

МЕЂУНАРОДНА НАУЧНА КОНФЕРЕНЦИЈА

Ефекти примене физичке активности на антрополошки статус деце, омладине и одраслих

Зборник сажетака



Book of abstracts

International Scientific Conference

Effects of Physical Activity Application to Anthropological Status with Children, Youth and Adults



Ministarstvo prosvete
i tehnološkog razvoja



Република Србија
МИНИСТАРСТВО
ОМЛАДИНЕ
И СПОРТА



Универзитет у Београду
Факултет спорта и физичког васпитања

Београд, 11-12 децембар 2012.



The image shows the cover of a brochure for the 'f sfv 2012 conference'. The background is a photograph of a cable-stayed bridge, with numerous white cables fanning out from a central point on the left towards the right. The cables create a strong sense of perspective and depth. At the top center, the logo for the conference is displayed. It features a stylized blue figure of a person jumping or running, followed by a large 'f' with a red vertical bar on its left side and a blue vertical bar on its right side. To the right of the 'f' is the text 'sfv 2012' in a blue, sans-serif font. Below the 'f' and 'sfv 2012' is the word 'conference' in a blue, serif font.

 **f** sfv 2012
conference



MEĐUNARODNA NAUČNA KONFERENCIJA

EFEKTI PRIMENE FIZIČKE AKTIVNOSTI
NA ANTROPOLOŠKI STATUS
DECE, OMLADINE I ODRASLIH

Zbornik sažetaka

INTERNATIONAL SCIENTIFIC CONFERENCE

EFFECTS OF PHYSICAL ACTIVITY APPLICATION TO
ANTHROPOLOGICAL STATUS
WITH CHILDREN, YOUTH AND ADULTS

Book of Abstracts

Međunarodna naučna konferencija

Efekti primene fizičke aktivnosti na antropološki status dece, omladine i odraslih / Zbornik sažetaka

International Scientific Conference

Effects of Physical Activity Application to Anthropological Status With Children, Youth and Adults / Book of Abstract

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University of Belgrade, Faculty of Sport and Physical Education

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**MEĐUNARODNA NAUČNA KONFERENCIJA
EFEKTI PRIMENE FIZIČKE AKTIVNOSTI
NA ANTROPOLOŠKI STATUS
DECE, OMLADINE I ODRASLIH**

Zbornik sažetaka

**INTERNATIONAL SCIENTIFIC CONFERENCE
EFFECTS OF PHYSICAL ACTIVITY APPLICATION TO
ANTHROPOLOGICAL STATUS
WITH CHILDREN, YOUTH AND ADULTS**

Book of Abstracts

Beograd, 11.-12. decembar 2012.

PROGRAM RADA NAUČNE KONFERENCIJE 2012

2012 SCIENTIFIC CONFERENCE PROGRAMME

„EFEKTI PRIMENE FIZIČKE AKTIVNOSTI NA
ANTROPOLOŠKI STATUS DECE, OMLADINE I ODRASLIH“

“EFFECTS OF PHYSICAL ACTIVITY APPLICATION TO
ANTHROPOLOGICAL STATUS WITH CHILDREN, YOUTH AND ADULTS“

Prvi dan: utorak (11. decembar 2012.) – AMF 1 /

First day: Tuesday, 11. December, 2012 (Hall 1)

09:00 – 12:00 **Registracija učesnika / *Registration of participants***

14:00 – 14:15 **Otvaranje Konferencije / *Opening of conference***

Predsedavajući / *Chairmans: Milivoj Dopsaj, Irina Juhas, Goran Kasum, Grigoris Bogdanis*

Pozdravni govor – predsednik Naučnog odbora van. prof. dr Milivoj Dopsaj
Welcome Speech: President of the Scientific Board Prof. dr Milivoj Dopsaj

14:15 – 15:45 **Plenarni rad – Pozivna predavanja / *Plenary – Key Note Speakers***

14:15 – 15:00

Prof. dr Branislav Jevtić

Univerzitet u Beogradu, Fakultet sporta i fizičkog vaspitanja

University of Belgrade, Faculty of Sport and Physical Education

OLIMPIJSKI PROGRAMI – SISTEM INOVACIJA U SPORTU SRBIJE

OLYMPIC PROGRAMS - SYSTEM OF INNOVATION IN SERBIAN SPORTS

15:00 – 15:45

Prof. dr sci. med. Jagoda Jorga

Univerzitet u Beogradu, Medicinski fakultet

University of Belgrade, Faculty of Medical Sciences

FIZIČKA NEAKTIVNOST/AKTIVNOST I GOJAZNOST -CAUSA SINE QUA NON

PHYSICAL INACTIVITY/ACTIVITY AND OBESITY – CAUSA SINE QUA NON

15:45-16:00 **Diskusija / *Discussion***

16:00 – 17:00 **Koktel u holu Fakulteta / *Coctail in Faculty Hall***

17:00 – 19:00 *Sesije / Sessions – Saopštenja / Presentations*

Prvi dan: utorak (11. decembar 2012.) – AMF 1

First day: Tuesday, 11. December, 2012 (Hall 1)

AMF 1 / Hall 1

Moderatori / *Chairmans*: **prof. dr Božo Bokan, prof. dr Grigoris Bogdanis, prof. dr Ivo Jirásek**

17:00 – 18:20 *Radovi / Presentations*

18:20 – 18:40 *Diskusija / Discussion*

AMF 2 / Hall 2

Moderatori / *Chairmans*: **prof. dr Dušan Mitić, prof. dr Vladimir Koprivica**

17:00 – 18:20 *Radovi / Presentations*

18:20 – 18:30 *Diskusija / Discussion*

AMF 3 / Hall 3

Moderatori / *Chairmans*: **prof. dr Dragoljub Višnjić, prof. dr Milan Čoh**

17:00 – 18:45 *Radovi / Presentations*

18:45 – 19:00 *Diskusija / Discussion*

AMF 4 / Hall 4

Moderatori / *Chairmans*: **prof. dr Milivoj Dopsaj, prof. dr Boban Milojković**

17:00 – 18:40 *Radovi / Presentations*

18:40 – 19:00 *Diskusija / Discussion*

Drugi dan: sreda (12. decembar 2012.) / *Second day – Wednesday, 12 December 2012*

09:00 – 13:30 ***Rad po sesijama – Saopštenja / Sessions***

AMF 1 / Hall 1

Moderatori / *Chairmans*: **prof. dr Nastas Ilić, doc. dr Vladimir Ilić**

09:00 – 10:00 *Radovi / Presentations*

10:00 – 10:15 *Diskusija / Discussion*

10:15 – 10:30 *Kafe pauza / Coffee break*

AMF 1 / Hall 1

Moderatori / *Chairmans*: **prof. dr Sanja Mazić, doc. dr Marina Đorđević-Nikić**

10:30 – 11:40 *Radovi / Presentations*

11:40 – 12:00 *Diskusija / Discussion*

AMF 1 / Hall 1

Moderatori / *Chairmans*: **doc. dr Fadilj Eminović, doc. dr Vladimir Ilić**

12:10 – 13:00 Radovi / *Presentations*

13:00 – 13:20 Diskusija / *Discussion*

AMF 2 / Hall 2

Moderatori / *Chairmans*: **prof. dr Srećko Jovanović, prof. dr Goran Kasum**

09:00 – 10:00 Radovi / *Presentations*

10:00 – 10:15 Diskusija / *Discussion*

10:15 – 10:30 Kafe pauza / *Coffee break*

AMF 2 / Hall 2

Moderatori / *Chairmans*: **prof. dr Vladimir Koprivica, prof. dr Srećko Jovanović**

