation to the age of the respondents, and they are reflected in good looks and fun, while relaxation and relaxation and improvement and maintenance of physical ability are equally important for all ages.

**Keywords:** Recreational exercise, motivation, gender and age differences

## RELACIJA KARAKTERISTIKA RUKOMETNIH SPORTSKIH MENADŽERA VIŠIH RAZINA I IZVORA FINANSIRANJA RUKOMETNIH KLUBOVA

Stjepan Skoko<sup>1</sup>, Damir Đedović<sup>2</sup>, Martina Planinić<sup>3</sup>

<sup>1</sup>Srednja strukovna škola "Široki Brijeg" iz Širokog Brijega,

<sup>2</sup>Nastavnički fakultet, Univerzitet "Džemal Bijedić" u Mostaru,

<sup>3</sup>Fakultet prirodoslovno-matematičkih i odgojnih znanosti, Sveučilište u Mostaru

### SAŽETAK

Cilj ovog istraživanja bio je utvrditi odnos između većeg broja karakteristika rukometnih sportskih menadžera viših razina i izvora finansiranja rukometnih klubova. Za potrebe ovog istraživanja anketirano je 48 menadžera sve tri upravljačke razine; top menadžeri, funkcionalni menadžeri i operativni menadžeri, koji su dio upravljačkih struktura ženskih rukometnih klubova, koji se takmiče u ženskoj Premijer ligi Bosne i Hercegovine. Ponuđena im je anonimna anketa s 35 pitanja, od čega se 30 varijabli odnosilo na opće karakteristike menadžera, a 5 varijabli se odnosilo na izvore finansiranja. Rezultati istraživanja su pokazali da finansiranje i opstanak rukometnih klubova uveliko zavisi od karakteristika rukometnih sportskih menadžera, prvenstveno od njihovog iskustva u tom poslu. Također, rezultati istraživanja kažu da je veoma bitno njihovo obrazovanje, kako ono formalno koje stiču prilikom studiranja, tako i neformalno koje stiču organiziranjem i učestvovanjem u raznim seminarima. **Ključne riječi:** Sportski menadžeri, rukometni klubovi, predviđanje, upravljanje, obrazovanje

## RELATIONSHIP OF CHARACTERISTICS OF HIGH-LEVEL HANDBALL SPORTS MANAGERS AND SOURCES OF FINANCING OF HANDBALL CLUBS

Stjepan Skoko<sup>1</sup>, Damir Đedović<sup>2</sup>, Martina Planinić<sup>3</sup>

<sup>1</sup>Secondary vocational school "Široki Brijeg" from Široki Brijeg,

<sup>2</sup>Faculty of Education, University "Džemal Bijedić" in Mostar,

<sup>3</sup>The Faculty of science and education at the University of Mostar

### ABSTRACT

The aim of this research was to determine the relationship between a number of characteristics of higher level handball sports managers and sources of funding for handball clubs. For the purposes of this research, 48 managers from all three management levels were surveyed; top managers, functional managers and operational managers, who are part of the management structures of women's handball clubs, which compete in the women's Premier League of Bosnia and Herzegovina. They were offered an anonymous survey with 35 questions, of which 30 variables related to general characteristics of managers, and 5 variables related to funding sources. The results of the research showed that the financing and survival of handball clubs largely depends on the characteristics of handball sports managers, primarily on their experience in this business. Also, the research results say that their education is very important they acquire by organizing and participating in various seminars. **Keywords:** Sports managers, handball clubs, forecasting, management, education

## KORELACIONI ASPEKTI STRATEGIJSKIH OPREDJELJENJA INTERNOG MARKETINGA PREDUZEĆA U OBLASTI PRIMARNE ZDRAVSTVENE ZAŠTITE

**Vanja Sredojević, Mirjana Landika, Branislav Mihajlović**

*Panevropski Univerzitet "Apeiron" Banja Luka, BiH*

### SAŽETAK

Poslovna efikasnost uslužnih preduzeća zasniva se na prepoznavanju i uvažavanju korisničkih zahtjeva i očekivanja, kao i preispitivanja korisničke percepcije koncepta ponuđene i pružene usluge i u oblasti primarne zdravstvene zaštite. Korisnička očekivanja u navedenoj oblasti odnose se ne samo na direktne korisnike, već tangira i veliki broj lica koji su u rodbinskoj i/ili emotivnoj vezi sa korisnicima. Usluge iz posmatranog domena determinišu kvalitet života gotovo svih članova društvene zajednice. Verifikovanje korisničke percepcije kvaliteta usluge u okviru primarne zdravstvene zaštite, omogućava usaglašavanje radnog kodeksa sa korisničkim zahtjevima i očekivanjima. Ispitivanje stepena i smjera kvantitativnog slaganja varijacija posmatranih pojava omogućava korekciju postupaka i dodatne edukacije zaposlenih, čime se postiže prilagođavanje sistema primarne zdravstvene zaštite sa korisničkim očekivanjima i zahtjevima. Pristup istraživanju zasnovan na empirijskom ispitivanju stavova ispitanika, za cilj ima da se formulišu adekvatne strategije internog marketinga na zadacima usaglašavanja sistemskih rješenja zasnovanih na korelacionoj analizi. Modelirana upravljačka rješenja imaju potencijal naučnog odgovora realnom problemu i olakšavanju nosiocima sistema primarne zdravstvene zaštite smanjenju jaza između korisničkih očekivanja i kvaliteta realizovane usluge. Navedeno se efikasno postiže razumijevanjem i uvažavanjem realnih faktora u pogledu usklađenog pristupa korisnicima, proizašlim iz korelacione analize korisničkih zapažanja i očekivanja. **Ključne riječi:** korisnička očekivanja, korelaciona analiza, strategije internog marketinga, sistem primarne zdravstvene zaštite

## CORRELATION ASPECTS OF STRATEGIC ORIENTATIONS OF INTERNAL MARKETING OF ENTERPRISES IN PRIMARY HEALTH CARE

**Vanja Sredojević, Mirjana Landika, Branislav Mihajlović**

*Pan-European University "Apeiron", Banja Luka, Bosnia and Herzegovina*

### ABSTRACT

The business efficiency of a service company is based on recognition and appreciation of customer requirements and expectations, as well as reviewing of the customer perception of the concept of service offered and provided in the field of primary health care. Customer expectations in mentioned field regard not only to direct users but also it affects the large number of individuals who are in family and/or emotional relationship with the users. Services from observed domain determine the quality of life of almost all member of the community. Verification of customer perceptions of service quality in primary health care gives opportunity for harmonization of the working code with customer requests and expectations. Examining the degree and direction of quantitative agreement of variations of observed phenomena enables the correction of procedures and additional education of employees, which achieves the adaptation of the primary health care system with customer expectations and requirements. A research approach based on the empirical examination of respondents attitudes, aims to formulate adequate internal marketing strategies on the task of aligning system solutions based on correlation analysis. Modeled managements solutions have the potential of scientific answer to real problem and to facilitate primary care system providers to reduce the gap between customer expectations and the quality of service delivered. The above is effectively achieved by understanding and appreciating the real factors regarding a coordinated approach to users, resulting from a correlative analysis of user observations and expectations.

**Keywords:** customer expectations, correlation analysis, internal marketing strategies, primary care system

## PHYSICAL EDUCATION THROUGH PLAY IN PRESCHOOL CHILDREN

Zorica Stankovska<sup>1</sup>, Lirona Hoxha Hasani<sup>2</sup>, Zharko Kostovski<sup>3</sup>

<sup>1</sup>University Ss. Cyril and Methodius - Skopje, Faculty of Pedagogy St. Kliment Obridski,

<sup>2</sup>University Ss. Cyril and Methodius - Skopje, Faculty of Physical Education, Sport and Health, School for Doctoral Studies

<sup>3</sup>University Ss. Cyril and Methodius - Skopje, Faculty of Physical Education, Sport and Health,

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### ABSTRACT

In preschool, the foundations are laid for the health, physical fitness and harmonious physical development of children. The main feature of physical education of preschool children is the form of the play of physical education. Movement plays are an inexhaustible source of joy, experience and knowledge, because they correspond to the nature of the child. Through play, children develop psychomotor skills. The child surrenders to the play, he includes his physical abilities through the play develops memory, imagination, creative abilities, competitive spirit, discipline. The play teaches children modesty and honesty. Plays are those that basically satisfy the elementary needs of children for movement, seeing a broader satisfaction of the body's own need for growth and development. In addition to spending time in fun, the play builds active, healthy bodies. Not allowing the child to play means to stop his development, without play there is no healthy child, the play is the child's source of joy.

**Keywords:** play, children, preschool age, physical education

## MORFOLOŠKE KARAKTRISTIKE KAO PREDIKTIVNI FAKTOR BIOTIČKIH MOTORIČKIH ZNAJANJA

Vladan M. Pelemiš<sup>1</sup>, <sup>3</sup>Ivan Prskalo, Zoran  
Momčilović<sup>2</sup>, Vladimir Momčilović<sup>2</sup>

<sup>1</sup>Univerzitet u Beogradu Učiteljski fakultet,

<sup>2</sup>Univerzitet u Nišu Pedagoški fakultet Vranje,

<sup>3</sup>Sveučilište u Zagrebu Učiteljski fakultet

### SAŽETAK

Na uzorku od ukupno 56 ispitanika, podeljenih u dva subuzorka: 30 dečaka i 26 devojčice, izvršeno je merenje od 8 antropometrijskih mera i procena biotičkih motoričkih znanja putem motoričkog testa "The Test of Gross Motor Development" (TGMD-2). Cilj istraživanja bio je utvrditi polne razlike u morfološkim karakteristikama između dece predškolskog uzrasta kao i povezanost morfoloških karakteristika sa motoričkim testom za procenu biotičkih motoričkih znanja za oba pola. Rezultati istraživanja ukazuju na postojanje statistički značajnih razlika između dečaka i devojčica u morfološkim karakteristikama. Te razlike ispoljene su u motoričkom testu, tranverzalne dimenzionalnosti i potkožnoj masti u korist dečaka, te u longitudinalnoj dimenzionalnosti i volumenu i masi u korist devojčica. Dalje je utvrđeno da je sistem prediktorskih varijabli kod devojčica bio značajno povezan sa varijablom za procenu biotičkih motoričkih znanja, dok se to ne može konstatovati za dečake. Ovakva linearanost rezultata ukazuje da procenat telesne masti u telu umanjuje sposobnost devojčica u ostvarivanju boljih rezultata u motoričkom testu, koji je većim delom pod kontrolom sistema za strukturiranje kretanja. Takođe treba napomenuti da bi bilo dobro sa decom predškolskog uzrasta koristiti ovakve vidove motoričkih testova u kojima se dete više puta konfrontira sa različitim situacijama sa jedne strane, a sa druge strane poboljšava se brzina alternativnih pokreta ruku, eksplozivnost, te dobar deo mehanizma za strukturiranje kretanja. **Ključne reči:** analiza varijanse, povezanost, predškolski uzrast, morfološke karakteristike.

## MORPHOLOGICAL CHARACTERISTICS AS A PREDICTIVE FACTOR OF BIOTIC MOTOR KNOWLEDGE

### ABSTRACT

On a sample of a total of 56 subjects, divided into two subsamples: 30 boys and 26 girls, measurements of 8 anthropometric measures and assessment of biotic motor knowledge were performed using the motor test "The Test of Gross Motor Development" (TGMD-2). The aim of the study was to determine gender differences in morphological characteristics between preschool children as well as the association of morphological characteristics with the motor test for the assessment of biotic motor skills for both sexes. The results of the research indicate the existence of statistically significant differences between boys and girls in morphological characteristics. These differences were manifested in the motor test, transverse dimensionality and subcutaneous fat in favor of boys, and in longitudinal dimensionality and volume and mass in favor of girls. It was further determined that the system of predictor variables in girls was significantly related to the variable for the assessment of biotic motor knowledge, while this cannot be stated for boys. This linearity of results indicates that the percentage of body fat in the body reduces the ability of girls to achieve better results in the motor test, which is largely under the control of the movement structuring system. It should also be noted that it would be good to use these types of motor tests with preschool children in which the child repeatedly confronts different situations on the one hand, and on the other hand improves the speed of alternative hand movements, explosive power, and a good part of the structuring mechanism. movements.

**Keywords:** analysis of variance, correlation, preschool age, morphological characteristics.



## ISPITIVANJE POUZDANOSTI I VALJANOSTI TESTOVA PROMJENE SMJERA KRETANJA I REAKTIVNE AGILNOSTI KOD PACIJENATA NAKON OPERACIJE KOLJENA

Ivan Perić<sup>1</sup>, Barbara Gilić<sup>2,3</sup>, Damir Sekulić<sup>2</sup>

<sup>1</sup>Fakultet za dentalnu medicinu i zdravstvo, Sveučilište Josip Juraj Strossmayer u Osijeku, Hrvatska

<sup>2</sup>Kineziološki fakultet, Sveučilište u Splitu, Hrvatska

<sup>3</sup>Kineziološki fakultet, Sveučilište u Zagrebu, Hrvatska

### APSTRAKT

Agilnost je jedna od ključnih sposobnosti važnih za redukciju padova. Međutim, nedostaju testovi koji su primjenjivi za ispitivanje agilnosti kod netrenirane, starije i kliničke populacije. Cilj ovog istraživanja je bio ispitati pouzdanosti i valjanost novih testova promjene smjera kretanja (change of direction speed-CODS) i reaktivne agilnosti (RAG) kod kliničke populacije. U istraživanju je sudjelovalo 25 osoba starijih od 40 godina koji su imali operaciju koljena. Varijable su uključivale dob, spol, antropometrijske karakteristike, te rezultate u novim testovima agilnosti. Rezultati su prikazali da su novi testovi agilnosti pouzdani za ispitivanje agilnosti kod pacijenata nakon operacije koljena. Testovi su se prikazali valjanima u smislu diferenciranja ispitanika prema dobi i tjelesnoj težini (mlađi ispitanici i lakši ispitanici su postizali bolje rezultate kod oba testa). Ispitanici su u oba testa postizali podjednake rezultate i rezultati su visoko povezani, što ukazuje da testovi RAG i CODS kod ove populacije predstavljaju slične sposobnosti. Buduća istraživanja bi trebala ispitivati metrijske karakteristike predloženih testova kod drugačijih podskupina ispitanika.

**Ključne riječi:** motoričke sposobnosti, promjena smjera kretanja, ozljede, klinička populacija, odrasli

## INVESTIGATING RELIABILITY AND VALIDITY OF THE TESTS OF CHANGE OF DIRECTION AND REACTIVE AGILITY IN PATIENTS AFTER KNEE SURGERY

### ABSTRACT

Agility is one of the key performance factors important for fall reduction. There is a lack of tests applicable for testing agility in untrained, older and clinical populations. The aim of this research was to investigate the reliability and validity of the newly-designed testing protocol of change of direction speed (CODS) and reactive agility (RAG) in the clinical population. Research comprised 25 individuals older than 40 years of age who underwent knee surgery. Variables included age, gender, anthropometric characteristics, RAG, and CODS tests. Results displayed new tests as being reliable among patients after knee surgery. Also, tests were valid for discriminating age and body mass groups (with better results in younger and lighter participants). Participants achieved similar results in both tests, and those results were highly correlated, which implies that CODS and RAG represent similar abilities in this population. Future studies should investigate the metric characteristics of here proposed tests in different subsamples.