10:30 – 11:40 Radovi / *Presentations*

11:40 – 12:00 Diskusija / *Discussion*

AMF 2 / Hall 2

Moderatori / *Chairmans*: **prof. dr Goran Kasum, prof. dr Marko Aleksandrović**

12:10 – 13:00 Radovi / *Presentations*

13:00 – 13:20 Diskusija / *Discussion*

AMF 3 / Hall 3

Moderatori / *Chairmans*: **prof. dr Božo Bokan, prof. dr Marko Aleksandrović**

09:00 – 10:00 Radovi / *Presentations*

10:00 – 10:15 Diskusija / *Discussion*

10:15 – 10:30 Kafe pauza / *Coffee break*

AMF 3 / Hall 3

Moderatori / *Chairmans*: **prof. dr Goran Nešić, prof. dr Nenad Filipović**

10:30 – 11:30 Radovi / *Presentations*

11:30 – 12:00 Diskusija / *Discussion*

AMF 4 / Hall 4

Moderatori / *Chairmans*: **prof. dr Đorđe Stefanović, prof. dr Vesna Babić,
prof. dr Branko Škof**

09:00 – 10:10 Radovi / *Presentations*

10:10 – 10:20 Diskusija / *Discussion*

10:20 – 10:30 Kafe pauza / *Coffee break*

AMF 4 / Hall 4

Moderatori / *Chairmans*: **prof. dr Irina Juhas, prof. dr Goran Bošnjak,
doc. dr Nenad Janković**

10:30 – 11:40 Radovi / *Presentations*

11:40 – 12:00 Diskusija / *Discussion*

Moderatori / *Chairmans*: **prof. dr Dušan Mitić, prof. dr Dana Badau, prof. dr Grigoris Bogdanis**

12:00 – 13:30 Radionica – Poster prezentacije

Work Shops – Posters presentations (Hodnik između AMF 1 i AMF 2)

Moderatori / *Chairmans*: **prof. dr Milivoj Dopsaj, prof. dr Goran Kasum, prof. dr Irina Juhas**

13:40 – 14:00 **AMF I: Plenarni rad – Zaključni rad Konferencije /**

Plenary – End of Conference

UTORAK / TUESDAY – 11. DECEMBAR 2012.

RAD PO SESIJAMA / WORK IN SESSION

SESIJA 1 / SESSION 1

Teorijsko-filozofski aspekti istraživanja efekata primene fizičkih aktivnosti
u fizičkom vaspitanju, sportu i rekreaciji

Theoretical-philosophical aspects of the effects of physical activity application
in PE, sport and recreation

AMF 1 / Hall 1

17:00 – 18:40

Moderatori / *Chairmans*: **prof. dr Božo Bokan, prof. dr Grigoris Bogdanis, prof. dr Ivo Jirásek**

17:00-17:20	Đorđe Stefanović	Antropološki i teološki aspekti duha i tela sportiste
17:20-17:30	Samouilidou Evdokia, Mouratidis Konstantin	Linking of social and cultural identity through traditional dances teaching
17:30-17:40	Athanasios Alatzoglou, Ioannis Athanailidis, Miltiadis Proios, Vassilia Arvanitidou	The physical education teacher as a principal and the identification of the need to improve administrative competence with a view to an effective school
17:40-17:50	Boban Milojković, Irina Juhas, Miroslav Stevanović, Jelena Kozoderović	Orijentiring karte za potrebe nastave fizičkog vaspitanja
17:50-18:00	Natalija Mihajlović, Goran Prebeg, Dušan Mitić	Speleologija kao oblik fizičke aktivnosti
18:00-18:10	Ivo Jirásek	Motivation for movement and the active lifestyle from reading of belles-lettres: problematization of the categories “extrinsic” and “intrinsic”
18:10-18:20	Dejan Gavrilović, Milija Ljubisavljević	Fizičko vežbanje u vojsci Kraljevine Srbije
18:20-18:40	DISKUSIJA / DISCUSSION	

RAD PO SESIJAMA / *WORK IN SESSION*

SESIJA 2 / *SESSION 2*

Istraživačko-metodološki efekata primene fizičkih aktivnosti
u fizičkom vaspitanju, sportu i rekreaciji

Research-methodological aspects of the effects of physical activity application
in PE, sport and recreation

AMF II / Hall 2

17:00 – 18:30

Moderatori / *Chairmans*: **prof. dr Dušan Mitić, prof. dr Vladimir Koprivica**

17:00-17:20	Miloš Marković, Božo Bokan, Nikola Makić, Đorđe Nikolić	Procena aktivnosti učenika i nastavnika na časovima fizičkog vaspitanja primenom instrumenta SOFIT u nekim gradovima Srbije
17:20-17:30	Ivana Đačić, Dušanka Lazarević Ana Orlić, Snežana Radisavljević Janić	Efekti primene muzike na formiranje stava učenika prema fizičkom vaspitanju
17:30-17:40	Saša Pantelić, Zoran Milanović, Radmila Kostić, Slavoljub Uzunović, Bojan Jorgić	Da li kvalitet života i fizički fitnes zavise od nivoa fizičke aktivnosti kod starih muškaraca?
17:40-17:50	Josip Lepeš, Halaši Sabolč	Relacije između nekih antropoloških obeležja i opšteg školskog uspeha kod dece mlađeg školskog uzrasta
17:50-18:00	Nikola Foretić, Ante Burger, Nenad Rogulj, Tanja Bolanča	Razlike u smjeru i učinkovitosti šutiranja između muškog i ženskog vrhunskog rukometa
18:10-18:20	Ante Burger, Nenad Rogulj, Nikola Foretić, Igor Jelaska, Luka Bjelanović	Razlike smjera šutiranja spram položaja izbačajne ruke u rukometu
18:20-18:30	DISKUSIJA / <i>DISCUSSION</i>	

RAD PO SESIJAMA / *WORK IN SESSION*

SESIJA 3 / SESSION 3

Metodički aspekti efekata primene fizičkih aktivnosti
u fizičkom vaspitanju, sportu i rekreaciji

Aspects of teaching methods of the effects of physical activity application
in PE, sport and recreation

AMF III / Hall 3

17:00 – 19:00

Moderatori / *Chairmans*: **prof. dr Dragoljub Višnjić, prof. dr Milan Čoh**

17:00-17:20	Stanimir Stojiljković, Marina Đorđević-Nikić, Dušan Mitić, Slaven Popović	„Fitnes izazov“ - program vežbanja i ishrane kao model podsticanja na redovno vežbanje
17:20-17:30	Živković Milena, Stamenković Miljana, Pantelić Saša, Aleksandar Ivanovski	Interesovanja i mišljenja dece o programu rekreativne nastave
17:30-17:40	Gorana Tešanović, Zlatko Babić, Goran Bošnjak	Efekti primjene korektivnog vježbanja na korekciju posturalnih poremećaja srednjoškolske omladine
17:40-17:50	Vladimir Jakovljević, Adriana Ljubojević	Differences of coordination in relation to sex, age and physical activity in younger students
17:50-18:00	Miroslav Marković, Miloš Marković, Dragoljub Višnjić, Mladen Petković	Aktuelni problemi bavljena sportom učenika osnovne škole
18:00-18:10	Branislav Rajić, Carlos Pablos Abella, Dopsaj Milivoj, Karišik Siniša	Efekti kombinovanog i klasičnog treninga na različite parametre izometrijskog gradijenta mišićne sile opružaća nogu kod odbojkašica: diskriminativna analiza
18:10-18:20	Milan Matić	Uticaj različitih spoljašnjih povratnih informacija na motorno učenje
18:20-18:30	Radivoje Janković, Raša Dimitrijević, Goran Vučković, Nenad Koropanovski	Uticaj pripreme nastave na nivo motoričkih sposobnosti kandidatkinja za upis na kriminalističko-policijsku akademiju
18:30-18:40	Branimir Lukić, Goran Nešić, Nikola Majstorović	Komparativna analiza morfoloških osobina i nekih motoričkih sposobnosti profesionalnih vojnika 4. brigade kopnene vojske
18:40-19:00	DISKUSIJA / DISCUSSION	

RAD PO SESIJAMA / *WORK IN SESSION*

SESIJA 5 / SESSION 5

Interdisciplinarni pristup u istraživanju efekata primene fizičkih aktivnosti
(društveno-humanističke nauke)

Interdisciplinary approach in research of the effects of physical activity application
(social sciences and humanities)

AMF IV / Hall 4

17:00 – 19:00

Moderatori / *Chairmans*: **prof. dr Milivoj Dopsaj, prof. dr Boban Milojković**

17:00-17:20	Goran Nikovski, Elena Petković, Ilija Klinčarov, Dušan Mitić	Differences in engagement in physical activities in leisure time between students of Belgrade and Skopje State Universities
17:20-17:30	Dragoljub Višnjić, Živorad Marković, Jelena Ilić	Pedagoške implikacije realizacije sportsko – tehničkog obrazovanja u srednjoj školi
17:30-17:40	Vladimir Milošević, Adam Petrović, Milena Živković	Interesovanja za fizičke aktivnosti učenika osnovnih škola u Sremskoj Mitrovici, Jagodini i Nišu
17:40-17:50	Milica Nikolić, Vladimir Kitanović, Tijana Ćirković, Ljubica Bačanac	Povezanost takmičarske anksioznosti sa fiziološkim i bihevioralnim indikatorima stresa kod sportista
17:50-18:00	Dalibor Kekić, Dane Subošić	Postupanje jedinica policije u suzbijanju nasilja na sportskim manifestacijama
18:00-18:10	Goran Vučković, Milivoj Dopsaj	Uticaj osnovne obuke upotrebe službenog pištolja na efikasnost gađanja kod studenata kriminalističko-policijske akademije
18:10-18:20	Dane Subošić, Dalibor Kekić	Stanje i tendencije nasilja na sportskim priredbama u Republici Srbiji u periodu 2009. do 2011. godine
18:20-18:30	Nevena Jovanović, Ana Orlić, Dušanka Lazarević	Opažanje izvora lične kompetentnosti u nastavi fizičkog vaspitanja
18:30-18:40	Luka Popovski, Goran Nikovski	Valorization (valuation) of sports and recreational activities of the mountain "Vodno" according to climatic and geographical conditions in a group of mountaineers
18:40-19:00	DISKUSIJA / <i>DISCUSSION</i>	

SREDA / WEDNESDAY – 12. DECEMBAR 2012.

RAD PO SESIJAMA / WORK IN SESSION

SESIJA 6 / SESSION 6

Interdisciplinarni pristup u istraživanju efekata primene fizičkih aktivnosti (biomedicinske nauke)

Interdisciplinary approach in research of the effects of physical activity application (biomedical sciences)

AMF I / Hall 1

09:00-10:15

Moderatori / *Chairmans*: **prof. dr Nastas Ilić, doc. dr Vladimir Ilić**

9:00-9:20	Miloš Maksimović	Fizička aktivnost i hronične nezarazne bolesti
9:20-9:30	Milivoj Dopsaj, Marina Nikić-Đorđević, Dragan Miljuš, Vladimir Ilić, Marija Macura	Cut Off vrednosti uzrasta kod populacije odraslih muškaraca R. Srbije u funkciji indikatora gojaznosti
9:30-9:40	Luka Bjelanović, Lucijana Krželj, Katarina Pelivan, Miran Pehar	Some spirometry differences before and after rugby training
9:40-9:50	Irina Juhas, Milan Matić, Vladimir Ilić, Nenad Janković, Marija Macura	Efekti osmonedeljnog programa kros trčanja na aerobne sposobnosti i telesni sastav studentkinja
9:50-10:00	Dejan Ilić, Dana Cvjetković, Saša Đurić	Zastupljenost telesnih deformiteta polaznika škole plivanja
10:00-10:15	DISKUSIJA /DISCUSSION	

10:15 – 10:30 Kafe pauza / Coffee break

10:30-12:00Moderatori / *Chairmans*: **prof. dr Sanja Mazić, doc. dr Marina Đorđević-Nikić**

10:30-10:50	Darko Ivanović, Biljana Stojanović	Sportska farmacija – uloga farmaceuta u borbi protiv dopinga u sportu
10:50-11:00	Marija Macura, Nataša Andreovski Krivokuća, Dušan Mitić, Stanimir Stojiljković	Uticao individualno programiranog vežbanja u fitnes studiju „Fiesta“ na promene morfološko–funkcionalnih karakteristika rekreativaca
11:00-11:10	Milivoj Dopsaj, Goran Prebeg, Marija Macura, Marina Đorđević-Nikić, Raša Dimitrijević, Vladimir Ilic	Trend promena indikatora gojaznosti kod populacije muškaraca Beograda u funkciji uzrasta
11:10-11:20	Vojislav Giga, Nenad Dikić, Ana Đorđević-Dikić, Jelena Stepanović, Milorad Tešić, Bosiljka Vujisić-Tešić	Dilatacija aorte kod profesionalnog kajakaša
11:20-11:30	Dušan Antić, Sergej Ostojić	Analiza informisanosti srpskih atletičara o doping
11:30-11:40	Snežana Radisavljević Janić, Ivana Milanović, Dragan Mirkov	Fizička aktivnost i motoričke sposobnosti adolescenata sa normalnom i prekomernom telesnom težinom
11:40-12:00	DISKUSIJA / <i>DISCUSSION</i>	

RAD PO SESIJAMA / *WORK IN SESSION***SESIJA 4 / *SESSION 4***

Efekte primene fizičkih aktivnosti na antropološki status populacije
u specijalizovanim ustanovama (osobe sa posebnim potrebama, policija, vojska)

The effects of application of physical activity to anthropological status
in specialized institutions (persons with special needs, police forces, army)

AMF I / Hall 1**12:10-13:20**Moderatori / *Chairmans*: **doc. dr Fadilj Eminović, doc. dr Vladimir Ilić**

12:10-12:30	Fadilj Eminović, Radmila Nikić, Neda Buljubašić, Sanela Pacić	Deficiti u socijalnom ponašanju dece sa smetnjama u razvoju na času fizičkog vaspitanja
12:30-12:40	Bojana Mladenović, Radmila Nikić, Aleksandra Grbović, Marina Kuzmanović	Uticao prilagođenog programa fizičke aktivnosti plivanja na osobe ometene u razvoju
12:40-12:50	Milošević Kristina	Plesovi u nastavi osoba sa senzornim oštećenjima sluha
12:50-13:00	Irena Stojković, Sanja Dimoski, Fadilj Eminović, Biljana Milanović Dobrota	Sklonosti ka različitim vrstama aktivnosti adolescenata sa lakom mentalnom retardacijom
13:00-13:20	DISKUSIJA / <i>DISCUSSION</i>	

RAD PO SESIJAMA / WORK IN SESSION/

SESIJA 2 /SESSION 2

Istraživačko-metodološki efekata primene fizičkih aktivnosti
u fizičkom vaspitanju, sportu i rekreaciji

Research-methodological aspects of the effects of physical activity application
in PE, sport and recreation

AMF II / Hall 2

09:00 – 10:15

Moderatori / *Chairmans*: **prof. dr Srećko Jovanović, prof. dr Goran Kasum**

9:00-9:20	Nenad Koropanovski, Srećko Jovanović, Aleksandar Nedeljković, Berjan Bobana	Kinematičke karakteristike udarca rukom vrhunskih karatista različite specijalizacije
9:20-9:30	Miloš Mudrić, Jelena Ivanović, Srđan Marković	Karakteristike sile mišića nogu vrhunskih karatista u odnosu na opšte treniranu populaciju
9:30-9:40	Miodrag Spasić, Emina Martić, Ivan Perasović	Povezanost izvođenja judo bacanja s primenjenim uglom u zglobu kolena
9:40-9:50	Radomir Zrnić, Predrag Dragosavljević, Dušan Mitić, Milena Mikalački	Nivoi transformacionih promjena morfoloških karakteristika žena pod uticajem različitih modela sportsko-rekreativnih aktivnosti
9:50-10:00	Ivan Zorić, Josip Tomaško	Uticaj rekreativnog bavljenja sportom na neke varijable antropološkog statusa
10:00-10:15	DISKUSIJA / <i>DISCUSSION</i>	