**Keywords:** motor capacities, change of direction, injury, clinical population, adults



## FITNESS PROGRAM „ANIMAL FLOW” U NASTAVNIM I TRENAŽNIM PROCESIMA

Lejla Šebić<sup>1</sup>, Adriana Ljubojević<sup>2</sup>, Tatjana Ćeremidžić<sup>3</sup>

<sup>1</sup>Fakultet sporta i tjelesnog odgoja Univerzitet u Sarajevu,

<sup>2</sup>Fakultet fizičkog vaspitanja i sporta. Univerzitet u Banja Luci

<sup>3</sup>Fakultet fizičkog vaspitanja i sporta Univerziteta u Istočnom Sarajevu

### SAŽETAK

Novi trendovi u fitness industriji sve se više okreću prirodi i prirodnim oblicima kretanja kako bi ljudskom tijelu vratili njegovu izvornu funkcionalnost. Resetovanje tijela na njegove primarne genetski urođene postavke dešava se upravo povratkom na one kretne strukture koje čine našu osnovu i početak. „Animal flow” ili životinjski tok predstavlja funkcionalni program vježbanja koji koristi prirodne oblike kretanja u prizemnim položajima na tlu, sa posebnim akcentom na unapređenje koordinacije, mobilnost i stabilnost zglobova, mišićne snage i izdržljivost. Osnovne karakteristike programa su velika raznolikost pokreta nadahnutih životinjama, koncept protoka u povezivanju pokreta i opterećenje sa vlastitom težinom tijela. Program se sastoji od šest komponenti treniga: mobilizacija zglobova, aktivacija mišića, specifično istezanje, putujući oblici, promjene i prijelazi, fluidnost. Svaka komponenta je dizajnirana za postizanje određenih rezultata, a mogu se kombinirati na više načina ili koristiti pojedinačno. Primjena ovog programa ima značajne benefite u rekreaciji, vrhunskom sportu kao i nastavi tjelesnog i zdravstvenog odgoja.

**Ključne riječi:** animal flow, grupni fitness, prirodni oblici kretanja, body weight

## FITNESS PROGRAM“ANIMAL FLOW”IN EDUCATIONAL AND TRAINING PROCESSES

### SUMMARY

Contemporary trends in the fitness industry are increasingly directing towards nature and natural forms of movement in order to return the body its authentic natural functionality. Resetting the body to its primary, genetically inherited settings is being performed exactly by returning to the movement structures which form our basis and the beginning. “Animal flow” is functional workout program which uses natural ground-based forms of movement with special emphasis on improving coordination, mobility, wrist stability, muscle strength and endurance. Basic characteristics of the program are versatility of movement inspired by animals, flow concept in linking the movements and body-weight load. The program consists of six workout components: wrist mobilization, muscle activation, specific stretching, traveling forms, switches - transitions and flows. Each component is designed to achieve certain results and they can be used individually or be combined. Application of this program has significant benefits in the recreational activities, top sport, but also in the educational process as part of Physical Education classes.

**Key words:** animal flow, group fitness, natural forms of movement, body weight

## EFIKASNOST FIZIOTERAPIJSKIH PROCEDURA KOD PACIJENATA STARIJE ŽIVOTNE DOBI

Senad Bajrić<sup>1</sup>, Gordan Bajić<sup>2</sup>, Armin Bojić<sup>3</sup>

<sup>1</sup>Pan-evropski Univerzitet "Apeiron", Fakultet sportskih nauka, Banja Luka

<sup>2</sup>Pan-evropski Univerzitet "Apeiron", Fakultet zdravstvenih nauka, Banja Luka

<sup>3</sup>Dispanzer za fizijatriju, Travnik

### SAŽETAK

Osnovni cilj ovog istraživanja je utvrđivanje efikasnosti fizioterapijskih procedura u procesu funkcionalnog osposobljavanja osoba starije životne dobi koje imaju degenerativne bolesti zglobova. Istraživanje je izvršeno na uzorku od 30 ispitanika-pacijenata starije životne dobi u Rehabilitacionom centru „Fojnica“ u Fojnici koje su imale osteoartritis koljena. Procjena bola i pokretljivosti zgloba koljena mjerena je prije i poslije primjene fizioterapijskih procedura u trajanju od 14 dana. U istraživanju su primjenjene sljedeće fizioterapijske procedure: kineziterapija, hidro-kineziterapija, elektroterapija, magnetoterapija, ultrazvuk, parafango.

Nakon provedenog fizioterapijskog programa došlo je do redukcije bola (vrijednost VAS skale prije tretmana iznosila je 6, poslije tretmana 3,6), i do povećanja obima pokreta u zglobu koljena (prije primjene fizioterapijskih procedura 66,65% pacijenata imalo je ograničenu fleksiju u zglobu koljena za više od 20 stepeni, a na kraju tretmana 43,32 % pacijenata; ograničenu ekstenziju prije fizioterapije imalo je 40% pacijenata, poslije fizioterapije 13,3%).

Dobijeni rezultati istraživanja ukazuju da su primijenjene fizioterapijske procedure efikasne u tretmanu osteoartritisa koljena kod osoba starije životne dobi.

**Ključne riječi:** fizioterapijske procedure, starije osobe, osteoartritis, zglob koljena

## EFFICACY OF PHYSIOTHERAPEUTIC PROCEDURES IN ELDERLY PATIENTS

Senad Bajrić<sup>1</sup>, Gordan Bajić<sup>2</sup>, Armin Bojić<sup>3</sup>

<sup>1</sup>Pan-European University "Apeiron", Faculty of Sports Sciences, Banja Luka

<sup>2</sup>Pan-European University "Apeiron", Faculty of Health Sciences, Banja Luka

<sup>3</sup>Physiotherapist, Travnik

### SUMMARY

The main goal of this research is to determine the effectiveness of physiotherapy procedures in the process of functional training of elderly people who have degenerative joint diseases. The research was performed on a sample of 30 elderly patients in the Rehabilitation Center "Fojnica" in Fojnica who had knee osteoarthritis. Assessment of knee joint pain and mobility was measured before and after the application of physiotherapy procedures for 14 days. The following physiotherapy procedures were used in this research: kinesitherapy, hydrokinesitherapy, electrotherapy, magnetotherapy, ultrasound, parafango.

After the physiotherapy program, there was a reduction in pain (the value of the VAS scale before treatment was 6, after treatment 3.6), and an increase in the volume of movement in the knee joint (before physiotherapy 66.65% of patients had limited flexion in the joint knees by more than 20 degrees, and at the end of treatment 43.32% of patients; limited extension before physiotherapy had 40% of patients, after physiotherapy 13.3%).

The obtained research results indicate that the applied physiotherapy procedures are effective in the treatment of osteoarthritis of the knee in the elderly.

**Key words:** physiotherapy procedures, elderly, osteoarthritis, knee joint

## FREKVENCIJA I STRUKTURA POREMEĆAJA DONJIH EKSTREMITETA KOD DJECE PREDŠKOLSKOG UZRASTA

Senad Bajrić, Velibor Srdić, Osmo Bajrić

*Pan-evropski Univerzitet "Apeiron", Banja Luka*

### SAŽETAK

Istraživanje je provedeno na uzorku od 266 ispitanika predškolskog uzrasta, uzrasne dobi 4 – 6 godina oba pola PU „Zvezdica“ iz Banja Luke. Od ukupnog broja ispitanika mušku populaciju činilo je 137 ispitanika, a žensku populaciju činilo je 129 ispitanika. Za procjenu prisustva deformiteta donjih ekstremiteta uzeti su poremećaji u zglobu koljena, genu varum (X noge), genu valgum (O) noge, genu recurvatum (hiperekstenzija nogu).

Osnovni cilj istraživanja bio je da se utvrdi stvarno stanje frekvencije i strukture poremećaja donjih ekstremiteta kod ispitanika predškolskog uzrasta PU „Zvezdica“ iz Banja Luke u odnosu na pol i uzrasnu dob. Frekvencije i struktura poremećaja donjih ekstremiteta prikazani tabelarno u odnosu na pol i uzrasnu dob ispitanika.

Rezultati istraživanja ukazuju na nešto veću frekvenciju prisutnosti poremećaja donjih ekstremiteta kod dječaka u odnosu na djevojčice, a najveća frekvencija prisutnosti utvrđena je kod ispitanika oba pola uzrasta od 4 godine, a nešto manja kod uzrasta ispitanika od 5 godina. Iznenađuje podatak da kod ispitanika oba pola uzrasta 6 godina nije utvrđena prisutnost niti jednog poremećaja. Međutim, i ovi rezultati nas obavezuju da moramo biti obazrivi i vršiti stalno i kontinuirano praćenje posturalnog statusa djece u cilju pravovremenog prepoznavanja tjelesnih poremećaja i preduzimanju adekvatnih aktivnosti na preventivnom i korektivnom radu.

Dobijeni rezultati treba da pokrenu aktivnosti u cilju pravovremenog dijagnosticiranja, kontrole i preduzimanja efikasnih programa korektivnog vježbanja kod djece predškolskog uzrasta.

**Cljučne riječi:** genu varum (X noge), genu valgum (O) noge, genu recurvatum (hiperekstenzija nogu), uzrasna dob, pol

## FREQUENCY AND STRUCTURE OF LOWER LIMBS DISORDERS IN PRESCHOOL CHILDREN

Senad Bajric, Velibor Srdic, Osmo Bajric

*Pan-European University "Apeiron", Banja Luka*

### SUMMARY

The research was conducted on a sample of 266 respondents of preschool age, ages 4-6 years of both sexes, from preschool institution "Zvezdica" in Banja Luka. Out of the total number of respondents, the male population consisted of 137 respondents, and the female population consisted of 129 respondents. To assess the presence of lower extremity deformities, disorders in the knee joint, genu varum (X legs), genu valgum (O legs), genu recurvatum (hyperextension of the knee) were taken.

The main goal of the research was to determine the actual state of frequency and structure of lower extremity disorders in subjects of preschool institution "Zvezdica" from Banja Luka in relation to gender and age. Frequencies and structure of lower extremity disorders are shown in a table in relation to the sex and age of the subjects.

The results of the research indicate a slightly higher frequency of lower extremity disorders in boys compared to girls. The highest frequency of presence was found in subjects of both sexes aged 4 years, and slightly lower in subjects aged 5 years. It is surprising that in the subjects of both sexes at the age of 6 years, the presence of these disorders was not determined.

However, these results also oblige us to be vigilant and to constantly and continuously monitor the postural status of children in order to timely identify physical disorders and take adequate activities in preventive and corrective work.

The obtained results should initiate activities in order to timely diagnose, control and undertake effective corrective exercise programs in preschool children.

**Keywords:** genu varum (X legs), genu valgum (O legs), genu recurvatum (hyperextension of the knee), age, sex

## STAVOVI TRENERA PREMA IZMJENI PRAVILA RUKOMETNE IGRE

Lucia Radošević<sup>1</sup>, Nenad Rogulj<sup>1</sup>, Nikola Foretić<sup>1</sup>, Vladimir Pavlinović<sup>1</sup>, Davor Karl<sup>2</sup>

<sup>1</sup>Kineziološki fakultet Sveučilišta u Splitu

<sup>2</sup>Srednja tehnička škola za strojarstvo i mehanotroniku, Split

### APSTRAKT

Glavni je cilj istraživanja bio utvrditi stavove trenera o mogućim izmjenama rukometnih pravila. U tu svrhu 2019. godine na Središnjem seminaru rukometnih trenera provedeno je istraživanje putem anonimne ankete. Uzorak se sastojao od 194 rukometna trenera različitog iskustva i rukometnog obrazovnog statusa koji je utvrđen obzirom na posjedovanje trenerske licence izdane od strane HRS-a. Anketa se sastojala od 24 pitanja od kojih su 23 pitanja ispitanicima pruženi odgovori dok je zadnje pitanje bilo rezervirano za iznošenje prijedloga i sugestija od strane trenera. Anketa je podijeljena na dva djela. Prvi se dio odnosio na pravila kojima bi se smanjila mogućnost sudačke pogreške dok se drugi dio ankete sastojao od izmjene pravila koja bi doprinijela atraktivnosti rukometne igre. Istraživanje je pokazalo da se većina trenera zalaže za uvođenje pet novih pravila, a to su: ograničenje napada na 30 sekundi, uvođenje VAR tehnologije, povećanje prostora za izmjenu igrača, uvođenje kapetana momčadi te da sedmerac izvodi igrač na kojem je sedmerac i dosuđen. Istraživanje je pokazalo da treneri ne žele previše izlaziti iz svoje zone „komfora“ i drastično utjecati na promjenu pravila rukometne igre.

**Ključne riječi:** rukomet, suđenje, trajanje napada, vremensko ograničenje

## HANDBALL COACHES' ATTITUDES TOWARDS POSSIBLE CHANGE OF THE GAME RULES

Lucia Radošević<sup>1</sup>, Nenad Rogulj<sup>1</sup>, Nikola Foretić<sup>1</sup>, Vladimir Pavlinović<sup>1</sup>, Davor Karl<sup>2</sup>

<sup>1</sup>Kineziološki fakultet Sveučilišta u Splitu

<sup>2</sup>Srednja tehnička škola za strojarstvo i mehanotroniku, Split

### ABSTRACT

The main goal of the research was to determine the coaches' attitudes regarding possible changes of handball rules. For this purpose, a research was conducted at the Central seminar for handball coaches in 2019. Anonymous survey was applied. The sample consisted of 194 handball coaches of different experience and handball educational status determined via their CHF license. The survey consisted of 24 questions of which 23 questions had multiple choice answers provided. The survey was divided into two parts. The first part was reserved for questions regarding reducing the possibility of judging errors. The second part of the survey consisted of questions regarding rules that could contribute to the attractiveness of the handball game. Research has shown that most coaches are in favor of introducing five new rules. Those changed rules were: limiting attack duration to 30 seconds, introducing VAR technology, increasing the space for player change, introducing a team captain, and 7-meter throw performance by the player on whom the 7-meter throw is awarded. It turns out that coaches do not want to go too much out of their comfort zone and drastically change the rules of the handball game.

**Keywords:** handball, referee, attack duration, time limit, penalty

## POVEZANOST MOTORIČKIH SPOSOBNOSTI I SKOKA UVIS KOD JEDANAESTOGODIŠNJIH UČENIKA

**Bojan Babin**

*Sveučilište u Splitu, Filozofski fakultet, Republika Hrvatska*

## CORRELATION BETWEEN MOTOR ABILITIES AND HIGH JUMP IN ELEVEN-YEAR-OLD PUPILS

**Bojan Babin**

*University of Split, Faculty of Humanities and Social Sciences, Republic of Croatia*

### SAŽETAK

Istraživanje je provedeno s ciljem utvrđivanja povezanosti motoričkih sposobnosti i testa motoričkog znanja Skok uvis prekoračnom tehnikom kod učenika petih razreda osnovne škole. U skladu s postavljenim ciljem na uzorku od 152 učenika osnovnih škola u Splitu, Republika Hrvatska, u dobi od 11 godina ( $\pm 6$  mjeseci) primijenjen je skup od 21 testa motoričkih sposobnosti i testa motoričkog znanja Skok uvis prekoračnom tehnikom koji je predstavljao kriterijsku varijablu. Rezultati multiple regresijske analize pokazali su značajnu povezanost prediktorskog skupa manifestnih motoričkih varijabli s kriterijskom varijablom Skok uvis prekoračnom tehnikom. Najveći parcijalni doprinos u definiranju značajnosti regresijskog modela pokazale su varijable Izdržaj u visu zgibom i Trčanje 20 m iz visokog starta. Rezultati ovog istraživanja pridonijet će učinkovitijem planiranju i programiranju za što efikasnije postizanje poželjne razine finalnih stanja pojedinih antropoloških obilježja te za praćenje i vrednovanje u nastavi tjelesne i zdravstvene kulture kod jedanaestogodišnjih učenika.