10:15 – 10:30 Kafe pauza / *Coffee break*

10:30 – 12:00

Moderatori / *Chairmans*: **prof. dr Vladimir Koprivica, prof. dr Srećko Jovanović**

10:30-10:50	Jelena Ivanović, Milivoj Dopsaj, Vladimir Koprivica, Saša Jakovljević, Dragan Radovanović	Funkcionalni dimorfizam F-t karakteristika opružača nogu kod vrhunskih sportista i netreniranih osoba
10:50-11:00	Zoran Bratuša, Milivoj Dopsaj	Vrednosti različitih indeksa specifične izdržljivosti merene u anaerobno alaktatnom režimu rada kod vrhunskih mladih vaterpolista
11:00-11:10	Dana Simona Turcanu	Study on the effectiveness of element technical: attack on the line II
11:10-11:20	Goran Nešić, Miloš Obradović, Milan Sikimić, Vladimir Ilić, Nikola Majstorović, Saša Đurić	Komparativna analiza određenih morfoloških karakteristika i motoričkih sposobnosti odbojkašica kadetskog uzrasta reprezentacija Srbije i Crne Gore
11:20-11:30	Nemanja Čopić, Milivoj Dopsaj, Srđan Marković	Reliabilnost karakteristika sile reakcije podloge standardizovanih skokova uvis kod treniranih i netreniranih osoba ženskog pola
11:30-11:40	Zoran Milenković, Zoran Bratuša	Razlike motoričkih sposobnosti u vodi selektiranih vaterpolista različitih generacija istog uzrasta
11:40-11:50	Nevenka Sredojević, Biljana Nikolić	Primena motoričkih testova u proceni pripremljenosti elitnih biciklista R. Srbije
11:50-12:00	DISKUSIJA / <i>DISCUSSION</i>	

RAD PO SESIJAMA / WORK IN SESSION/

SESIJA 4 / SESSION 4

Efekti primene fizičkih aktivnosti na antropološki status populacije u specijalizovanim usanovama (osobe sa posebnim potrebama, policija, vojska)

The effects of application of physical activity to anthropological status in specialized institutions (persons with special needs, police forces, army)

AMF II / Hall 2

12:10-13:20

Moderatori / *Chairmans*: **prof. dr Goran Kasum, prof. dr Marko Aleksandrović**

12:10-12:30	Sanja Dimoski, Irena Stojković, Eminović Fadilj, Grbović Aleksandra	Učešće i zadovoljstvo u svakodnevnim aktivnostima omladine sa lakom mentalnom retardacijom
12:30-12:40	Aleksandra Grbović, Sanja Dimoski, Irena Stojković, Eminović Fadilj	Učestvovanje mladih sa cerebralom paralizom u slobodnim aktivnostima
12:40-12:50	Marija Stanković, Marko Aleksandrović	Fizička aktivnost osoba sa intelektualnim invaliditetom
12:50-13:00	Goran Kasum, Bojana Milićević-Marinković, Marjan Marinković, Aca Kovačević, Boban Kasum	Uticaj šestomesečnog programa malog fudbala na motoričke sposobnosti intelektualno ometenih osoba
13:00-13:20	DISKUSIJA / <i>DISCUSSION</i>	

RAD PO SESIJAMA / WORK IN SESSION

SESIJA 3 /SESSION 3

Metodički aspekti efekata primene fizičkih aktivnosti u fizičkom vaspitanju, sportu i rekreaciji

Aspects of teaching methods of the effects of physical activity application in PE, sport and recreation

AMF III / Hall 3

09:00 – 10:15

Moderatori / *Chairmans*: **prof. dr Božo Bokan, prof. dr Marko Aleksandrović**

9:00-9:10	Silvija Kermeci, Dušan Mitić	Sportsko – rekreativne aktivnosti učenika osnovnih škola u gradskim i seoskim sredinama u Srbiji
9:10-9:20	Sanjin Džajić	Effects of sports games program to the motor abilities development in physical and health education
9:20-9:30	Milan Domanović, Srđan Marković, Božo Bokan	Uticaj programirane nastave fizičkog vaspitanja na morfološke i motoričke karakteristike učenika III i IV razreda osnovne škole
9:30-9:40	Danijela Bulatović, Drago Milošević	Efekti poligona sa preprekama na motoričke sposobnosti učenika
9:40-9:50	Damian Cosmin, Damian Roxana, Damian Mirela	Balance development for primary school students through attractive methods
9:50-10:00	Josip Tomaško, Ivan Zorić	Uticaj fizičke aktivnosti na uspeh u školi
10:00-10:15	DISKUSIJA / DISCUSSION	

10:15 – 10:30 Kafe pauza / Coffee break

10:30- 12:00

Moderatori / *Chairmans*: **prof. dr Goran Nešić, prof. dr Nenad Filipović**

10:30-10:50	Radun Vulović, Radivoje Radaković, Aleksandar Peulić, Dalibor Nikolić i Nenad Filipović	Metod softverskog praćenja i analize kretanja igrača tokom fudbalske utakmice
10:50-11:00	Dragiša Mladenović	Uspešnost usvajanja osnovne tehnike skijanja u odnosu na morfološke karakteristike kod dece
11:00-11:10	Srđan Bugarski, Vladimir Milošević, Srđan Marković	Uticaj tehničkog elementa vođenja lopte na rezultat u protokolima za procenu agilnosti
11:10-11:20	Radivoje Radaković, Robert Prosinečki, Žarko Đurović, Radun Vulović, Aleksandar Peulić, Dalibor Nikolić, Nenad Grubor, Nenad Filipović	Opšti parametri <i>Tracking Motion</i> analize igrača FK Crvena Zvezda tokom utakmice 3. kola kvalifikacija za ligu Evrope 2012/13.
11:20-11:30	Ivan Marović	Komparacija vežbe otvorenog i zamišljeno zatvorenog kinetičkog lanca: Efekti na motoričke sposobnosti koordinacije i dinamičke fleksibilnosti
11:30-12:00	DISKUSIJA / DISCUSSION	

RAD PO SESIJAMA / WORK IN SESSION/

SESIJA 7 /SESSION 7

Atletika

Track and Field

AMF IV / Hall 4

09:00 – 10:15

Moderatori / *Chairmans*: **prof. dr Đorđe Stefanović, prof. dr Vesna Babić,**
prof. dr Branko Škof

9:00-9:20	Đorđe Stefanović	Uticaj konstrukcije i načina nošenja štafete na brzinu trčanja
9:20-9:30	Vesna Repić Čujić, Irina Juhas	Nacionalna prvenstva u maratonu od 1930. u Kraljevini Jugoslaviji do 2010. u Republici Srbiji
9:30-9:40	Ljubinka Pavlov, Irina Juhas	Nastanak i razvoj maratona za žene u Srbiji
9:40-9:50	Goran Bošnjak, Vladimir Jakovljević, Gorana Tešanović, Sasa Jovanovic	Connection between lungs vital capacity and results of running on 100 m, 400 m and 800 m
9:50-10:00	Ljubica Bačanac, Vladimir Kitanović, Milica Nikolić, Tijana Čirković	Neke karakteristike psihološkog profila elitnih atletičara Srbije
10:00-10:10	Branko Škof, Bojan Leskošek, Maja Pori	Stress and satisfaction with life among slovene recreational runners
10:10-10:30	DISKUSIJA / DISCUSSION	

10:15 – 10:30 Kafe pauza / Coffee break

10:30- 12:00

Moderatori / *Chairmans*: **prof. dr Irina Juhas, prof. dr Goran Bošnjak,**
doc. dr Nenad Janković

10:30-10:50	Milan Čoh, Vesna Babić	The modern sprint model
10:50-11:00	Milan Čoh, Milan Zvan	Differences between the elite and sub-elite sprinters in kinematic and dynamic determinants of vertical jumps
11:00-11:10	Vesna Babić, Iva Blažević, Milan Čoh	Differences between girls and boys in kinematic parameters of sprinter`s running
11:10-11:20	Zdravković Miloš, Milan Matić	Uporedna analiza tehnike vrhunskih bacača koplja
11:20-11:30	Graur Cristian, Dr. Szabo Barna,	Differences between speed runing in pole vaulting compare between top pole vaulters and Romanian national top vaulters
11:30-11:45	Krasomenko Miletić, Vladimir Miletić	Realnije merenje rezultata u skoku u dalj i troskoku
11:45-12:00	DISKUSIJA / DISCUSSION	

SREDA / WEDNESDAY – 12. DECEMBAR 2012.

POSTERI / POSTERS

12:00- 13:30 Sesija posteri / Posters Sessions

Moderatori / *Chairmans*: **prof. dr Dušan Mitić, prof. dr Dana Badau, prof. dr Grigoris Bogdanis**

1.	Adela Badau	Correlation between: type of recreational water activities - the stress - professional qualification
2.	Florentina, Nechita, Raluca Mijaică	Monitoring parametres influence kinematics in the sample of 110 meters hurdles
3.	Bondoc-Ionescu Alexandru	The complex reaction between the specific muscular strength and the individual technique of clearing the bar during the high-jump
4.	Ciulea Laura, Ionescu Bondoc Dragos	The influence of modern technology on the efficiency of the serve in volleyball
5.	Grigor Gutev, Plamen Njagin	Research on the Bulgarian U14 track and field status and tendency of development
6.	Georgian Bădicu, Ciprian Prisăcariu	Study on the factors determining the density fluctuations of the variables involved in physical education and sports lessons - secondary school education
7.	Snežana Vujanović, Živko Kalentić, Vojin Jovančević, Nenad Sudarov, Branislav Strajnić, Dragana Golik-Perić, Branko Đukić	Specifičnosti kognitivnih sposobnosti fudbalskih golmana u odnosu na ostale igrače u timu
8.	Ramona Ungur	The use of information technology for the real-time improvement of the efficiency of the volleyball game actions
9.	Bondoc Ionescu Cristian	Modern orientations on kinetic methods to recover adult athletes
10.	Cosac George	Study regarding the unitary efficiency of the service return in tennis
11.	Dana Badau, Ramona Ungur, Adela Badau	Physical activity during students' free time -motivations and temptations
12.	Damian Cosmin, Damian Roxana, Damian Mirela	Balance development for primary school students through attractive methods
13.	Teslarasu Lenuta, Paraschiv Florin	Types of learning and handball training
14.	Paraschiv Florin, Teslarasu Lenuta	Sportsman's personality and the activity of selection
15.	Miloš Popović, Hana Valkova, Ružena Popović, Milan Dolga	Gender differences in Physical Fitness Test (PFT) of elementary and secondary school students with snique needs
16.	Ivana Đorđević, Ružena Popović	Determinants of physical activity in older people
17.	Mehmet Günay, Pelin Aksen Cengizhan, Mehmet Ozsari	The determination of physical activity levels of trainers in Kastamonu, Turkey
18.	Jana Juříková, Martina Šitinová	The influence of physical activity on body weight
19.	Drago Milošević, Danijela Bulatović	Zavisnost situaciono-motoričkih sposobnosti vaterpolista kadetskog uzrasta od morfoloških karakteristika
20.	Milena Strachová, Jana Juříková	Transformation of sports movement in the Czech Republic (1989 – 1992)
21.	Theodoros M. Bampouras, Adam Hargreaves	Anthropometric and physiological characteristics of elite Karateka: a case study

NAPOMENA NAUČNOG ODBORA

Tradicionalno, svake godine, povodom **Dana Fakulteta sporta i fizičkog vaspitanja Univerziteta u Beogradu** (11. decembra), nastavnici i saradnici Fakulteta organizuju naučnu Konferenciju, i tematski analiziraju neki od aspekata fizičke kulture. Kao i prošle godine (2011.) i ove godine izabrani nastavnici će se naći u ulozi domaćina naučne Konferencije, a tema koju smo oglasili pre godinu dana posvećena je:

„EFEKTIMA PRIMENE FIZIČKE AKTIVNOSTI NA ANTROPOLOŠKI STATUS DECE, OMLADINE I ODRASLIH“

Naime, na osnovu odluke Nastavno-naučnog veća u periodu od četiri godine, a počevši od 2011. godine, Naučni skup će nositi isti naslov i on će tematski biti posvećen istraživačkom projektu pod naslovom: *„Efekti primene fizičke aktivnosti na lokomotorni, metabolički, psihosocijalni i vaspitni status populacije Republike Srbije“*. Ovaj projekat je Fakultetu sporta i fizičkog vaspitanja Univerziteta u Beogradu, odobrilo Ministarstvo prosvete i nauke Republike Srbije na konkursu za sufinansiranje integralnih i interdisciplinarnih istraživanja za period 2011-2014. godine (Evidencioni broj projekta: 47015). Isticanje ovog podatka ima veliki značaj za nastavnike i saradnike sa našeg Fakulteta koji učestvuju u realizaciji ovog projekta, uz interdisciplinarnu saradnju sa istraživačima sa nekoliko institucija koje sa FSFV učestvuju u realizaciji ovog značajnog projekta (Fakultet za specijalnu edukaciju i rehabilitaciju Univerziteta u Beogradu i Kriminalističko-policijska akademija iz Beograda).

Naučni odbor je, prema kriterijumima koji su raspisani u pozivu za Međunarodnu naučnu konferenciju, prihvatio rezimee radova na srpskom i engleskom jeziku u izvornoj formi koju su autori dostavili. U pripremanju Zbornika sažetaka, u svim radovima je izvršena unifikacija personalnih podataka i metodološka struktura rada.

Naše je zadovoljstvo da Vas obavestimo da se pozivu za ovogodišnji skup odazvao veliki broj naučnih radnika, istraživača, profesora fizičkog vaspitanja i studenata doktorskih studija a u zborniku sažetaka će biti publikovani abstrakti iz 10 evropskih država i to: Srbije (56), Rumunije (15), Slovenije (5), Bosne i Hercegovine (5), Hrvatske (4), Makedonije (2), Bugarske (1), Grčke (2), Španije (1) i Velike Britanije (1). Ukupno će u zborniku sažetaka biti publikovano 92 abstrakta.

Svim autorima želimo uspešnu prezentaciju radova, razmenu stručnih i naučnih iskustava, uz prijatan boravak u Beogradu i na Fakultetu sporta i fizičkog vaspitanja Univerziteta u Beogradu.

Predsednik Naučnog odbora
Prof. dr Milivoj Dopsaj

SCIENTIFIC BOARD NOTE

Traditionally, every year to mark the Anniversary of the Faculty of Sport and Physical Education of the University of Belgrade (11th December), the professors and associates of the Faculty organize a scientific conference and thematically analyze some aspects of physical culture. As well as last year (2011), this year the selected teachers host the Scientific Conference and a year ago we announced that the topic of this year would be:

“EFFECTS OF PHYSICAL ACTIVITY APPLICATION TO ANTHROPOLOGICAL STATUS WITH CHILDREN, YOUTH AND ADULTS“

Namely, based on the decision of the Teaching-Scientific Council in the period of four years, starting from 2011, the scientific meeting shall have the same topic and it will be dedicated to the scientific project entitled:” The effects of physical activity application to locomotor, metabolic, psycho social and educational status of population of the Republic of Serbia.” This project was awarded to the Faculty of Sport and Physical Education of the University of Belgrade by the Ministry of Science and Education of the Republic of Serbia after the bidding procedure opened for co-financing of integral and interdisciplinary research for the period from 2011-2014 (the project record no. 47015). These data play a vital importance for teachers and associates of our Faculty who, in interdisciplinary cooperation with researchers from several institutions, take part in realization of this very important project. (Faculty for Special Education and Rehabilitation of the University of Belgrade and Academy of Criminalistics and Police Studies, Belgrade).