**Ključne riječi:** motorička znanja, planiranje i programiranje, učenici petih razreda, vrednovanje

### ABSTRACT

The aim of the conducted research was to determine correlation between motor abilities and the motor skill test High Jump Scissors Technique in eleven-year-old primary-school pupils. In conformity with the set objective, on the sample of 152 primary-school pupils from Split, Republic of Croatia, aged 11 ( $\pm 6$  months), a set of 21 motor abilities tests and the motor skill test High Jump Scissors Technique, which represented the criterion variable, were applied. The results for multiple regression analysis indicated a significant correlation of the predictor group of manifest motor variables with the criterion variable High Jump Scissors Technique. The highest partial contribution in defining significance of the regression model were shown by the variables Bent Arm Hang and 20m High-Start Run. The results of this study will contribute to a more efficient planning and programming aiming at a more efficient level of final condition of certain anthropological features and at monitoring and assessment of eleven-year-old pupils in Physical Education classes.

**Key words:** motor skills, planning and programming, fifth-grade pupils, assessment

## MORFOLOŠKA SPECIFIKACIJA STOJA NA RUKAMA UZ OKOMITU PLOHU KOD JEDANAESTOGODIŠNJIH UČENICA

Lidija Vlahović

*Sveučilište u Splitu, Filozofski fakultet, Republika  
Hrvatska*

### SAŽETAK

Cilj istraživanja bio je utvrditi povezanost između morfoloških karakteristika i motoričkog znanja Stoj na rukama uz okomitu plohu kod učenica petog razreda osnovnih škola u Splitu. Sukladno cilju istraživanja na uzorku od 152 učenice u dobi od 11 godina ( $\pm 6$  mjeseci) primijenjen je skup od 16 antropometrijskih mjera za procjenu morfoloških karakteristika i test motoričkog znanja Stoj na rukama uz okomitu plohu. Rezultati regresijske analize pokazali su statistički značajnu povezanost morfoloških karakteristika s motoričkim znanjem Stoj na rukama uz okomitu plohu kod učenica. Analiza parcijalnog doprinosa pojedinih morfoloških varijabli na značajnost regresijskog modela ukazala je kako statistički značajan doprinos imaju varijable Kožni nabor trbuha i Dijametar lakta. Rezultati istraživanja pružili su korisne informacije o morfološkoj specifikaciji motoričkog znanja Stoj na rukama uz okomitu plohu pa time i njegove uloge u transformaciji pojedinih morfoloških karakteristika za postizanje željenih finalnih stanja u procesu planiranja i programiranja u Tjelesnoj i zdravstvenoj kulturi. Također, ukazuju i na to koje morfološke karakteristike treba uvažavati kako bi u procesu praćenja i vrednovanja učenice postizale što bolje rezultate kod ocjenjivanja ovog motoričkog zadatka.

**Ključne riječi:** motorička znanja, motoričko učenje, planiranje i programiranje, Tjelesna i zdravstvena kultura, učenice petih razreda

## THE MORPHOLOGICAL SPECIFICATION OF HANDSTAND AGAINST A VERTICAL SURFACE IN ELEVEN-YEAR-OLD FEMALE PUPILS

Lidija Vlahović

*University of Split, Faculty of Humanities and Social  
Sciences, Republic of Croatia*

### ABSTRACT

The aim of the conducted research was to determine correlation between morphological characteristics and the motor skill Handstand Against a Vertical Surface in fifth-grade primary-school female pupils from Split. In conformity with the set objective, on the sample of 152 primary-school female pupils from Split, Republic of Croatia, aged 11 ( $\pm 6$  months), a set of 16 anthropometric measurements for assessment of morphological characteristics and the motor skill test Handstand Against a Vertical Surface, were applied. The results for multiple regression analysis indicated a statistically significant correlation between morphological characteristics and the motor skill Handstand Against a Vertical Surface in female students. The analysis of partial contribution of certain morphological variables on the significance of the regression model indicated a statistically significant contribution in the variables Abdomen Skinfold and Elbow Diameter. The research results provided useful information on morphological specification of the motor skill Handstand Against a Vertical Surface and thus its role in transformation of certain morphological characteristics for achieving desired final conditions in the process of planning and programming Physical Education classes. Moreover, they also imply which morphological characteristics should be considered in order for female pupils to achieve best possible results during the assessment process of this motor task.

**Key words:** motor skills, motor learning, planning and programming, Physical Education, fifth-grade female pupils

## RELATIONS BETWEEN ANTHROPOMETRIC DIMENSIONS AND MOTORIC TESTS IN MANIFESTED AREA

Shkelzen Shala<sup>1</sup>, Valon Nikqi<sup>1</sup>, Iber Alaj<sup>2</sup> & Žarko Kostovski

<sup>1</sup> Faculty of Physical Education, Sport and Health, Macedonia, doctoral studies

<sup>2</sup> European University KALLOS Tuzla

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### ABSTRACT

Given the importance of anthropometric dimensions at the level of manifestation of many motor skills, especially in the successful realization of many techniques, a model of tests is constructed which is consisted from 5 anthropometric variables and 13 motor variables in the samples of karate competitors. 37 males, aged between 18-30 years, were treated with 5 anthropometric variables and 13 motor variables. The main purpose of the work was to ascertain that to what extent the results of the motor tests can be predicted based on some anthropometric parameters. By means of the Linear Regression method, it has been proved that these results can be predicted through some explosive force tests and in the speed tests of the moving frequencies.

**Key words:** Dimensions, Samples, Variables, Anthropometric, Motoric.



## EFIKASNOST FIZIOTERAPIJSKIH PROCEDURA KOD PACIJENATA STARIJE ŽIVOTNE DOBI

Senad Bajrić<sup>1</sup>, Gordan Bajić<sup>2</sup>, Armin Bojić<sup>3</sup>

<sup>1</sup>Pan-evropski Univerzitet "Apeiron", Fakultet sportskih nauka, Banja Luka

<sup>2</sup>Pan-evropski Univerzitet "Apeiron", Fakultet zdravstvenih nauka, Banja Luka

<sup>3</sup>Dispanzer za fizijatriju, Travnik

## EFFICACY OF PHYSIOTHERAPEUTIC PROCEDURES IN ELDERLY PATIENTS

Senad Bajrić<sup>1</sup>, Gordan Bajić<sup>2</sup>, Armin Bojić<sup>3</sup>

<sup>1</sup>Pan-European University "Apeiron", Faculty of Sports Sciences, Banja Luka

<sup>2</sup>Pan-European University "Apeiron", Faculty of Health Sciences, Banja Luka

<sup>3</sup>Physiotherapist, Travnik

### SAŽETAK

Osnovni cilj ovog istraživanja je utvrđivanje efikasnosti fizioterapijskih procedura u procesu funkcionalnog osposobljavanja osoba starije životne dobi koje imaju degenerativne bolesti zglobova. Istraživanje je izvršeno na uzorku od 30 ispitanika-pacijenata starije životne dobi u Rehabilitacionom centru „Fojnica“ u Fojnici koje su imale osteoartritis koljena. Procjena bola i pokretljivosti zgloba koljena mjerena je prije i poslije primjene fizioterapijskih procedura u trajanju od 14 dana. U istraživanju su primjenjene sljedeće fizioterapijske procedure: kineziterapija, hidro-kineziterapija, elektroterapija, magnetoterapija, ultrazvuk, parafango.

Nakon provedenog fizioterapijskog programa došlo je do redukcije bola (vrijednost VAS skale prije tretmana iznosila je 6, poslije tretmana 3,6), i do povećanja obima pokreta u zglobu koljena (prije primjene fizioterapijskih procedura 66,65% pacijenata imalo je ograničenu fleksiju u zglobu koljena za više od 20 stepeni, a na kraju tretmana 43,32 % pacijenata; ograničenu ekstenziju prije fizioterapije imalo je 40% pacijenata, poslije fizioterapije 13,3%).

Dobijeni rezultati istraživanja ukazuju da su primijenjene fizioterapijske procedure efikasne u tretmanu osteoartritisa koljena kod osoba starije životne dobi.

**Ključne riječi:** fizioterapijske procedure, starije osobe, osteoartritis, zglob koljena

### SUMMARY

The main goal of this research is to determine the effectiveness of physiotherapy procedures in the process of functional training of elderly people who have degenerative joint diseases. The research was performed on a sample of 30 elderly patients in the Rehabilitation Center "Fojnica" in Fojnica who had knee osteoarthritis. Assessment of knee joint pain and mobility was measured before and after the application of physiotherapy procedures for 14 days. The following physiotherapy procedures were used in this research: kinesitherapy, hydrokinesitherapy, electrotherapy, magnetotherapy, ultrasound, parafango.

After the physiotherapy program, there was a reduction in pain (the value of the VAS scale before treatment was 6, after treatment 3.6), and an increase in the volume of movement in the knee joint (before physiotherapy 66.65% of patients had limited flexion in the joint knees by more than 20 degrees, and at the end of treatment 43.32% of patients; limited extension before physiotherapy had 40% of patients, after physiotherapy 13.3%).

The obtained research results indicate that the applied physiotherapy procedures are effective in the treatment of osteoarthritis of the knee in the elderly.

**Key words:** physiotherapy procedures, elderly, osteoarthritis, knee joint



## FREKVENCIJA I STRUKTURA POREMEĆAJA DONJIH EKSTREMITETA KOD DJECE PREDŠKOLSKOG UZRASTA

Senad Bajrić, Velibor Srdić, Osmo Bajrić

*Panevropski Univerzitet "Apeiron", Banja Luka*

### SAŽETAK

Istraživanje je provedeno na uzorku od 266 ispitanika predškolskog uzrasta, uzrasne dobi 4 – 6 godina oba pola PU „Zvezdica“ iz Banja Luke. Od ukupnog broja ispitanika mušku populaciju činilo je 137 ispitanika, a žensku populaciju činilo je 129 ispitanika. Za procjenu prisustva deformiteta donjih ekstremiteta uzeti su poremećaji u zglobu koljena, genu varum (X noge), genu valgum (O) noge, genu recurvatum (hiperekstenzija nogu).

Osnovni cilj istraživanja bio je da se utvrdi stvarno stanje frekvencije i strukture poremećaja donjih ekstremiteta kod ispitanika predškolskog uzrasta PU „Zvezdica“ iz Banja Luke u odnosu na pol i uzrasnu dob. Frekvencije i struktura poremećaja donjih ekstremiteta prikazani tabelarno u odnosu na pol i uzrasnu dob ispitanika.

Rezultati istraživanja ukazuju na nešto veću frekvenciju prisutnosti poremećaja donjih ekstremiteta kod dječaka u odnosu na djevojčice, a najveća frekvencija prisutnosti utvrđena je kod ispitanika oba pola uzrasta od 4 godine, a nešto manja kod uzrasta ispitanika od 5 godina. Iznenađuje podatak da kod ispitanika oba pola uzrasta 6 godina nije utvrđena prisutnost niti jednog poremećaja. Međutim, i ovi rezultati nas obavezuju da moramo biti obazrivi i vršiti stalno i kontinuirano praćenje posturalnog statusa djece u cilju pravovremenog prepoznavanja tjelesnih poremećaja i preduzimanju adekvatnih aktivnosti na preventivnom i korektivnom radu.

Dobijeni rezultati treba da pokrenu aktivnosti u cilju pravovremenog dijagnosticiranja, kontrole i preduzimanja efikasnih programa korektivnog vježbanja kod djece predškolskog uzrasta.

**Cljučne riječi:** genu varum (X noge), genu valgum (O) noge, genu recurvatum (hiperekstenzija nogu), uzrasna dob, pol

## FREQUENCY AND STRUCTURE OF LOWER LIMBS DISORDERS IN PRESCHOOL CHILDREN

Senad Bajric, Velibor Srdic, Osmo Bajric

*Pan-European University "Apeiron", Banja Luka*

### SUMMARY

The research was conducted on a sample of 266 respondents of preschool age, ages 4-6 years of both sexes, from preschool institution "Zvezdica" in Banja Luka. Out of the total number of respondents, the male population consisted of 137 respondents, and the female population consisted of 129 respondents. To assess the presence of lower extremity deformities, disorders in the knee joint, genu varum (X legs), genu valgum (O legs), genu recurvatum (hyperextension of the knee) were taken.

The main goal of the research was to determine the actual state of frequency and structure of lower extremity disorders in subjects of preschool institution "Zvezdica" from Banja Luka in relation to gender and age. Frequencies and structure of lower extremity disorders are shown in a table in relation to the sex and age of the subjects.

The results of the research indicate a slightly higher frequency of lower extremity disorders in boys compared to girls. The highest frequency of presence was found in subjects of both sexes aged 4 years, and slightly lower in subjects aged 5 years. It is surprising that in the subjects of both sexes at the age of 6 years, the presence of these disorders was not determined.

However, these results also oblige us to be vigilant and to constantly and continuously monitor the postural status of children in order to timely identify physical disorders and take adequate activities in preventive and corrective work.

The obtained results should initiate activities in order to timely diagnose, control and undertake effective corrective exercise programs in preschool children.

**Keywords:** genu varum (X legs), genu valgum (O) legs, genu recurvatum (hyperextension of the knee), age, sex

## PROMJENE MOTORIČKIH SPOSOBNOSTI POD UTICAJEM PROGRAMA DODATNE NASTAVE FIZIČKOG VASPITANJA

Velibor Srđić<sup>1</sup>, Boris Jeličić<sup>2</sup>, Senad Bajrić<sup>1</sup>

<sup>1</sup>Pan-evropski univerzitet "Apeiron", Fakultet sportskih nauka, Banja Luka, Bosna i Hercegovina

<sup>2</sup>Srednjoškolski centar "GEMIT-Apeiron" Banja Luka, Bosna i Hercegovina

## CHANGES IN MOTOR ABILITIES UNDER THE INFLUENCE OF EXTENDED PHYSICAL EDUCATION CLASSES PROGRAMME

Velibor Srđić<sup>1</sup>, Boris Jeličić<sup>2</sup>, Senad Bajrić<sup>1</sup>

<sup>1</sup>Pan-European University "Apeiron", Faculty of Sports Sciences, Banja Luka, Bosnia and Herzegovina

<sup>2</sup>Gemit-Apeiron High School Center Banja Luka, Bosnia and Herzegovina

### APSTRAKT

Cilj istraživanja je utvrđivanje globalnih kvantitativnih promjena motoričkih sposobnosti kod srednjoškolaca pod uticajem dodatne nastave fizičkog vaspitanja. Uzorak ispitanika činio je 51 učenik, muškog pola, uzrasta 15 do 18 godina, iz Srednjoškolskog centra "Gemit-Apeiron" Banja Luka. Cjelokupan uzorak je podijeljen na dva subuzorka, eksperimentalnu grupu (N=25) i kontrolnu grupu (N=26). Sa eksperimentalnom grupom je realizovana dodatna nastava u trajanju od tri mjeseca, a kontrolna grupa je radila po standardnom planu i programu nastave fizičkog vaspitanja. Uzorak varijabli za procjenu motoričkih sposobnosti činio je set od 7 testova. U cilju utvrđivanja kvantitativnih promjena motoričkih sposobnosti na globalnom nivou primijenjena je kanonička diskriminativna analiza. Analizom rezultata kanoničke diskriminativne analize vidljivo je da je program dodatne nastave kod učenika eksperimentalne grupe proizveo pozitivne promjene motoričkih sposobnosti, a koje su se najznačajnije odnosile na povećanje agilnosti, segmentarne brzine, fleksibilnosti i ravnoteže. Dobljeni rezultati ovog istraživanja mogu doprinijeti nastavnicima i profesorima fizičkog vaspitanja u kvalitetnijem planiranju sadržaja dodatne nastave fizičkog vaspitanja.

Ključne riječi: globalne kvantitativne promjene, dodatna nastava, motoričke sposobnosti, učenici.