According to the criteria set out in the invitation to the International Scientific Conference, the Scientific Board accepted the abstracts in both Serbian and English language in their original form as submitted by the authors. In preparation of the Book of Abstracts, all the papers have been unified as for the personal data and methodological structure of the paper.

We have a pleasure to inform You that this year, great number of scholars, researchers, PE professors and Ph.D. students applied for participation, and in the Book of Abstracts, the abstracts from 10 European states will be published and they are: Serbia (56), Romania (15), Slovenia (5), Bosnia and Herzegovina (5), Croatia (4), Macedonia (2), Bulgaria (1), Greece (2), Spain (1) and the UK (1). The total of 92 abstracts will be published in the Book of Abstracts.

We wish all the authors a successful presentation of their papers, exchange of professional and scientific experiences and pleasant stay in Belgrade and at the Faculty of Sport and Physical Education of the University of Belgrade.

President of the Scientific Board
Prof. Milivoj Dopsaj, Ph.D.

UVODNA PREDAVANJA

INVITED LECTURERS

FIZIČKA NEAKTIVNOST/AKTIVNOST I GOJAZNOST – CAUSA SINE QUA NON

Jagoda Jorga

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Uvod

Gojaznost je bolest uvećanog, disfunkcionalnog masnog tkiva. U celom svetu pa i kod nas poprimila je odlike epidemije i to kako među odraslima tako i među decom i adolescentima. U Evropi je procenat onih koji pate od viška kilograma dostigao 60 %, dok se kod nas taj broj kreće oko 54 %.

Metod

Korišćenje dokaza iz multicentričnih meta analiza, visoko pouzdanih randomiziranih studija i dobro dizajniranih istraživanja zdravlja o gojaznosti i fizičkoj aktivnosti u svetu.

Rezultati sa diskusijom

Gojaznost je kompleksna bolest u čijem nastanku nesumljivo mesto imaju genetski faktori ali se oni, izuzev kod retkih monogenetskih oblika, neće ispoljiti bez sadejstva faktora „Obezogenog životnog okruženja“. Među tim faktorima posebno su važni način ishrane i fizička neaktivnost, pri čemu je godinama prevladavao stav da je prekomerni unos energetske bogate hrane /masti, šećeri/ najvažniji faktor. U poslednjoj deceniji sve je više kvalitetnih dokaza da je fizička neaktivnost, sedentarni stil života, čak i mnogo važniji promotor epidemije gojaznosti i među odraslima, a posebno decom, izražereno kao sedenje u slobodnom vremenu, vreme provedeno pred televizorom, kompjuterima i slično. Drugo ne manje važno pitanje tiče se efekata fizičke aktivnosti u okviru programa redukcije telesne težine. U svim vodičima za lečenje, fizička aktivnost je nezaobilazni element programa redukcije težine. Analiza dobro dizajniranih, dugoročnih studija pokazala je da primena fizičkog vežbanja bez dijetske intervencije ne vodi ka dovoljnom i značajnom gubitku u težini, ali da fizička aktivnost uz hipokalorijsku dijetu veoma efikasno čuva mišićnu masu tela što je značajan preduslov za dugoročni uspeh i prevenciju relapsa. Takođe je pokazano da je za dugoročno održavanje novodostignute težine neophodna značajna i redovna sportsko rekreativna aktivnost. Kad se kaže značajna, misli se i na intenzitet i na trajanje i frekvenciju. Tako se pokazalo da intenzitet treba da se kreće od 60 do 75 % maksimalnog aerobnog kapaciteta te da nedeljno bude najmanje 240 minuta s tim da je najbolje da to bude većina dana u nedelji.

Zaključak

Fizička neaktivnost je jedan od osnovnih etioloških faktora širenja epidemije gojaznosti u svetu, te je neophodan novi pristup kako u prevenciji, tako i u lečenju gojaznosti i među decom i među odraslima.

Cljučne reči: fizička neaktivnost/aktivnost, gojaznost

Literatura

1. WHO. (2000). *Obesity: Preventing and Managing the Global Epidemic Report of a WHO Consultation*. Technical Report Series.
2. Management of Obesity in Adults. (2008). European Clinical Practice Guidelines. *Obesity Facts*, 1, 106–116.

PHYSICAL INACTIVITY/ACTIVITY AND OBESITY – CAUSA SINE QUA NON

Jagoda Jorga

University of Belgrade, School of Medicine, Belgrade, Serbia

Introduction

Obesity is a disease of enlarged, dysfunctional adipose tissue. It has acquired epidemic proportions both globally and locally in Serbia, in adults as well as adolescents. The share of overweight adults in total population in Europe is circa 60%, and in Serbia over 54%.

Method

Multicentric meta analyses data, well-designed randomized clinical trials and health surveys targeting obesity and physical activity.

Results and discussion

Obesity is a complex disease, with genetic factors undoubtedly involved in its etiology. However, apart from some rare monogenetic forms, it will not manifest outside the so-called obesogenic environment. The most important environmental factors are diet and physical inactivity. For many decades it was assumed that high energy intake in form of high fat/high sugar diet was the key factor. During the last decade, robust evidence has emerged establishing that physical inactivity, particularly sedentary type of life, is a lot more important in promoting obesity epidemic in adults and even more in children. It is often expressed as time spent sitting, television viewing, sitting in front of a computer etc. The other, not less important, question concerns effects of physical activity on weight reduction in obese population. In all international guidelines on obesity treatment, physical activity is the essential part of weight management. Meta analyses of well-designed, long term studies have shown that physical activity alone without hypocaloric diet does not produce substitutional effect. However, combined with diet, it crucial to the long-term success of losing weight and relapse prevention. For weight maintenance, substantial physical activity has emerged as *causa sine qua non*, both in terms of intensity and total amount. In terms of intensity it should be between 50-75 % of maximal aerobic capacity, with an accumulated time of 240 minutes per week, preferably spread across most days of the week.

Conclusion

Physical inactivity is one of key factors in the global epidemic of obesity, necessitating a new approach to both prevention and treatment.

Key words: physical inactivity/activity, obesity

References

1. WHO. (2000). *Obesity: Preventing and Managing the Global Epidemic Report of a WHO Consultation*. Technical Report Series.
2. Management of Obesity in Adults. (2008). European Clinical Practice Guidelines. *Obesity Facts*, 1, 106–116.

OLIMPIJSKI PROGRAMI – SISTEM INOVACIJA U SPORTU SRBIJE

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Uvod

Olimpijski komitet Srbije (OKS) od 2006. godine realizuje olimpijske programe (OP) koji sadrže projektno upravljanje razvoja vrhunskog sportskog rezultata na putu učešća na olimpijskim igrama (OI). Cilj OP je izgradnja učinkovite sportske organizacije, kao i razvoj celine sistema sporta Srbije.

Metod rada

U procesu saznanja i na putu dolaska do zaključaka o realizovanim OP korišćene su metode refleksije, SWOT analize i benčmarkinga. Navedene metode se koriste u istraživanjima prirode fenomena, znanja i iskustva koja su povezana sa tim fenomenom. Koriste se u traganju za kontekstom nove – efikasnije prakse.

Rezultati i diskusija

Olimpijski programi su inovacija u delu sportskog proizvoda (rezultat, tim, učešća na olimpijskim igrama), procesa (primena novih tehnologija) i afirmaciji postojećih i stvaranju novih - olimpijskih vrednosti. Post-olimpijska evaluacija izdvaja kognitivni i aksiološki subprostor kao inovativni kvalitet realizovanih OP.

Zaključak

Olimpijski programi su inovaciona strategija upravljanja promenama i kontinuiranim adaptacijama svih činilaca u izgradnji vrhunskog sportskog rezultata i učešća na OI. Menadžment kulture svih aktera OP nameće se kao *conditio sine qua non* u izradi strategije OKS za naredne igre, razvoj i odnose u olimpijskom pokretu Srbije

Ključne reči: olimpijski programi, upravljanje, Olimpijske igre London, post-olimpijska evaluacija

Reference

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SEKCIJA 1

**TEORIJSKO-FILOZOFSKI ASPEKTI ISTRAŽIVANJA
EFEKATA PRIMENE FIZIČKIH AKTIVNOSTI U FIZIČKOM VASPITANJU,
SPORTU I REKREACIJI**

SESSION 1

**THEORETICAL-PHYLOSOPHICAL ASPECTS
OF THE EFFECTS OF PHYSICAL ACTIVITY APPLICATION IN PE,
SPORT AND RECREATION**

LINKING OF SOCIAL AND CULTURAL IDENTITY THROUGH TRADITIONAL DANCES TEACHING

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Introduction

Dance is the oldest way of expressing feelings of people. It is considered a form of art that appeared in all societies and cultures. Expresses the emotions of people, and their relationship to nature. Descriptions of the dances can be found in the ancient texts of Homer, Plutarch, Xenophon and Lucian. Dancing in cultural events can automatically operate as an event that is based on traditional dance. Teaching traditional dance by PE teachers is based on the idea that students are able to learn through traditional dances, about other elements of folk art, about folk costumes, traditional musical instruments, songs, and customs and to assert historical value of cultural traditions and heritage.

Method

In this study, a survey was done of attitudes of physical education teachers about their preferences for traditional dances that they chose to teach their students next school year. They were also asked to justify their selection of dances. The survey was conducted at Aegean island of Chios. 55 teachers participated in the survey, of which 25 women (39.6 yrs.) and 30 men (42.6 yrs.). Teachers were given a questionnaire in which they recorded all prefectures in Greece and local dances. Processing of the results was performed by SPSS.

Results and discussion

The results showed that teachers, both men and women, chose to teach students traditional dances and songs from the area of Aegean Sea.

Conclusion

Physical education teachers on the basis of their knowledge, the cultural identity of local communities, the wealth of traditional songs and dances have decided to learn traditional dances from the region of the Aegean Sea. In this way it has been proven that through physical education we can keep cultural ties and preserve cultural and social identity through learning and transmission of traditional dances in local communities!

Key words: identity, teaching, traditional dances

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THE PHYSICAL EDUCATION TEACHER AS A PRINCIPAL AND THE IDENTIFICATION OF THE NEED TO IMPROVE ADMINISTRATIVE COMPETENCE WITH A VIEW TO AN EFFECTIVE SCHOOL

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Introduction

The purpose of the present paper is to identify which administrative skills of the physical education teachers (PET) need improvement, so as the latter to be considered effective managers according to their teachers' perceptions. Making use of the gap analysis technique, the research focuses on the factors teachers consider effective for a school Principal, and whether or not these factors are characterize their Principals.

Method

The search for an effective Principal went through successive stages. Guided by the general question "how does the Principal contribute to the operation of the school", there has been an attempt to clarify the relationship between the Principal's behaviour and specific criteria of efficiency, using as indicators of the Principal's effectiveness, the teachers' perception on the school management or their degree of job satisfaction. For this reason, several researches abroad have explored the teachers' perception as a process of identifying the Principals' quality of school leadership and administrative competence (1, 2).

Results and discussion

The participants were 112 teachers in 5 schools run by physical education teachers (PET) who filled in a questionnaire (Principal Instructional Management Rating Scale-PIMRS) adapted to the Greek reality. The results were statistically significant in all the questions comprised in the measurement tool. The first three abilities/skills lacking and should be developed by Principals are the following: "working with multilingual parent groups" with a mean difference of 0.75 ($t_{(112)}=14.649$ $p=0.000$); the "conversion of the curriculum objectives into a curriculum on the school's website" with a mean difference of 0.73 ($t_{(112)}=12.859$ $p=0.000$); and "informing of parents on their children's educational advance" ($t_{(112)}=10.117$ $p=0.000$).

Conclusion

Teachers do not experience the leadership behaviours they expect from the Principal and their Principals' abilities/ skills exhibited are not the ones expected. In addition, according to teachers, the Principal's effectiveness depends on the establishment of a welcoming environment for students and teachers, as well as the development of a clear educational policy and its dispersion. As concerning the Principals' behaviours and skills, no transformational and educational leaders' behaviours were identified. The abilities/skills identified refer to a Principal who is an Administrator and Manager with a hue of a Participative and Competent leader.

Key words: school principal, school effectiveness, physical education teacher (PET), secondary education

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IMPACT OF CULTURAL ENVIRONMENT ON PHYSICAL ACTIVITY OF CHILDREN

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Introduction

Multi-center study was conducted to objectively evaluate physical activity (PA) patterns and estimate energy expenditure in 11-year-old children from three cities of Central Europe and Midwest of United States of America.

Method

The sample consisted of 241 children (116 boys, 125 girls), mean age SD = 11.4±0.4 years. Energy expenditure and PA were assessed during two weekdays and two weekend days using a multiple-sensor body monitor (SenseWear Armband; BodyMedia Inc., Pittsburgh, PA, USA).

Results and discussion

Except of total energy expenditure in all measured variable of PA differences between city groups were observed. The highest level of moderate to vigorous PA was noted in Ljubljana boys (284±99 min/day) and the lowest in Zagreb girls (179±95 min/day). Recent accelerometry based studies reported somewhat lower values of daily PA (1, 2, 3). Zagreb and Ljubljana children had similar PA level pattern. Boys were more physically active than girls in all PA levels, while in sedentary behaviour there is no difference. In Ann Arbor different pattern was noticed. Girls were more physically active than boys. A decline in PA from weekdays to weekends was noted in all city groups in both genders. In all three city groups the great majority of children of both genders achieved current recommended 60 min of moderate to vigorous PA either during weekdays or weekend days.

Conclusion

The knowledge about PA of particular children is very important for planning of interventions aiming to promote increased levels of PA in children. Weekend days seem appropriate target when promoting PA in studied city groups in order to increase the PA level. Current recommendations of daily PA for children and adolescent should be taken under revision, since they cannot be used universally.

Key words: public health, school health education, inactivity, energy expenditure, activity patterns

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ORIJENTIRING KARTE ZA POTREBE NASTAVE FIZIČKOG VASPITANJA¹

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Uvod

Osnovni rekvizit u orijentiringu je orijentiring karta kao vrsta tematske topografske karte krupnog razmera i konstruisani znakovni model određenog geoprostora po međunarodnim standardima i prema projektovanoj nameni (3). Orijetiring, kao fizička aktivnost, može u velikoj meri da odgovori zahtevima nastave fizičkog vaspitanja u školi. Analizirana i sistematizovana iskustva iz dosadašnjih projekata škola orijentiringa (1, 2) i Pravilnika za izradu orijentiring karata Orijetiring saveza Srbije ukazuju na potrebu obezbeđenja pretpostavki za izvođenje orijentiringa u nastavi i vančasovnim aktivnostima. S tim u vezi, cilj rada je da se ukaže na procedure izrade i publikovanja orijentiring karata, načine izrade „prigodnih orijentiring karata“ školskih prostorija, školskog dvorišta i okolnog geoprostora, kao i načine primene orijentiring karata u realizaciji programa nastave fizičkog vaspitanja.

Metod

U radu je primenjen metod analize sadržaja referentne literature i legislative iz tretirane tematike, kao i deskriptivni metod za prikazivanje načina primene orijentiring karata u realizaciji programa nastave fizičkog vaspitanja.