### ABSTRACT

The aim of the research is to determine global quantitative changes in motor abilities in high school students under the influence of additional physical education classes programme. The respondents' sample consisted of 51 male students, aged 15 to 18, from the High School Center "Gemit-Apeiron" Banja Luka. The whole sample was divided into two subsamples, an experimental group (N = 25), an control group (N = 26). Additional classes lasting three months were realized with the experimental group, and the control group worked according to the standard curriculum of physical education. A sample of variables to assess motor abilities consisted of a set of 7 tests. In order to determine quantitative changes in motor abilities at the global level, canonical discriminant analysis was applied. The analysis of the results of the canonical discriminant analysis shows that the program of extended classes programme in the students of the experimental group produced positive changes in motor abilities, which were most significantly related to increasing agility, segmental speed, flexibility and balance. The obtained results of this research can contribute to teachers and professors of physical education in better planning of the content of additional physical education classes.

**Key words:** global quantitative changes, additional teaching, motor abilities, students.

## POVEZANOST MOTORIČKIH SPOSOBNOSTI SA SITUACIONO MOTORIČKIM SPOSOBNOSTIMA MLADIH KOŠARKAŠA

Srboljub Vuković<sup>1</sup>, Milan Anđelić<sup>2</sup>, Dejan Čeremidžić<sup>3</sup>

<sup>1</sup>Fakultet sportskih nauka Apeiron,

<sup>2</sup>Košarkaški klub Budućnost Podgorica,

<sup>3</sup>Fakultet fizičkog vaspitanja i sporta Istočno Sarajevo

### SAŽETAK

Košarka kao igra ima karakterističan visok ritam aktivnosti što od sportiste zahtjeva maksimalne napore i visok nivo bazično-motoričkih i specifično-motoričkih sposobnosti. Cilj istraživanja je bio da se utvrdi povezanost bazično motoričkih sposobnosti sa situaciono motoričkim sposobnostima košarkaša uzrasta 14 godina ( $\pm 6$  mjeseci). Istraživanjem je obuhvaćen uzorak od 50 košarkaša Košarkaškog kluba "Podgorica" iz Podgorice. Za procjenu motoričkih sposobnosti korišćeni su testovi: Bacanje medicinke iz stojećeg položaja, Skok u dalj, Sardžent test, Taping rukom, Trčanje na 50 m visokim startom, T-test, Slalom sa tri medicinke, Skok preko vijače, Špagat test, Duboki prtklon na klupici, Iskret palicom, dok su za procjenu situaciono motoričkih sposobnosti korišćeni testovi: Skok šut sa mjesta- istog rastojanja- sa promjenom pravca-bez upotrebe table, Ubacivanje u koš polaganjem iz vođenja, Skok šut sa mjesta-različitog rastojanja-istog pravca, Elevaciona preciznost jenom rukom, Elevaciona preciznost sa obje ruke, Gađanje pokretne lopte klatna direktno, Vođenje lopte naprijed nazad-između četiri linije košarkaškog terena, Vođenje lopte u krug, Cik cak vođenje oko linija odbojkaškog terena sa promjenom ruke. Generalno gledano, možemo zaključiti da je polazna hipoteza djelimično potvrđena jer se pokazalo da obuhvaćene motoričke sposobnosti ostvaruju pretpostavljenu povezanost sa situaciono-motoričkom varijablom kretanje igrača sa loptom ali kada su u pitanju preciznost ubacivanja lopte u koš i preciznost dodavanja lopte pojedine motoričke sposobnosti ne ostvaruju očekivanu značajnu povezanost. Akcenat u radu sa mlađim kategorijama treba staviti na dugoročan process razvoja, kako bi se omogućio bolji uspjeh u seniorskom uzrastu.

**Cljučne riječi:** bazično-motoričke sposobnosti, situaciono-motoričke sposobnosti, mladi košarkaši, regresiona analiza.

## RELATIONSHIP BETWEEN MOTOR SKILLS AND SITUATIONAL MOTOR SKILLS OF YOUNG BASKETBALL PLAYERS

Srboljub Vukovic<sup>1</sup>, Milan Andjelic<sup>2</sup>, Dejan Ceremidzic<sup>3</sup>

<sup>1</sup>Faculty of Sports Sciences Apeiron,

<sup>2</sup>Basketball Club Budućnost Podgorica,

<sup>3</sup>Faculty of Physical Education and Sports East Sarajevo

### ABSTRACT

Basketball as a game has a characteristic high rhythm of activity, which requires maximum effort from the athlete and a high level of basic-motor and specific-motor abilities. The aim of the study was to determine the relationship between basic motor skills and situational motor abilities of basketball players aged 14 years ( $\pm 6$  months). The research included a sample of 50 basketball players from the Basketball Club „Podgorica“ from Podgorica. The following tests were used to assess motor skills: Throwing a medic from a standing position, Long jump, Sargent test, Taping with the hand, Running at 50 m high start, T-test, Slalom with three medics, Jump over a screw, Twine test, Deep bowing on bench, Bending with a stick, while tests were used to assess situational motor abilities: Jump shot from a place-same distance- with change of direction-without the use of a board, Insert into the basket by passing from the guide, Jump shot from a place-different distance-same direction, Elevation precision with one hand, Elevation precision with both hands, Shooting the pendulum ball directly, Guiding the ball back and forth-between the four lines of the basketball court, Guiding the ball in a circle, Zig even guiding around the lines of the volleyball court with a change of hand. In general, we can conclude that the initial hypothesis was partially confirmed because it was shown that the included motor skills have a presumed relationship with the situational-motor variable movement of the player with the ball, but when it comes to the accuracy of throwing the ball into the basket and the accuracy of passing the ball. significant connectivity. Emphasis in working with younger categories should be placed on the long-term development process, in order to enable better success in senior age.

**Key words:** basic-motor abilities, situational-motor abilities, young basketball players, regression analysis.

## EFEKTI FIZIČKIH AKTIVNOSTI NA KONTROLU DIJABETESA - TIP 2

Milan Anđelić<sup>1</sup>, Srboljub Vuković<sup>2</sup>, Milomir Trivun<sup>3</sup>, Dejan Ćeremiđić<sup>3</sup>

<sup>1</sup>Košarkaški klub Budućnost Podgorica,

<sup>2</sup>Fakultet sportskih nauka Apeiron,

<sup>3</sup>Fakultet fizičkog vaspitanja i sporta Istočno Sarajevo

## EFFECTS OF PHYSICAL ACTIVITY ON DIABETES CONTROL - TYPE 2

Milan Andjelic<sup>1</sup>, Srboljub Vukovic<sup>2</sup>, Milomir Trivun<sup>3</sup>, Dejan Ceremidzic<sup>3</sup>

<sup>1</sup>Basketball Club Budućnost Podgorica,

<sup>2</sup>Faculty of Sports Sciences Apeiron,

<sup>3</sup>Faculty of Physical Education and Sports East Sarajevo

### SAŽETAK

Redovna fizička aktivnost se smatra od davnina važnom karikom u kontroli dijabetesa uz adekvatnu ishranu i prepisanu terapiju. Međutim, tek u posljednje dvije decenije imamo na raspolaganju dokaze zasnovane na kliničkim studijama, koje su potvrdile značaj fizičke aktivnosti u kontroli dijabetesa. Usvajanje i praktikovanje redovne fizičke aktivnosti su ključni za održavanje nivoa glukoze u krvi i cjelokupno zdravlje osoba sa dijabetesom i insulinskom rezistencijom. Cilj ovoga rada je bio da se prikupe dosadašnja istraživanja koja su se bavila efektima fizičkih aktivnosti na kontrolu dijabetesa-tip 2. Za prikupljanje i analizu ciljanih istraživanja korišćena je deskriptivna metoda i teorijska analiza, a istraživanja do kojih se došlo pretraživana su na Google Scholar, PabMed, Scopus i SCI. Pretraga je ograničena na radove koji su objavljeni u periodu od 2003. do 2018. godine. Rezultati istraživanja su pokazali da individualno dozirana fizička aktivnost značajno redukuje faktore rizika, prije svega metaboličke i od neospornog je značaja.

**Ključne riječi:** faktori rizika, vježbanje, gojaznost, insulin

### ABSTRACT

Regular physical activity has long been considered an important link in diabetes control with adequate nutrition and prescribed therapy. However, it is only in the last two decades that we have evidence based on clinical studies, which has confirmed the importance of physical activity in the control of diabetes. Adopting and practicing regular physical activity is key to maintaining blood glucose levels and the overall health of people with diabetes and insulin resistance. The aim of this paper was to collect previous research that dealt with the effects of physical activity on the control of type 2 diabetes. A descriptive method and theoretical analysis were used to collect and analyze targeted research, and the research was searched on Google Scholar, PubMed, Scopus and SCI. The search is limited to works published in the period from 2003 to 2018. The results of the research showed that individually dosed physical activity significantly reduces risk factors, primarily metabolic and is of undeniable importance.

**Key words:** risk factors, exercise, obesity, insulin

## UTICAJ FIZIČKE AKTIVNOSTI NA MIKROCIRKULATORNE PROMJENE KOD ZDRAVIH TRUDNICA

Vesna Ljubojević, Vlatka Bojanić, Saša Skočić  
Smoljanović

### APSTRAKT

Kod trudnica fizička aktivnost se navodi kao preventivna mjera oboljenja kardiovaskularnog sistema. U studijama podaci o mikrovaskularnoj adaptaciji u trudnoći su oskudni. Potrebna su dalja istraživanja mikrovaskularnih promjena u normalnoj trudnoći i uticaja fizičke aktivnosti. U prenatalnom programu bilo je uključeno 35 trudnica koje su vježbale i 35 koje nisu. Oblik i broj kapilara kožnog nabora nokta je analiziran sa kapilaroskopijom. Na početku studije oblik kapilara je bio normalan kod svih trudnica. Nakon 8 nedelja kod 40.91 % trudnica koje su vježbale i kod 47.06 % trudnica koje nisu vježbale, oblik kapilarnih petlji je bio abnormalan sa savijanjem krakova, tortuozitetom krakova i ukrštanjem krakova. Nakon 8. nedelja prenatalnog programa između trudnica koje su izvodile prenatalne vježbe i trudnica koje nisu nije utvrđena značajna razlika u obliku kapilarnih petlji kožnog nabora nokta, mada primjećuje se lagano smanjenje procenta abnormalnih kapilara kod trudnica koje su izvodile prenatalne vježbe.

**Ključne riječi:** fizička aktivnost, mikrocirkulacija, kapilaroskopija, trudnoća

## INFLUENCE OF PHYSICAL ACTIVITY ON MICROCIRCULATORY CHANGES IN HEALTHY PREGNANT WOMEN

Vesna Ljubojević, Vlatka Bojanić, Saša Skočić  
Smoljanović

### ABSTRACT

In pregnancy, physical activity is considered as a preventive measure for diseases of the cardiovascular system. In studies, the data on microvascular adaptation in pregnancy are scarce. Further research on the microvascular changes in normal pregnancy and the impact of physical activity is required. The prenatal program included 35 pregnant women who exercised and 35 women who did not. The shape and the number of capillaries of the nail skin fold was analyzed with capillaroscopy. At the beginning of the study, the shape was normal in all pregnant women. After 8 weeks in 40.91% of pregnant women who exercised and in 47.06% of pregnant women who did not exercise, the shape of the capillary loops was abnormal with bending of the limbs, tortuosity of the limbs and crossing of the limbs. After the 8th week of the prenatal program, no significant difference in the shape of the capillary loop of the nail skin fold was found between pregnant women who performed prenatal exercises and pregnant women who did not, although a slight decrease in the percentage of abnormal capillaries was observed in pregnant women who performed prenatal exercises.

**Key Words:** activity, physical, microcirculation, capillaroscopy, pregnancy

## KOREKTIVNE VJEŽBE DRŽANJA TIJELA SLIJEPIH UČENIKA PROVEDBOM INDIVIDUALNOG PROGRAMA ORJENTACIJE I MOBILITETA

**Amela Teskeredžić, Hurma Begić Jahić**

*Univerzitet u Tuzli, Edukacijsko-rehabilitacijski fakultet  
Univerzitet u Tuzli*

### **APSTRAKT**

Imajući u vidu da mobilitet sadrži dvije komponente: mentalnu orijentaciju i tjelesnu lokomotivnu, željeli smo utvrditi da li kontinuiranim individualnim programiranim vježbanjem orijentacije i mobiliteta možemo uticati na pravilno držanje tijela slijepih učenika. Istraživanje je urađeno na uzorku od 40 slijepih učenika uzrasta od 7 do 18 godina, oba spola, koji pohađaju odgojno-obrazovni proces u "Centru za slijepu i slabovidnu djecu i omladinu" u Sarajevu, od čega je uzorkom obuhvaćeno 17 ispitanika muškog i 23 ispitanika ženskog spola. Osnovni kriterij za formiranje uzorka je da su učenici sa amaurozom i bez dodatnih oštećenja, a koji se služe bijelim štapom. Urađeno je inicijalno i finalno testiranje, primjenom korištenog mjernog instrumenta, prije i nakon provedenog individualnog tretmana. Rezultati su pokazali pozitivne pomake u pravilnom držanju tijela kod ispitanika koji su obuhvaćeni individualnim programiranim vježbanjem.

**Ključne riječi:** slijepi učenici, orijentacija i mobilitet, mentalna orijentacija, držanje tijela

### **ABSTRACT**

Taking into account that mobility includes two components: mental orientation and body locomotion, we wanted to determine could we influence to appropriate blind students body posture by continual, individual and programmed orientation and mobility training. Examination was made on sample of 40 blind students from 7 to 18 years old, both sexes, who attend school in the Centre for blind children and youth in Sarajevo 17 male and 23 female. Fundamental criteria for sample were blind students without additional impairments who use white cane. Initial and final testing was performed, by measuring instrument which, was used before and after individual treatment. Result showed positive moving in appropriate body posture in examinees who had individual, programmed training.

**Key words:** blind students, orientation and mobility, mental orientation, body posture.

## RELATION BETWEEN DIMENSIONS ON CATTELL'S 16PF AND COLOUR ASSOCIATION METHOD IN ELITE HANDBALL

**Marijana Mladenović**

*College of Sports and Health, Belgrade, Serbia*

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### **ABSTRACT**

Studies have demonstrated that personality traits and mental state of athletes are related to sport success. The aim of this research was to explore relation between one trait based personality data (16PF) and state based personality measures (CA method). Sample included 17 handball players, members of Serbian national senior women's handball team. Age range was from 19 to 34 years. Two instruments were applied, Cattell's 16PF inventory and CA method. Descriptive statistics and Pearson correlation were applied. Results indicate statistically significant relations between some trait and state measures. Personality dimension on 16PF called "rule-consciousness" is significantly and positively correlated with dimensions of CA method named "risk" and "effort". Significant and negative correlation is obtained between "social boldness" dimension of 16PF and "fatigue" dimension of CA method. Findings from this research provide contribution to scientific studies in handball.

**Key words:** 16PF, CA method, personality trait, mental state, handball



## RAZLIKE U PROSTORU MOTORIČKIH SPOSOBNOSTI UČENICA KOJE SE BAVE SPORTOM I NESPORTAŠICA

Osmo Bajrić<sup>1</sup>, Darko Božić<sup>1</sup>, Rašid Hadžić<sup>2</sup>

<sup>1</sup>Panevropski Univerzitet "Apeiron", Fakultet sportskih nauka, Banja Luka

<sup>2</sup>Fakultet sporta i fizičkog vaspitanja, Nikšić

## DIFFERENCES IN THE SPACE OF MOTOR ABILITIES ATHLETES STUDENTS AND NON-ATHLETES

Osmo Bajrić<sup>1</sup>, Darko Božić<sup>1</sup>, Rašid Hadžić<sup>2</sup>

<sup>1</sup>Paneuropien University Apeiron, Faculty of Sports Science, Banja Luka

<sup>2</sup>Faculty of Sports and Physical Education, Nikšić

### SAŽETAK:

Osnovni cilj ovog istraživanja je utvrđivanje parcijalnih kvantitativnih razlika u motoričkim sposobnostima učenica uzrasta od 13 - 15 godina, koje se bave sportom i nesportašica. Za realizaciju ovog istraživanja tretiran je uzorak od 170 učenica od kojih 70 redovno posjećuju nastavu fizičkog vaspitanja i bave se drugim fizičkim aktivnostima (sportašice) i 100 učenica koji se ne bave nikakvim sportom izuzev redovne nastave fizičkog vaspitanja (nesportašice).

U istraživanju je primijenjeno 16 varijabli za procjenu bazičnih motoričkih sposobnosti koje dobro pokrivaju istraživani prostor.

Za utvrđivanje parcijalnih kvantitativnih razlika na univarijantnom nivou između ispitanica u motoričkim sposobnostima primjenjena je analiza rezultata T-testa za male nezavisne uzorke.

U cilju utvrđivanja razlika među ispitivanim grupama primjenjena je multivarijantna analiza varijanse (MANOVA) i univarijantna analiza varijanse (ANOVA).

Na osnovu dobivenih rezultata istraživanja može se konstatovati da su utvrđene statistički značajne parcijalne kvantitativne razlike između ispitanica u motoričkim sposobnostima, kao i razlike između ispitivanih grupa učenica.

**Ključne riječi:** učenice, razlike, varijable, sportašice, motorika

### ABSTRACT:

The main goal of this research is to determine the partial quantitative differences in the motor abilities of students aged 13 - 15 years, athletes and non-athletes. For the realization of this research, a sample of 170 students was treated, of which 70 regularly attend physical education classes and engage in other physical activities (athletes) and 100 students who do not engage in any sport except regular physical education classes (non-athletes).

In research we used 16 variables to assess basic motor skills that cover the study area well.

To determine the partial quantitative differences at the univariate level between the respondents in motor skills, analysis of T-test results for small independent samples was applied.

In order to determine the differences between the examined groups, multivariate analysis of variance (MANOVA) and univariate analysis of variance (ANOVA) was applied.

Based on the obtained results, it can be concluded that the partial statistically significant quantitative differences between respondents in motor skills, as well as differences between the groups of students.

**Keywords:** students, differences, variables, athletes, motor skills



## KANONIČKE RELACIJE ANTROPOMETRIJSKIH VARIJABLI I REZULTATA MLADIH ATLETIČARA-KI

Kada Delić-Selimović<sup>1</sup>, Jasmin Gavranović<sup>2</sup>

<sup>1</sup>Panevropski Univerzitet „Apeiron“, Bana Luka

<sup>2</sup>Nezavisni istraživač, Tuzla

### SAŽETAK

Kroz dugogodišnji rad u atletici došlo se do spoznaje da je ključni razlog za nedovoljno stvaranje vrhunskih rezultata u atletici, neadekvatan pristup primjeni naučnih metoda za procjenjivanje preddispozicija djece za bavljenje atletikom, odnosno nekom atletsom disciplinom. Jedan od ključnih razloga za nedovoljno efikasno rješavanje pitanja pravog načina i pravih metoda odabira, prije svega djevojčica i dječaka za bavljenje atletikom, i kasnijeg usmjeravanje na određenu takmčarsku disciplinu, bila je dugo vremena prisutna nepovezanost stručnog rada u atletsom klubovima i procesa naučno istraživačkog rada i obrazovanja. Ukoliko nema sprege naučno-istraživačkog rada i stručnog rada kao jednog multidisciplinarnog sistema nije moguće riješiti rano napuštanje bavljenja sportom i stvaranje vrhunskih atletsom rezultata. Zbog toga smo ovim radom pokušali napraviti interdisciplinarni pristup naučnostručničkim metodama i praktičnom iskustvu, te tako utvrditi kanoničke relacije antropometrijskih vrijednosti dječaka i djevojčica za stvaranje vrhunskih rezultata u atletsom disciplinama.

Predmet ovog istraživanja su korelacioni odnosi istraživanih antropoloških prostora kao uslov modeliranja jednačine specifikacije u procesima programiranja i selekcije za budući uspjeh u vrhunskoj atletici koja se zasniva na savremenoj trenažnoj tehnologiji koja obuhvata selekciju talenata na osnovu antropometrijskih vrijednosti. Istraživanjem je obuhvaćeno 200 dječaka i djevojčica koji su polaznici atletske škole u AK „Sloboda-Tehograd“ i koji imaju preddispozicije za različite atletske discipline.

**Ključne riječi:** atletika, talenti, vrhunski rezultati, stručni rad

## CANONICAL RELATIONS OF ANTHROPOMETRIC VARIABLES AND RESULTS OF YOUNG ATHLETES

### SUMMARY

Through many years of work in athletics, it has been realized that the key reason for insufficient creation of top results in athletics is inadequate approach to the application of scientific methods for assessing children's predispositions to engage in athletics, or some athletic discipline.

One of the key reasons for insufficiently efficient solution of the right way and the right methods of selection, primarily of girls and boys for athletics, and later focus on a certain competitive discipline, was the long-standing disconnection of professional work in athletic clubs and the process of scientific research. education. If there is no combination of scientific-research work and professional work as one multidisciplinary system, it is not possible to solve the early abandonment of sports and the creation of top athletic results.

Therefore, with this paper we tried to make an interdisciplinary approach to scientific research methods and practical experience, and thus determine the canonical relations of anthropometric values of boys and girls to create top results in athletic disciplines.

The subject of this research is the correlation relations of the researched anthropological spaces as a condition for modeling the equation of specification in the processes of programming and selection for future success in top athletics based on modern training technology that includes talent selection based on anthropometric values.

The research included 200 boys and girls who are students of the athletic school in AK „Sloboda-Tehograd“ and who have predispositions for various athletic disciplines.

**Key words:** athletics, talents, top results, professional work

## SPORTSKE AKTIVNOSTI IZ PERSPEKTIVE SREDNJOŠKOLACA U SRBIJI

Nedeljko M. Milanović<sup>1</sup>, Gordana Budimir-  
Ninković<sup>2</sup>, Nenad Stevanović<sup>3</sup>

<sup>1</sup>Fakultet pedagoških nauka, Univerzitet u Kragujevcu,  
Jagodina, Srbija

<sup>2</sup>Alfa BK Univerzitet, Beograd, Srbija

<sup>3</sup>Fakultet pedagoških nauka, Univerzitet u Kragujevcu,  
Jagodina, Srbija

### APSTRAKT:

Ovaj rad se bavi problemom nedostatka fizičkih aktivnosti kod srednjoškolaca koja može potencijalno imati negativne posledice. Cilj rada je ispitivanje stavova srednjoškolaca o tome koliko se bave fizičkim aktivnostima i sportom. U ispitivanju je primenjena deskriptivno-analitička metoda i tehnika anketiranja. Učestvovalo je ukupno 132 srednjoškolca iz centralnog dela Republike Srbije. Podaci dobijeni ovim istraživanjem ukazuju da se srednjoškolci najčešće ne bave sportom, ali da participacija u fizičkim i sportskim aktivnostima izaziva pozitivne i prijatne emocije kod njih. Srednjoškolci su istakli da se učestalost bavljenja sportom među mladima može učiniti aktivnijom kroz bolju opremljenost sportskih terena i iskoriscavanje površina za igrališta namenjena sportskoj rekreaciji, organizaciju humanitarnih sportskih turnira, kao i niže cene treninga u sportskim klubovima. Rezultati istraživanja navode na zaključak da bi se problem pasivnosti mogao rešiti većom promocijom sporta i sportskom aktivnošću.

**Ključne reči:** sport, mladi, srednjoškolci, zdravlje.

## SPORTS ACTIVITIES FROM THE PERSPECTIVE OF SECONDARY SCHOOL STUDENTS IN SERBIA

Nedeljko M. Milanović<sup>1</sup>, Gordana Budimir-  
Ninković<sup>2</sup>, Nenad Stevanović<sup>3</sup>

<sup>1</sup>Faculty of Education, University of Kragujevac,  
Jagodina, Serbia

<sup>2</sup>Alfa BK University, Beograd, Serbia

<sup>3</sup>Faculty of Education, University of Kragujevac,  
Jagodina, Serbia

### ABSTRACT:

This paper addresses the problem of lack of physical activity in high school students which can potentially have negative consequences. The aim of this paper is to examine the attitudes of high school students about how much they engage in physical activities and sports. The descriptive-analytical method and survey technique were applied in the examination. A total of 132 high school students from the central part of the Republic of Serbia participated. The data obtained by this research indicate that high school students usually do not play sports, but that participation in physical and sports activities causes positive and pleasant emotions in them. High school students pointed out that the frequency of playing sports among young people can be increased through more available sports fields and better use of playgrounds intended for sports recreation, organization of humanitarian sports tournaments, as well as lower training prices in sports clubs. The results of the research lead to the conclusion that the problem of lack of physical activity could be solved by greater promotion of sports and sports activity.

**Key words:** sports, youth, high school students, health.

## RAZLIKE U MOTORIČKIM SPOSOBNOSTIMA IZMEĐU UČENIKA I KARATISTA DOBI OD 10 DO 12 GODINA

Branimir Mikić<sup>1</sup>, Igor Paskoski<sup>2</sup>, Sedat Baftiu<sup>2</sup>

<sup>1</sup>Edukacijski fakultet Univerziteta u Travniku, Bosna i Hercegovina

<sup>2</sup>Nezavisni istraživač, Skoplje, Sjeverna Makedonija

## DIFFERENCES IN MOTOR SKILLS BETWEEN STUDENTS AND KARATISTS AGED 10 TO 12

Branimir Mikić<sup>1</sup>, Igor Paskoski<sup>2</sup>, Sedat Baftiu<sup>2</sup>

<sup>1</sup>Faculty of Education, University of Travnik, Bosnia and Herzegovina

<sup>2</sup>Independent researcher, Skopje, Northern Macedonia

### SAŽETAK

Istraživanje je provedeno na uzorku od 108 ispitanika od kojih 58 učenika koji su podvrgnuti redovnoj nastavi tjelesnog i zdravstvenog odgoja i 50 učenika koji su uključeni u karate školu. Osnovni cilj ovog istraživanja je utvrđivanje nivoa pojedinih motoričkih sposobnosti ispitanika, kao i razlika između navedenih uzoraka ispitanika u primjenjenim motoričkim sposobnostima nastalim pod dejstvom sadržaja nastave tjelesnog i zdravstvenog odgoja i trenažnog procesa u karate školi. Na osnovu rezultata kanoničke diskriminativne analize utvrđeno je da postoje statistički značajne globalne razlike između ispitivanih grupa i to u korist grupe karatista. Ovakvi rezultati nedvosmisleno ukazuju da su efekti trenažnog rada u karate školi pozitivno uticali na poboljšanje ispitivanih motoričkih sposobnosti ispitanika. **Ključne riječi:** učenici, karatisti, motoričke sposobnosti, razlike, diskriminativna naliza.

### ABSTRACT

The study was conducted on a sample of 108 respondents, of which 58 students were subjected to regular teaching physical and health education and 50 students involved in the karate school. The main objective of this study is to determine the level of individual motor abilities, as well as the differences between these samples in the applied motor dimensions occurred under the influence of the effects, course content tjelesnog and health education and training process in a karate school. Based on the results of canonical discriminant analysis showed a statistically significant global differences between the groups in favor of the group of karate. These results clearly indicate that the effects of training in the school karate positive effect on the improvement of the tested motor abilities.

**Keywords:** students, karate, motor skills, differences, additional analysis of discriminative.

## PROMJENE MOTORIČKIH SPOSOBNOSTI KARATISTA POD UTICAJEM MODELA TRENINGA

Rifet Mujanović<sup>1</sup>, Osmo Bajrić<sup>2</sup>, Rašid Hadžić<sup>3</sup>

<sup>1</sup>Državni Univerzitet u Novom Pazaru, Srbija

<sup>2</sup>Pan-evropski Univerzitet "Apeiron", Banja Luka, Bosna i Hercegovina

<sup>3</sup>Fakultet fizičkog vaspitanja i sporta, Nikšić, Crna Gora

### SAŽETAK

Istraživanje je izvršeno na uzorku od 104 ispitanika - studenta karatista Državnog univerziteta u Novom Pazaru, uzrasta od 19 do 22 godine. Celokupni uzorak ispitanika podjeljen je na dva subuzorka. Prvi subuzorak činilo je 40 ispitanika - studenata karatista definisani kao eksperimentalna grupa sa kojom je realizovan eksperimentalni model treninga. Drugi subuzorak činilo je 64 ispitanika - studenta karatista koji su predstavljali kontrolnu grupu i koja nije bila obuhvaćena eksperimentalnim programom treninga. U istraživanju je primenjeno 12 varijabli za procenu motoričkih sposobnosti. Osnovni cilj istraživanja bio je utvrđivanje efekata eksperimentalnog modela treninga na promene motoričkih sposobnosti kod ispitanika eksperimentalne grupe. Za utvrđivanje kvantitativnih promena (razlika) između inicijalnog i finalnog merenja primenjena je analiza rezultata T-testa. Za utvrđivanje razlika između grupa ispitanika (eksperimentalne i kontrolne) primenjena je multivarijantna (MANOVA) i univarijantna (ANOVA) analiza varijanse. Rezultati analize T-testa su pokazali da je došlo do statistički značajnih promena motoričkih sposobnosti na finalnom u odnosu na inicijalno merenje pod uticajem primenjenog eksperimentalnog modela treninga u trajanju od 3 meseca sa 36 trenažnih jedinica. Analiza multivarijantne analize varijanse (MANOVA) je pokazala da se grupe međusobno statistički značajno razlikuju u motoričkim sposobnostima u korist ispitanika eksperimentalne grupe.

**Ključne riječi:** karatisti, eksperimentalni model treninga, motoričke sposobnosti, analiza varijanse, diskriminativna analiza i analiza kovarijanse.

## CHANGES IN THE MOTOR ABILITIES OF KARATISTS UNDER THE INFLUENCE OF THE TRAINING MODEL

Rifet Mujanović<sup>1</sup>, Osmo Bajrić<sup>2</sup>, Rašid Hadžić<sup>3</sup>

<sup>1</sup>State University of Novi Pazar, Serbia

<sup>2</sup>Pan-European University "Apeiron", Banja Luka, Bosnia and Herzegovina

<sup>3</sup>Faculty of Physical Education and Sports, Nikšić, Montenegro

### SUMMARY

The research was performed on a sample of 104 respondents - karate students of the State University in Novi Pazar, aged 19 to 22 years. The entire sample of respondents was divided into two subsamples. The first subsample consisted of 40 respondents - karate students defined as an experimental group with which the experimental training model was realized. The second subsample consisted of 64 respondents - karate students who represented the control group and which was not included in the experimental training program. The study used 12 variables to assess motor abilities. The main goal of the study was to determine the effects of the experimental training model on changes in motor abilities in the subjects of the experimental group. To determine the quantitative changes (differences) between the initial and final measurements, the analysis of T-test results was applied. Multivariate (MANOVA) and univariate (ANOVA) analysis of variance was used to determine the differences between groups of subjects (experimental and control). The results of the T-test analysis showed that there were statistically significant changes in motor abilities at the final compared to the initial measurement under the influence of the applied experimental training model for 3 months with 36 training units. Multivariate analysis of variance (MANOVA) analysis showed that the groups differed statistically significantly in motor abilities in favor of the subjects of the experimental group.

**Key words:** karate, experimental training model, motor abilities, analysis of variance, discriminant analysis and covariance analysis.

## ANALIZA TELESNOG SASTAVA DECE MLAĐEG ŠKOLSKOG UZRASTA

<sup>1</sup>Nebojša Mitrović, <sup>2</sup>Slavko Dragosavljević,  
<sup>3</sup>Slobodan Pavlović, <sup>4</sup>Dajana Gluvić

<sup>1</sup>Univerzitet u Istočnom Sarajevu, Pedagoški fakultet,  
docent;

<sup>2</sup>Univerzitet u Istočnom Sarajevu, Fakultet fizičkog  
vaspitanja i sporta, docent;

<sup>3</sup>Univerzitet u Kragujevcu Pedagoški fakultet Užice,  
docent;

<sup>4</sup>Republički Pedagoški zavod Republike Srpske, magistar  
razredne nastave;

## ANALYSIS OF BODY COMPOSITION OF CHILDREN OF YOUNGER SCHOOL AGE

<sup>1</sup>Nebojša Mitrović, <sup>2</sup>Slavko Dragosavljević,  
<sup>3</sup>Slobodan Pavlović, <sup>4</sup>Dajana Gluvić

<sup>1</sup>University of East Sarajevo, Faculty of Education,  
Assistant Professor;

<sup>2</sup>University of East Sarajevo, Faculty of Physical  
Education and Sports, Assistant Professor;

<sup>3</sup>University of Kragujevac, Faculty of Pedagogy, Uzice;

<sup>4</sup>Republic Pedagogical Institute of Republika Srpska,  
master of primary education;

### SAŽETAK

Gojaznost je postala glavni zdravstveni problem, povezan sa izobiljem hrane sa visokim udelom masti i brzom promenom sa aktivnog u sedentarni način života. Efekti gojaznosti na decu imaju ogroman uticaj i mogu se kretati od niskog samopoštovanja do povećanog rizika od kardiovaskularnih bolesti. Najefikasniji lek za dečju gojaznost je prevencija. U Bijeljini je sprovedeno transversalno istraživanje na uzorku od 173 (85 dečaka i 88 devojčica) ispitanika koja su u trenutku testiranja imala 10 godina (+/- 6 meseci). Procena telesnog sastava utvrđena je pomoću bioelektričnog analizatora Tanita TBF 300, a podaci su statistički obrađeni u programskom paketu SPSS 21. Rezultati istraživanja pokazuju da devojčice imaju značajno lošiji odnos telesnog sastava u odnosu na dečake u analiziranom uzorku ispitanika. Statistički značajne razlike uočene su u varijabli Procenat masti u telu, Težina masti u telu, Procenat vode u telu, Bazalni metabolizam.

**Cljučne reči:** Telesni sastav, deca, mlađi školski uzrast.

### SUMMARY

Obesity has become a major health problem, associated with an abundance of high-fat foods and a rapid change from an active to a sedentary lifestyle. The effects of obesity on children have a huge impact and can range from low self-esteem to an increased risk of cardiovascular disease. The most effective remedy for childhood obesity is prevention. In Bijeljina, a transversal study was conducted on a sample of 173 (85 boys and 88 girls) respondents who were 10 years old (+/- 6 months) at the time of testing. Assessment of body composition was determined using a bioelectric analyzer Tanita TBF 300, and the data were statistically processed in the software package SPSS 21. The results of the research show that girls have a significantly worse body composition ratio compared to boys in the analyzed sample. Statistically significant differences were observed in the variable Body Fat Percentage, Body Fat Weight, Body Water Percentage, Basal Metabolism.

**Key words:** Body composition, children, younger school age.

## РАЗЛИКЕ У МОТОРИЧКИМ СПОСОБНОСТИМА ДЕЦЕ СА ПОСТУРАЛНИМ ПОРЕМЕЋАЈИМА И ДЕЦЕ СА ПОСЕБНИМ ПОТРБАМА

Нино Манојловић<sup>1</sup>, Србољуб Вуковић<sup>2</sup>, Милан Анђелић<sup>3</sup>, Лазар Пајовић<sup>4</sup>

<sup>1</sup>Српски савез за рекреативни спорт особа са инвалидитетом,

<sup>2</sup>Факултет спортских наука Апеирон,

<sup>3</sup>Кошаркашки клуб Будућност Подгорица,

<sup>4</sup>Фудбалски клуб Нови Пазар Србија

## DIFFERENCES IN MOTOR SKILLS OF CHILDREN WITH POSTURAL DISORDERS AND CHILDREN WITH SPECIAL NEEDS

Nino Manojlović<sup>1</sup>, Srboљub Vuković<sup>2</sup>, Milan Anđelić<sup>3</sup>, Lazar Pajović<sup>4</sup>

<sup>1</sup> Serbian Association for Recreational Sports for Persons with Disabilities,

<sup>2</sup> Faculty of Sports Sciences Apeiron,

<sup>3</sup> Basketball Club Budućnost Podgorica,

<sup>4</sup> Football Club Novi Pazar Serbia

### САЖЕТАК

У области спорта и спортске рекреације особа са сметњама у развоју (инвалидитетом) недовољно спортски радници баве истраживањима у тој области. Област везана за особе са било којом врстом ометеношћу, да ли је у питању интелектуална или физичка није довољно заступљена у друштву, нарочито у спортским круговима, а заправо је једно огромно неистражено поље.

Тестирање испитаника је извршено на редовном тренингу. Испитаницима је објашњена сврха тестирања и о томе су били обавештени и родитељи испитаника (код особа са сметњама у развоју је објашњено родитељима и добијена је њихова сагласност). Циљ рада је да се покаже да постоје значајне статистичке разлике у моторичким способностима деце са постуралним поремећајима и деце са посебним потребама.

Узорак испитаника чинила су деца са интелектуалним сметњама у развоју и менталном неразвијеношћу (аутизам, даунов синдром, повећана хиперактивност, лака ментална ретардација...). Укупно њих двадесет, узраста од 10 до 20 година и деца са различитим поремећајима постуралног статуса (поремећај постуралног статуса грудног дела кичменог стуба и поремећај постуралног статуса свода стопала) такође њих двадесет узраста тринаест година.

Узорак мерних инструмената чинили су типични тестови за процену моторичких способности, односно коригована верзија ЕУРОФИТ батерије тестова, прилагођена узорку ентитета и њиховим могућностима.

**Кључне речи:** моторичке способности, деца са посебним потребама, постурални поремећај

### SUMMARY

In the field of sports and sports recreation of persons with disabilities, insufficient sports workers are engaged in research in this area. The field related to people with any kind of disability, whether it is intellectual or physical, is not sufficiently represented in society, especially in sports circles, and in fact it is a huge unexplored field.

Testing of the respondents was performed at regular training. The purpose of testing was explained to the respondents and the parents of the respondents were also informed about it (in the case of persons with developmental disabilities, the parents were explained and their consent was obtained).

The aim of this paper is to show that there are significant statistical differences in the motor abilities of children with postural disorders and children with special needs.

The sample consisted of children with intellectual disabilities and mental retardation (autism, Down syndrome, increased hyperactivity, mild mental retardation ...). A total of twenty of them, aged 10 to 20, and children with various postural status disorders (postural status disorder of the thoracic spine and postural status disorder of the arch of the foot) are also twenty-thirteen years old.

The sample of measuring instruments consisted of typical tests for the assessment of motor abilities, ie a corrected version of the EUROFIT battery of tests, adapted to the sample of entities and their capabilities.

**Key words:** motor skills, children with special needs, postural disorder



## EFEKTI MODELA VEŽBANJA SA INTERVALNIM SMENJIVANJEM AEROBNOG I ANAEROBNOG REŽIMA RADA NA REDUKCIJU POTKOŽNOG MASNOG TKIVA

Nino Manojlović<sup>1</sup>, Vladimir Miletić<sup>2</sup>, Milan Anđelić<sup>3</sup>, Srboljub Vuković<sup>4</sup>

<sup>1</sup>Srpski savez za rekreativni sport osoba sa invaliditetom,

<sup>2</sup>Sportski centar Cezarus Beograd,

<sup>3</sup>Košarkaški klub Budućnost Podgorica,

<sup>4</sup>Fakultet sportskih nauke Apeiro

## EFFECTS OF EXERCISE MODELS WITH INTERVAL SHIFTING OF AEROBIC AND ANAEROBIC REGIME OF WORK ON REDUCTION OF SUBCUTANEOUS AIDS

Nino Manojlovic<sup>1</sup>, Vladimir Miletic<sup>2</sup>, Milan Andjelic<sup>3</sup>, Srboljub Vukovic<sup>4</sup>

<sup>1</sup>Serbian Association for Recreational Sports of Persons with Disabilities,

<sup>2</sup>Cesarski centar Cezarus Belgrade,

<sup>3</sup>Basketball Club Budućnost Podgorica,

<sup>4</sup>Faculty of Sports Sciences Apeiro

### SAŽETAK

Istraživanje je odrađeno sa namerom da se utvrdi kakav efekat sastavljeni program vežbi ima na redukciju potkožnog masnog tkiva kod studentkinja. Za utvrđivanje efekata korišćeni su podaci inicijalnog i finalnog merenja kožnog nabora trbuha, kožnog nabora tricepsa i subskapularnog kožnog nabora. Podaci su obrađeni primenom zavisnog t-testa. Rezultati istraživanja pokazali su postojanje statističke značajnosti razlika između inicijalnog i finalnog merenja, što znači da je ovaj model vežbanja uticao na smanjenje potkožnog masnog tkiva obrađenih antropoloških regiona. Istraživanje je pokazalo da studentkinje mogu vežbati u teretani, i na taj način zadovoljavati svoje potrebe za fizičkom aktivnošću. S obzirom da je t-test za dve zavisne grupe ispitanika dao pozitivnu statističku značajnost, zaključeno je da model vežbanja sa intervalnim smenjivanjem aerobnog i anaerobnog režima rada, svrsishodan za primenu programa redukcije potkožnog masnog tkiva.

**Ključne reči:** potkožno masno tkivo, studentkinje, efekat vežbanja, inicijalno merenje, finalno merenje.

### SUMMARY

The research was done with the intention to determine what effect the compiled exercise program has on the reduction of subcutaneous adipose tissue in female students. Data from the initial and final measurements of the skin fold of the abdomen, the skin fold of the triceps, and the subscapular skin fold were used to determine the effects. Data were processed using a dependent t-test. The results of the research showed the existence of statistical significance of the differences between the initial and final measurement, which means that this model of exercise influenced the reduction of subcutaneous adipose tissue of the treated anthropological regions. Research has shown that female students can exercise in the gym, and thus meet their needs for physical activity. Considering that the t-test for two dependent groups of subjects gave positive statistical significance, it was concluded that the exercise model with interval shifting of aerobic and anaerobic mode of operation, is expedient for the application of subcutaneous adipose tissue reduction programs.

**Key words:** subcutaneous adipose tissue, female students, exercise effect, initial measurement, final measurement.

## FIZIOLOŠKO OPTEREĆENJE UČENIKA USLOVLJENO STRUKTUROM SATA TJELESNOG I ZDRAVSTVENOG ODGOJA

Adi Mujičić<sup>1</sup>, Jasmin Imamović<sup>2</sup>, Jasmin Bilalić<sup>3</sup>, Osmo Bajrić<sup>4</sup>

<sup>1</sup> Srednja mješovita škola Žepče, Žepče, Bosna i Hercegovina

<sup>2</sup> Nezavisni istraživač, Tuzla, Bosna i Hercegovina

<sup>3</sup> Fakultet za tjelesni odgoj i sport, Univerzitet u Tuzli, Bosna i Hercegovina

<sup>4</sup> Fakultet sporta, Univerzitet u Travniku, Bosna i Hercegovina

### SAŽETAK

Uzorak u ovom istraživanju predstavljaju selekcionisani učenici sa prosječnim karakteristikama i sposobnostima koji oslikavaju realnu sliku razreda. Istraživanjem je obuhvaćeno 5 učenika VIII razreda osnovne škole, muškog spola. Praćena je frekvencija srčanog ritma istih učenika tokom dva sata tjelesnog i zdravstvenog odgoja, sa istom nastavnom jedinicom, istim kineziološkim operatorima, ali sa dodatkom štafetne igre tokom glavnog dijela sata u tzv. petodjelnoj strukturi. Za procjenu pojedinačnog i ukupnog fiziološkog opterećenja praćena je i izračunata srčana frekvencija te utvrđene razlike u srčanoj frekvenciji. Cilj istraživanja je da se definišu i utvrde razlike u fiziološkom opterećenju učenika tokom četverodjelne i petodjelne strukture sata tjelesnog i zdravstvenog odgoja.

**Ključne riječi:** Učenici, fiziološko opterećenje, struktura sata tjelesnog i zdravstvenog odgoja

## PHYSIOLOGICAL LOAD OF STUDENTS DETERMINED BY THE STRUCTURE OF THE HOUR OF PHYSICAL AND HEALTH EDUCATION

### SUMMARY

The sample in this research is represented by selected students with average characteristics and abilities that depict a realistic picture of the class. The research included 5 male students of the 8th grade of primary school. The heart rate of the same students was monitored during two hours of physical and health education, with the same teaching unit, the same kinesiological operators, but with the addition of a relay game during the main part of the hour in the so-called five-part structure. To assess individual and total physiological load, heart rate was monitored and calculated, and differences in heart rate were determined. The aim of the research is to define and determine the differences in the physiological load of students during the four-part and five-part structure of physical education and health education classes.

**Key words:** Students, physiological load, structure of class of physical and health education



## RAZLIKE U NEKIM ANTROPOLOŠKIM DIMENZIJAMA UČENICA SPORTISTA I NESPORTISTA U ODNOSU NA HRONOLOŠKU DOB

Adi Mujičić<sup>1</sup>, Vlatko Šeparović<sup>2</sup>, Melika Muratović<sup>2</sup>

<sup>1</sup> Srednja mješovita škola Žepče, Žepče, Bosna i Hercegovina

<sup>2</sup> Fakultet za tjelesni odgoj i sport, Univerzitet u Tuzli, Bosna i Hercegovina

### SAŽETAK

Ovo istraživanje sa vremenskog aspekta ima transferzalni karakter, sa ciljem da se utvrde razlike u nekim antropološkim dimenzijama učenica sportista i nesportista različite hronološke dobi. Uzorak ispitanika činilo je 240 djevojčica sa su-buzorkom od 11, 13 i 16 godina starosti s područja Zeničko-dobojskog kantona sa 120 učenica koje se bave sportom i 120 učenica koje se ne bave nijednim sportom. Podjela uzorka izvršena je putem ankete, sa tačno utvrđenim kriterijima za odabir sportista i nesportista. Istraživani pros-tori u okviru antropoloških dimenzija sadržani su u 13 varijabli od čega su: morfološke karakteristike (4 varijable), bazično-motoričke sposobnosti (7 varijabli) i situaciono-motoričke sposobnosti (2 varijable).

**Cljučne riječi:** Učenice, antropološke dimenzije, sportisti, nesportisti.

## DIFFERENCES IN SOME ANTHROPOLOGICAL DIMENSIONS OF STUDENTS ATHLETES AND NON- ATHLETES IN RELATION TO CHRONOLOGICAL AGE

### SUMMARY

This research has a transversal character from the time aspect, with the aim of determining the differences in some anthropological dimensions of female athletes and non-athletes of different chronological ages. The sample consisted of 240 girls with a subsample of 11, 13 and 16 years of age from the area of Zenica-Doboj Canton with 120 students who do sports and 120 students who do not do any sports. The division of the sample was done through a survey, with precisely determined criteria for the selection of athletes and non-athletes. The investigated spaces within the anthropological dimensions are contained in 13 variables, of which: morphological characteristics (4 variables), basic-motor abilities (7 variables) and situational-motor abilities (2 variables).

**Key words:** Students, anthropological dimensions, athletes, non-athletes.

## POVEZANOST TELESNE KOMPOZICIJE SA EKSPLOZIVNOM SNAGOM SELEKCIONISANIH DŽUDISTA

Nikola Milošević<sup>1</sup>, Nemanja Stanković<sup>1</sup>, Saša Pantelić<sup>1</sup>, Miodrag Spasić<sup>2</sup>

<sup>1</sup>Fakultet sporta i fizičkog vaspitanja, Univerzitet u Nišu, Srbija

<sup>2</sup>Kineziološki fakultet, Sveučilište u Splitu, Hrvatska

## CORRELATION OF BODY COMPOSITION WITH EXPLOSIVE STRENGTH OF SELECTED JUDOKA

Nikola Milošević<sup>1</sup>, Nemanja Stanković<sup>1</sup>, Saša Pantelić<sup>1</sup>, Miodrag Spasić<sup>2</sup>

<sup>1</sup>Faculty of Sport and Physical Education, University of Nis, Serbia

<sup>2</sup>Faculty of Kinesiology, University of Split, Croatia

### SAŽETAK

Cilj ovog istraživanja je da se utvrdi povezanost telesne kompozicije sa eksplozivnom snagom selekcionisanih džudista. Studija je sprovedena na uzorku od 25 džudista kadetskog i juniorskog uzrasta, članova muške reprezentacije Srbije. Za analizu telesnog sastava korišćen je aparat In Body 720 i kaliper. Za merenje parametara eksplozivne snage koristio se "Optojump" i Fitrodine Premium. Osnovni parametri deskriptivne statistike izračunati su za svaku varijablu. Kanonička korelaciona analiza primenjena za utvrđivanje povezanosti testova telesne kompozicije sa grupom testova eksplozivne snage. Rezultati istraživanja pokazali su da relacija telesne kompozicije i parametara eksplozivne snage ima statistički značajan jedan faktor koji ima visoku kanoničku korelaciju .97 (Canonical R .97), koja je objašnjena sa 94% od ukupnog varijabiliteta (Canonical R<sup>2</sup> .94) i statistički je značajna na nivou  $p < .05$ .

**Cljučne reči:** telesna kompozicija, eksplozivna snaga, džudo

### ABSTRACT

This research aimed to determine the relationship between body composition and explosive strength of selected judokas. The study was carried out on a sample of 25 judokas of the cadet and junior categories, members of the men's national team of Serbia. To analyze body composition the In Body 720 device was used, along with a caliper. To measure the parameters of strength, the Optojump and Fitrodine Premium were used. The basic parameters of descriptive statistics were calculated for each of the variables. The canonical correlation analysis was calculated to determine the correlation between the body composition and tests of explosive strength. The research results have indicated that the relation between body composition and the parameters of explosive strength has one statistically significant factor with a high canonical correlation of .97 (Canonical R .97), which is explained with 94% of the overall variability (Canonical R<sup>2</sup> .94) and is statistically significant at the  $p < .05$  level.

**Keywords:** body composition, explosive strength, judo

## UTICAJ ZIMSKOG RASPUSTA NA RAZVOJ FIZIČKIH AKTIVNOSTI UČENIKA U OSNOVNOJ ŠKOLI KOJI POHAĐAJU KOŠARKAŠKU SEKCIJU

Milan Anđelić<sup>1</sup>, Srboljub Vuković<sup>2</sup>, Milomir  
Trivun<sup>3</sup>, Dejan Čeremidžić<sup>3</sup>

<sup>1</sup>Košarkaški klub *Budućnost Podgorica*,

<sup>2</sup>Fakultet sportskih nauka *Apeiron*,

<sup>3</sup>Fakultet fizičkog vaspitanja i sporta *Istočno Sarajevo*

## THE INFLUENCE OF WINTER HOLIDAYS ON THE DEVELOPMENT OF PHYSICAL ACTIVITIES OF PRIMARY SCHOOL STUDENTS ATTENDING THE BASKETBALL SECTION

Milan Andjelic<sup>1</sup>, Srboljub Vukovic<sup>2</sup>, Milomir  
Trivun<sup>3</sup>, Dejan Ceremidzic<sup>3</sup>

<sup>1</sup>Basketball Club *Budućnost Podgorica*,

<sup>2</sup>Faculty of Sports Sciences *Apeiron*,

<sup>3</sup>Faculty of Physical Education and Sports *East Sarajevo*

### SAŽETAK

Istraživanje je imalo za cilj da utvrdi uticaj zimskog raspusta na razvoj fizičkih aktivnosti učenika osnovne škole. Uzorak od 40 učenika izvučen je iz populacije učenika uzrasta 12 – 14 godina ( $\pm 6$  mjeseci), muškog pola koji su pored nastave fizičkog vaspitanja pohađali košarkašku sekciju koja se održavala tri puta nedeljno. Izmjerenj je šest testova za procjenu motoričkih sposobnosti: osmica sa saginjanjem, koraci u stranu, skok udalj iz mjesta skok uvis iz mjesta, taping rukom i trčanje na 20 metara iz visokog starta. Upotrebom deskriptivne statistike i komparativne analize odnosno t- testa došlo se do rezultata koji nam govore da postoji značajna rezlika u nivou koordinacije učenika poslije zimskog raspusta.

**Ključne riječi:** dodatna nastava fizičkog vaspitanja, košarka, motoričke sposobnosti, koordinacija, učenici osnovnih škola

### ABSTRACT

The research aimed to determine the impact of winter vacation on the development of physical activities of primary school students. A sample of 40 students was drawn from the population of students aged 12-14 years ( $\pm 6$  months), males who, in addition to physical education classes, attended the basketball section, which was held three times a week. Six tests were assessed to assess motor skills: eight with bending, steps to the side, long jump from a place, high jump from a place, hand tapping and running at 20 meters from a high start. Using descriptive statistics and comparative analysis, ie t-test, we obtained results that tell us that there is a significant difference in the level of coordination of students after the winter break.

**Keywords:** additional physical education classes, basketball, motor skills, coordination, primary school students

## EFEKTI TRENINGA NA RAZVOJ AGILNOSTI KOŠARKAŠA

Srboljub Vuković<sup>1</sup>, Milan Anđelić<sup>2</sup>, Dejan Ćeremidžić<sup>3</sup>, Nino Manojlović<sup>4</sup>

<sup>1</sup>Fakultet sportskih nauka Apeiron

<sup>2</sup>Košarkaški klub Budućnost Podgorica,

<sup>3</sup>Fakultet fizičkog vaspitanja i sporta Istočno Sarajevo,

<sup>4</sup>Srpski savez za rekreativni sport osoba sa invaliditetom

### APSTRAKT

Košarka je jedan od najpopularnijih sportova na svetskom nivou. Privlačnost košarke se, prije svega, bazira na veoma izraženoj dinamici igre, promjenjivosti i nepredvidljivosti situacija u igri. U današnjoj košarci se od igrača zahtjeva posjedovanje određenih bazičnih motoričkih sposobnosti. Jedna od motoričkih sposobnosti koja je jako bitna za košarku je agilnost. Agilnost, kao sposobnost precizne i brze promjene pozicije tijela u prostoru bez gubitka ravnoteže, se često posmatra kao aspekt koordinacije i veoma je značajna u košarci jer je košarka igra u kojoj ima veliki broj eksplozivnih, brzih kretanja sa promjenama pravca, smjera i ritma kretanja. Cilj ovoga rada je bio da se prikupe dosadašnja istraživanja koja su se bavila razvojem agilnosti košarkaša. Za prikupljanje i analizu ciljanih istraživanja korišćena je deskriptivna metoda i teorijska analiza, a istraživanja do kojih se došlo pretraživana su na Google Scholar, PubMed, Kobson, Scopus i SCI. Pretraga je ograničena na radove koji su objavljeni u periodu od 2006. do 2018. godine. Ukupno je pronađeno 10 istraživanja. Rezultati istraživanja su pokazali da se za razvoj agilnosti najčešće koristi pliometrijska metoda treninga. Takođe nekoliko istraživanja je pokazalo da se agilnost može razviti i kombinacijom pliometrijskog treninga sa nekim drugim treningom. Osim pliometrijskog treninga za razvoj agilnosti sve više se koristi proprioceptivni trening i SAQ trening (kombinacija treninga snage, izdržljivosti i košarkaške tehnike). Bez obzira da li je poseban trening ili dio treninga veoma je važno da treningu ovih sposobnosti prethodi dobra priprema organizma, prije svega, zagrijavanje i priprema zglobno-tetivnog i mišićnog aparata, pošto su vježbe agilnosti obično maksimalnog ili submaksimalnog inteziteta opterećenja.

**Ključne riječi:** motoričke sposobnosti, košarka, agilnost

## EFFECTS OF TRAINING ON THE DEVELOPMENT OF BASKETBALL PLAYERS 'AGILITY

Srboljub Vukovic<sup>1</sup>, Milan Andjelic<sup>2</sup>, Dejan Ceremidzic<sup>3</sup>, Nino Manojlovic<sup>4</sup>

<sup>1</sup>Faculty of Sports Sciences Apeiron

<sup>2</sup>Basketball Club Budućnost Podgorica,

<sup>3</sup>Faculty of Physical Education and Sports East Sarajevo,

<sup>4</sup>Serbian Association for Recreational Sports of Persons with Disabilities

### ABSTRACT

Basketball is one of the most popular sports in the world. The appeal of basketball is, above all, based on the very pronounced dynamics of the game, the variability and unpredictability of situations in the game. In today's basketball, players are required to possess certain basic motor skills. One of the motor skills that is very important for basketball is agility. Agility, as the ability to accurately and quickly change body position in space without losing balance, is often seen as an aspect of coordination and is very important in basketball because basketball is a game in which there is a large number of explosive, fast movements with changes in direction, direction and rhythm. The aim of this paper was to collect previous research that dealt with the development of basketball agility. A descriptive method and theoretical analysis were used to collect and analyze the targeted research, and the research obtained was searched on Google Scholar, PubMed, Kobson, Scopus and SCI. The search is limited to papers published in the period from 2006 to 2018. A total of 10 studies were found. The results of the research showed that the plyometric training method is most often used for the development of agility. Also, several studies have shown that agility can be developed by combining plyometric training with some other training. In addition to plyometric training, proprioceptive training and SAQ training (a combination of strength training, endurance and basketball techniques) are increasingly used to develop agility. Regardless of whether it is a special training or a part of training, it is very important that the training of these abilities is preceded by good preparation of the organism, first of all, warming up and preparation of the articular and tendon and muscular apparatus.

**Keywords:** motor skills, basketball, agility

## UTJECAJ MEĐUSEZONSKE PAUZE NA REZULTATE SPRINTERSKIH DISCIPLINA SLOBODNIM NAČINOM PLIVANJA KOD MLAĐIH DOBNIH KATEGORIJA

Matej Miličić, Goran Gabrilo, Zrinka Smoje

*Kineziološki fakultet u Splitu, Teslina 6, Split, Hrvatska*

### SAŽETAK

Osnovni cilj ovog rada je utvrditi kakav je utjecaj međusezonske pauze na sprinterske discipline plivane slobodnim načinom plivanja kod mlađih natjecatelja, a s obzirom na aktivitet tijekom pauze. U istraživanju je sudjelovalo 12 ispitanika, (prosječne dobi 15,33;  $\pm$  2,39), svi dobro trenirani plivači s višegodišnjim iskustvom u natjecateljskom plivanju. Na kraju natjecateljske sezone (inicijalno mjerenje), te dva tjedna kasnije, početkom iduće (finalno mjerenje), ispitanici su testirani u disciplinama 50 i 100 metara slobodno. Ispitanici su podijeljeni u dvije grupe: NEAKTIVNI (N = 7) – nisu trenirali tijekom pauze; AKTIVNI (N = 5) – trenirali na suhom tijekom pauze. Razlike između inicijalnog i finalnog mjerenja za svaku grupu dobivene su t-testom za zavisne uzorke, dok su razlike među grupama utvrđene t-testom za nezavisne uzorke. Razlike među grupama i mjerenjima, utvrđeno je analizom varijance za ponovljena mjerenja. Rezultati ukazuju da ne postoje razlike među grupama u opadanju rezultata, ali isto tako da rezultati opadaju u prosjeku od 2 do 2,5% nakon pauze, bez obzira na grupu. Za bolje razumijevanje ove problematike, potrebno je uključiti veći broj ispitanika, te produžiti period kroz koji se promatra pojava detreninga.

**Ključne riječi:** detrening, sport, adolescenti

### ABSTRACT

The main objective of this study is to determine effects of offseason break on sprint disciplines in freestyle swimming and whether activity during break will influence the sprinting ability. The sample comprised 12 swimmers (mean age 15,22  $\pm$  2,39 years), all well trained swimmers with perennial swimming experience. The variables included the 50 and 100 meter freestyle swimming test, at the end of the swimming season (initial measurement) and at the beginning of the next season (final measurement). The offseason break lasted 2 weeks. Subjects were divided in 2 groups: ACTIVE (N=5) – dryland training during offseason; INACTIVE (N=7) – no organized training during offseason break. Dependent samples t-test was calculated for differences between measurements, independent samples t-test for differences between groups and repeated measures ANOVA for measurements/groups differences. Results indicate there is a decreasing in sprinting performance after 2-week break, regardless of the group. Results decrease after offseason break from 2% to 2,5% in average. For better understanding of the offseason break, it is necessary to increase the number of subjects, as well as the analyzed period to understand detraining better.

**Keywords:** swimming, detraining, activity, swimmers

## MJEŠOVITI DUET U UMJETNIČKOM PLIVANJU, NOVA NATEJCATELJSKA DISCIPLINA

Mia Perić, Matko Lulić, Ivan Jurić

*Kineziološki fakultet, Sveučilište u Splitu, Hrvatska*

### SAŽETAK

Od prvog SP 1973. umjetničko (sinkornizirano) plivanje smatralo se isključivo ženskim sportom. Iako su se muškarci pojavljivali u umjetničkom plivanju na nižim razinama natjecanja, tek 2015. FINA uvodi disciplinu u kojoj se natječu i muškarci, mješoviti duet. U toj službeno novoj disciplini, istovremeno nastupaju jedna žena i jedan muškarac. Međutim, koreografski se ipak razlikuju od standardnog ženskog dueta. Osim sinkronizacije i zrcalnih kretnji, mix-duo pokušava naglasiti muževnost i snagu tako da muškarac povremeno preuzima na sebe težinu partnerice te je podiže, baca ili podupire u zajedničkim elementima. Jedna je od rijetkih sportskih disciplina u kojoj muškarci i žene zajedno nastupaju i natječu se. Uvođenjem ovakvih disciplina na OI, zapravo bi se dao vjetar u leđa razvoju spolne raznolikosti po sportovima, razvoju spolno mješovitih disciplina, a u konačnici uključivanju većeg broja dječaka i muškaraca u estetske sportove i one koji nisu dominantno muški.

**Ključne riječi:** estetski sport, uključivanje muškaraca, sinkronizirano plivanje

## ARTISTIC SWIMMING MIXED DUET, NEW COMPETITION DISCIPLINE

### ABSTRACT

Since the first World Championships in 1973, artistic (synchronized) swimming has been considered an exclusively female sport. Although men have competed in artistic swimming at lower levels of competition, just in 2015 FINA introduced a discipline in which men can also compete, a mixed duet. In this officially new discipline, one woman and one man perform at the same time. However, those routines are choreographically different from the standard female duet. In addition to synchronization and mirror movements, the mixed-duet tries to emphasize masculinity and strength so that a man occasionally takes on his partner's weight and lifts, throws or supports her in common elements. It is one of the few sports in which men and women perform and compete together. By introducing such disciplines at the Olympics, it would actually give a wind in to the sails of the development of gender diversity in sports, the development of gender-mixed disciplines and ultimately, the inclusion of more boys and men in aesthetic and non dominantly male sports.

**Keywords:** aesthetic sport, male inclusion, synchronized swimming



## INKLUZIVNI SPORTOVI KAO STRATEŠKO OPREDJELJENJE SPECIJALNE OLIMPIJADE ZA PERIOD 2021-2024

Kada Delić-Selimović<sup>1</sup>, Jasmin Gavranović<sup>2</sup>

<sup>1</sup>Panevropski Univerzitet «Apeiron», Banja Luka

### SAŽETAK

Problemi inkluzije u predškolskim ustanovama odnose se i na neprilagođenost djece sa posebnim potrebama ostaloj djeci (5.1%), na predrasude roditelja djece bez razvojnih problema (5.1%) kao i na nespremnost za saradnju roditelja djece sa posebnim potrebama. Prema mišljenju ispitanih, nisu samo «zdrava» djeca nepripremljena za inkluziju već i ona sa posebnim potrebama. Drugim riječima, ni jednoj ni drugoj grupi djece nije lahko kada zajedno provode svakodnevno značajan vremenski period. Ali nisu samo dječije reakcije problematične. Situaciju komplikuju i roditelji! Mišljenja su da će im djeca biti zapostavljena, ugrožena, ostavljena «po strani». Usljed toga, jedni postupaju u svjetlu predrasuda prema osobama sa posebnim potrebama, a drugi su neiskreni pa kriju dijagnozu djeteta ili prešute da je dijete pod kontinuiranom medikamentoznom terapijom.

Općenito je moguće zaključiti kako se integracijom ne ostvaruje glavni cilj zbog kojeg se pristupilo njezinu provođenju, a to je stjecanje povoljnijeg socijalnog i emocionalnog iskustva djece s teškoćama u razvoju, koje će im omogućiti kasnije uspješno uključivanje u društveni i profesionalni život u svijetu većine. Jednostavno, ni jedni ni drugi u današnjoj školi ne stječu takvo iskustvo, pa integracija za mnoge od njih postaje još jednim faktorom koji uzrokuje odvajanje, izoliranje jednih od drugih i međusobno nerazumijevanje. Učenicima s teškoćama u razvoju često ne uspijevaju uspostaviti dobre socijalne kontakte s dugim učenicima, a redovni su razredi za njih često jedna deprimirajuća, konfliktna i frustrirajuća sredina koja dodatno ugrožava njihovu socijalizaciju.

Zato je Specijalna olimpijada Bosne i Hercegovine kao jedina akreditoavana sportska organizacija koja sprovodi programe inkluzije kroz inkluzivne sportove obavezna da sprovodi sportske inkluzivne aktivnosti koje su predviđene Strategijom Svjetske specijalne olimpijade za period 2021-2024., jer je dokazano da je najlakši put za integraciju kroz sportske inkluzivne aktivnosti. Poseban program koji se sprovodi u Bosni i Hercegovini je program «Mladi sportaši» koji je namijenjen djeci od 2-7 godina i koji se implementira već 5 godina.

**Cljučne riječi:** osobe sa poteškoćama, inkluzija, sport, integracija

## INCLUSIVE SPORTS AS A STRATEGIC COMMITMENT OF THE SPECIAL OLYMPICS FOR THE PERIOD 2021-2024

### ABSTRACT

Problems of inclusion in preschool institutions also refer to the maladaptation of children with special needs to other children (5.1%), to the prejudices of parents of children without developmental problems (5.1%) as well as to the unwillingness of parents of children with special needs to cooperate. According to the respondents, not only "healthy" children are not prepared for inclusion, but also those with special needs. In other words, it is not easy for either group of children when they spend a significant period of time together on a daily basis. But it's not just children's reactions that are problematic. The situation is also complicated by the parents! Opinions are that their children will be neglected, endangered, left "aside". As a result, some act in the light of prejudice against people with special needs, while others are dishonest and hide the child's diagnosis or keep silent that the child is under continuous drug therapy.

In general, it can be concluded that integration does not achieve the main goal of its implementation, which is to gain a more favorable social and emotional experience of children with disabilities, which will allow them to later successfully integrate into social and professional life in the majority world. Simply put, neither of them acquires such an experience in today's school, so integration for many of them becomes another factor that causes separation, isolation from each other, and mutual misunderstanding. Students with disabilities often fail to establish good social contacts with long-term students, and regular classes are often a depressing, conflictual, and frustrating environment for them that further jeopardizes their socialization. That is why the Special Olympics of Bosnia and Herzegovina, as the only accredited sports organization that implements inclusion programs through inclusive sports, is obliged to implement inclusive sports activities envisaged by the World Special Olympics Strategy for the period 2021-2024, because it has been proven to be the easiest way to integrate through sports. Inclusive activities. A special program implemented in Bosnia and Herzegovina is the program "Young Athletes" which is intended for children aged 2-7 and which has been implemented for 5 years

**Key words:** people with disabilities, inclusion, sports, integration

## ZDRAVSTVENI TURIZAM U POST COVID-U

Višnja Kojić, Senad Tatarević

*Panevropski univerzitet "Apeiron" Banjaluka, Republika  
Srpska, Bosna i Hercegovina*

### APSTRAKT

U posljednjih godinu dana, svjetska kriza izazvana virusom COVID-19, stihijski je preokrenula način života na planeti i naglo povećala broj bolesnih i umrlih. Pandemija je ugrozila čovječanstvo. Zdravlje je postalo osnovni imperativ i mjera sveukupnog života.

Od naučnika i stručnjaka očekivalo se brzo i efikasno rješenje.

Korona virus nam je ukazala na drugačiji tip krize u odnosu na sve ranije krize i nametnula traženje novih rješenja, kada su u pitanju prevencije u očuvanju zdravlja, održiv razvoj, te nove obrasce korišćenja prirodnih i ljudskih resursa. Na osnovu navedenog, cilj rada je predstaviti ideju kako aktuelna dešavanja i neprilike pretvoriti u preduzetničke šanse i prilike, te stanovništvu ponuditi medicinske usluge u prevenciji zdravlja i rehabilitacije kroz programe zdravstvenog turizma. Koristeći podatke iz medija, zaključak rada je da inovacijama, razvojem i unapređenjem prirodnih, ljudskih i medicinskih resursa, pored očuvanja zdravlja, jačanja zdravstvenog turizma, aktiviraće se i unaprijediti preduzetništvo, samozapošljavanje, zapošljavanje i ekonomija.

**Ključne riječi:** COVID-19, zdravlje, medicina, zdravstveni turizam, ekonomija.

## HEALTH TOURISM IN POST COVID

Višnja Kojić, Senad Tatarević

*Pan-European University "Apeiron" Banja Luka, the  
Republic of Srpska, Bosnia and Herzegovina*

### ABSTRACT

During the last year, the global crisis caused by the COVID-19 virus has spontaneously reversed the way of life on our planet and it has sharply increased the number of sick and dead people. The pandemic has threatened humanity. Health has become a basic imperative and a measure of overall life.

Scientists and experts were have been expected to find a quick and efficient solution.

Coronavirus presented out to us a different type of crisis comparing to all previous world crises and when it comes to prevention in health, sustainable development, and new patterns of use of human and natural resources it has imposed the search for new solutions. Based on mentioned facts, the aim of the paper is to present the idea of how to turn current events and predicaments into entrepreneurial opportunities, and to offer medical services to the population in health prevention and rehabilitation through health tourism programs. Using the data from the media, the conclusion of the paper is that the promotion, development, innovation and improvement of natural and medical resources, in addition to health tourism, will improve entrepreneurship, self-employment, employment and the economy.

**Key words:** COVID-19, health, medicine, health tourism, economics.



## RAZLIKE U SITUACIJSKOJ UČINKOVITOSTI IZMEĐU VATERPOLISTA I VATERPOLISTICA

Ognjen Uljević, Nikola Foretić, Vladimir  
Pavlinović, Šime Veršić

*Kineziološki fakultet, Sveučilište u Splitu*

### ABSTRAKT

Cilj ovog istraživanja bio je utvrditi razlike u situacijskoj učinkovitosti između najboljih europskih seniorskih vaterpolista i vaterpolistica. Uzorak ispitanika se sastojao od 132 vaterpolistica i 176 vaterpolista koji su sudjelovali na 34-tom Europskom vaterpolo prvenstvu za muškarce i žene održane 2020 u Budimpešti/Mađarska. U radu su korištene varijable situacijske učinkovitosti i to; AG-golovi iz igre, AS-šutovi iz igre, CG-, CS-, XG-golovi sa igračem više, XS-šutovi sa igračem više, 6mG-golovi sa 6 metara, 6mS-šutovi sa 6 metara, PSG-golovi iz kaznenog udarca, PSS-šutovi iz kaznenog udarca, ASS-asistencije. Od promatranih varijabli, značajna razlika između vaterpolista i vaterpolistica primjećena je samo kod dviju varijabli i to XS i AS. Razlike u navedenim varijablama vjerojatno su posljedica različitog stila igre između muškaraca i žena, gdje kod muškaraca dominira fizička snaga s jako puno hrvanja dok kod žena dominiraju plivačke sposobnosti.

**Ključne riječi:** vaterpolo, muškarci, žene, situacijska učinkovitost

**Abstract:** The aim of this study was to determine the differences in situational effectiveness between the best European senior water polo male and female players. The sample consisted of 132 female water polo players and 176 male water polo players who participated in the 34th European Water Polo Championship for men and women held in 2020 in Budapest / Hungary. Situational efficiency variables were used in the study; AG-goals from the game, AS-shots from the game, CG-, CS-, XG-goals with an extra player, XS-shots with an extra player, 6mG-goals from 6 meters, 6mS-shots from 6 meters, PSG-goals from penalty, PSS-shots from penalty, ASS-assists. From the measured variables, a significant difference between water polo players and water polo players was observed only in two variables, namely XS and AS. The differences in these variables are probably due to the different style of play between men and women, where men's style of play is characterized by physical strength with a lot of wrestling while in women's water polo swimming abilities are more crucial.

**Keywords:** water polo, men, women, situational effectiveness

# UPRAVLJANJE I PROMOVISANJE ZDRAVLJA KROZ EFIKASNOST LIJEČENJA SKOLIOZE KOD DJECE METODOM KOREKTIVNE GIMNASTIKE

Jana Aleksić<sup>1</sup>, Gordan Bajić<sup>1</sup>, Kemal Kličić<sup>2</sup>

<sup>1</sup>Fakultet ekonomskih nauka, Panevropski univerzitet „Apeiron“ Banja Luka,

<sup>2</sup>Fakultet zdravstvenih nauka, Panevropski univerzitet „Apeiron“ Banja Luka,

## APSTRAKT

Skolioza je deformitet kičmenog stuba, koji se definiše kao lateralno krivljenje kičmenog stuba, u frontalnoj ravni i uglavnom se javlja kod djece. Veoma je bitno pravovremeno uočavanje skolioze. Skolioze mogu biti jednostruke, dvostruke i višestruke. Ovaj rad se bazira na primjeni metode Banjica, kineziterapijskom programu, za korekciju skoliotične krivine. Kroz istraživanje, primjenu metode, kao i rezultate učestvovalo je trideset djece, u određenom vremenskom periodu. Banjica program obuhvata tačno određeni skup kineziterapijskih vježbi, koje se izvode u prisutnosti stručnog fizioterapeuta, koji može dovesti do potpunog ispravljanja postojećeg kičmenog deformiteta. Kineziterapijska tehnika se sastoji od programa vježbi koji se ponavlja svakog dana, bez prekida, do završetka liječenja, odnosno korekcije postojeće, skoliotične krivine, na odgovarajućoj lokalizaciji kičmenog stuba. Cilj rada se ogleda u tome da se prikaže rezultat i uspješna primjena ovog programa kod djece školskog uzrasta. Neophodno je pretpostavljenu hipotezu, koja se ogleda kroz uspješnost programa kod djece školskog uzrasta, predstaviti statistički i deskriptivno. Cilj rada je predstaviti neophodnost promovisanja zdravlja, kroz rezultate uspješnosti rada na deformitetima, koji se ogledaju, u posebnom načinu rada i posvećenosti, kada je u pitanju korektivno vježbanje kod djece. Zdravlju teže i odrasli i djeca. Važno je uspostaviti pravilne i zdrave navike kod djece, kako bi se razvila njihova svijest o tome koliko je važno da redovno vježbaju i utiču na bolju posturu svoga tijela. Osim što su djeca, svojim primjerom i radom, ambasadori zdravlja, neophodno je uvesti i druge načine promotivnih kanala, kako bi se kroz upravljanje promotivnim kanalima, podigla svijest odraslih i djece, o važnosti uticaja lične akcije i vježbanja na pravilan način, a sve u cilju poboljšanja opšteg zdravlja tijela i uma.

**Ključne riječi:** skolioza, banjica, kineziterapija, promocija, zdravlje

## APSTRACT

Scoliosis is a type of spine deformity, which is defined as a lateral curvature of the spine, in the coronal plane, and it is usually diagnosed in childhood. Timely detection of scoliosis is very important. Scoliosis can be single, double and multiple. This paper is based on the application of the Banjica method, a kinesitherapy program, for the correction of scoliotic curvature. In a certain period of time, thirty children participated in the research, application of the method, as well as in the results. The Banjica program includes a specific set of kinesitherapy exercises, performed in the presence of a professional physiotherapist, which can lead to a complete correction of the existing spinal deformity. The kinesitherapy technique includes an exercise program that is repeated every day, without interruption, until the end of the treatment, ie the correction of the existing, scoliotic curve, at the appropriate localization of the spine. The aim of this paper is to show the result and successful application of this program in school-age children. It is necessary to present descriptive statistics of the assumed hypothesis, which is reflected in the success of the program in school-age children. The aim of this paper is to present the need of health promotion, through the successful results on deformities, which are reflected in a special way of work and commitment, when it comes to corrective exercise in childhood. Both adults and children strive for health. In order to develop the awareness of how important it is to exercise regularly and influence the better posture of the body, it is important to establish proper and healthy habits in childhood. Even though the children, considering their example and work, are great ambassadors of health, it is necessary to introduce other ways of promotional channels. In order to improve the general health of the body and mind, it is important to raise the awareness of adults and children about the importance of the impact of personal action and exercise in the right way through the management of promotional channels.

**Key words:** scoliosis, spa, kinesitherapy, promotion, health

## OSNOVE MOTORIČKE PRIPEME U KOŠARCI

Saša Milićević<sup>1</sup>, Dragana Drljačić<sup>2</sup>, Nenad Rađević<sup>3</sup>

<sup>1</sup>KK Metalac, Valjevo

<sup>2</sup>Visoka sportska i zdravstvena škola - Beograd, Srbija Sportsko – dijagnostički centar Šabac – Šabac, Srbija

<sup>3</sup>Fakultet sportskih nauka, Panevropski univerzitet Apeiron, Banja Luka

### APSTRAKT

Košarka spada u grupu acikličnih sportova, koja pored tehničke i taktičke pripreme, zahtjeva i izuzetnu fizičku pripremu sportista. Fizička ili kondiciona priprema se može nazvati i energetska – motorička priprema i fokusirana je na razvoj i održavanje motoričkih, odnosno fizičkih sposobnosti, definisanih kao: snaga, brzina, fleksibilnost, koordinacija, ravnoteža i preciznost. Biomotorički, odnosno kondicioni potencijal košarkaša definiše se kao maksimalna granica fizičke radne sposobnosti koju pojedini košarkaš postiže treningom (Karalejić, Jakovljević, 2001). U trenažnom procesu veoma je bitno odrediti karakter i strukturu motoričkih sposobnosti u odnosu na uzrast, pol, stepen treniranosti, genetiku, konstituciju, zahteve savremene košarke i koncept dugoročne pripreme košarkaša. Trenažne jedinice usmjerene za razvoj motoričkih sposobnosti sadrže podatke o vežbama, opterećenjima i metodama rada, vremenu potrebnom za postizanje rezultata i vremenu oporavaka. U radu sa mlađim kategorijama, neophodno je poznavati senzitivne periode razvoja motoričkih sposobnosti, odnosno kritične faze razvoja istih. U posljednje vrijeme, savremena trenažna tehnologija u košarci sve više je usmjerena ka razvoju specifičnih motoričkih sposobnosti košarkaša tj. funkcionalnom treningu što je ujedno i cilj ovog rada.