Rezultati sa diskusijom

Na osnovu analize referentne literature, legislative iz tretirane tematike, kao i sagledavanja prostornih mogućnosti za potrebe izvođenja orijentiringa u nastavi fizičkog vaspitanja predlaže se korišćenje različitih vrsti karata: od planova učionica, jednostavnih crteža sale ili školskog dvorišta, preko namenski urađenih karata za obuku (razmere 1:500 do 1:2500), park-karata (1:5000) i regularnih takmičarskih karata (1:10000). Ovako pripremljene karte omogućuju primenu orijentiringa u učionici, sali, školskom dvorištu, sportskom centru, parku, obližnjoj šumi, uz optimalni nivo praktičnih i teorijskih znanja o orijentiringu i odgovarajućih metoda rada.

Zaključak

Prezentovane instruktivne odrednice u radu mogu pomoći nastavnicima fizičkog vaspitanja, kao i geografije i razredne nastave, da sigurnije i lakše obezbede i primenjuju orijentiring karte. Stručna izrada i umešno korišćenje orijentiring karata projektovane namene doprineće primeni programa iz orijentiringa u nastavi fizičkog vaspitanja i dalji razvoj orijentiringa kao školskog sporta.

Ključne reči: orijentiring karta, nastava, fizičko vaspitanje

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ORIENTEERING MAPS IN PHYSICAL EDUCATION

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Introduction

The main prop in orienteering is an orienteering map as a kind of thematic topographic maps of large-scale and constructed model of geographic space per international standards and according to the designed purpose (3). Orienteering, as well as physical activity, can greatly meet the requirements of physical education at school. Analyzed and systematized experience of previous projects, schools orienteering (1, 2) and Rules for making orienteering maps of the Orienteering Association of Serbia indicate the need for security requirements for performance orienteering in school and as extracurricular activities. In this regard, the aim of this paper is to highlight the procedure of the production and publication of orienteering maps, ways of making "appropriate orienteering maps" school premises, the school yard and surrounding geographic space, as well as ways to use orienteering maps in the program of physical education.

Method

In this paper, a method of analysis of scientific content and the legislation issues was used, as well as descriptive method to display the application of orienteering maps in the program of physical education.

Results and discussion

Based on the analysis of scientific content of the referent references, on the issues in the legislation, as well as the perception of spatial features for performance of orienteering in physical education suggests the use of different types of maps: from classroom plans, simple drawings of sports hall or the school yard, through dedicated maps for training (scale 1:500 to 1:2500), park maps (1:5000) and regular competitive maps (1:10000). Thus prepared orienteering maps allow the application in the classroom, gym, school yard, sports centers, parks, nearby woods, the optimal level of practical and theoretical knowledge of orienteering and related methods.

Conclusion

Instructional guidelines presented in this paper can help teachers of physical education, geography and a school teachers, to ensure safer and easier application of orienteering maps. Professional design and skillful use of orienteering maps and designed purpose will contribute to programs of orienteering in physical education and further development of orienteering as a school sport.

Key words: orienteering map, instruction, physical education

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SPELEOLOGIJA KAO OBLIK FIZIČKE AKTIVNOSTI

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Uvod

Speleologija (pećinarenje) se definiše kao interdisciplinarna naučno - sportska disciplina koja se bavi istraživanjem različitih podzemnih objekata (jama, pećina, katakombi, rudnika). Pravilnikom Ministarstva omladine i sporta je prepoznata kao specifična i kompleksna sportska veština, koja pripada grupi tzv. ekstremnih sportova. Jedan od preduslova za bavljenje ovom veštinom podrazumeva odgovarajući nivo opšte fizičke pripremljenosti. U stručnoj literaturi postoji mali broj informacija o speleologiji sa aspekta fizičke aktivnosti.

Metod

Korišćen je metod teorijske analize dostupne stručne literature koja se bavi analizom speleologije kao oblikom fizičke aktivnosti.

Rezultati sa diskusijom

Bavljenje speleologijom podrazumeva podnošenje dugotrajnih fizičkih napora, na otvorenom i u podzemnim uslovima sa čestom promenom uslova pri ulasku u objekat (nadmorska visina, temperatura, vlažnost vazduha). Može se uporediti sa alpinizmom, osim što je za speleologiju potrebno poznavati i različite speleološke tehnike. Od fizičkih sposobnosti aerobna izdržljivost je najvažnija, ali do izražaja dolaze snaga i fleksibilnost, koje se mogu razvijati u terenskim uslovima, karakterističnim za bavljenje speleologijom, kao i u uslovima simulacije karakterističnih načina kretanja na različitim trenažerima. Podrazumeva takmičenje sa prirodom i samim sobom, ispitivanje sopstvenih granica. Zahteva timski rad, poštovanje speleoloških i sportskih pravila i načela. Pored registrovanog saveza, postoje i rekreativni vidovi bavljenja ovom veštinom. Kao grana turizma u toku poslednje decenije razvija se speleo-turizam.

Zaključak

Kroz istraživanja speleologije sa aspekta fizičke aktivnosti unaprediće se mogući načini fizičke pripreme i razviti modeli treninga. Na taj način će se ova veština približiti većem broju korisnika, prvenstveno za potrebe rekreacije.

Ključne reči: speleologija, fizička aktivnost

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CAVING AS A FORM OF PHYSICAL ACTIVITY

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Introduction

Caving is defined as an interdisciplinary science - sports discipline engaged in research of various underground structures (pits, caves, and catacomb). By the Resolution of the Ministry of Youth and Sports it has been recognized as a specific and complex sports skill, which belongs to the so-called extreme sports. One of the prerequisites for practicing this skill is appropriate level of general fitness. In the References there is little information about spelunking in terms of physical activity.

Method

The method of theoretical analysis of available references dealing with the analysis of caving as a form of physical activity was used in this research.

Results and discussion

Dealing caving involves submitting lengthy physical exertion, outdoors and in subterranean conditions with frequent changes in conditions at the entrance to the different structures (altitude, temperature, humidity). It can be compared to mountain climbing, except it is necessary to know different caving techniques. From physical abilities aerobic endurance is the most important, but power and flexibility that can be developed under field conditions are also expressed, typical for dealing with caving, as well as in terms of the simulation of characteristic ways of moving at various gyms. It involves competition with nature and themselves, testing their own boundaries; requires teamwork, respect caves and sporting rules and principles. In addition to the registered associations, and recreational aspects are practicing this skill. As the tourism industry in the past decade developing caving tourism.

Conclusion

Through research of caving in terms of physical activity, possible ways to improve the physical preparation and develop training modules will be improved. In this way, this skill will bring more customers, primarily for recreation.

Key words: caving, physical activity

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SEKCIJA 2

**ISTRAŽIVAČKO-METODOLOŠKI EFEKATA PRIMENE FIZIČKIH
AKTIVNOSTI U FIZIČKOM VASPITANJU, SPORTU I REKREACIJI**

SESSION 2

**RESEARCH-METHODOLOGICAL ASPECTS OF THE EFFECTS OF PHYSICAL
ACTIVITY APPLICATION IN PE, SPORT AND RECREATION**

EFEKTI PRIMENE MUZIKE NA FORMIRANJE STAVA UČENIKA PREMA FIZIČKOM VASPITANJU^{1, 2}

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Uvod

Pozitivni stavovi prema fizičkom vaspitanju predstavljaju važnu komponentu angažovanja učenika u nastavi i fizičkim aktivnostima van škole. Formiranju stava u velikoj meri mogu doprineti sadržaji i metode rada na časovima. Cilj istraživanja bio je provera uticaja eksperimentalnog programa „Uključenost muzike u nastavu fizičkog vaspitanja“ na formiranje stava učenika prema fizičkom vaspitanju.

Metod

Uzorak je činio 141 učenika sedmog razreda osnovne škole. U istraživanju je primenjen eksperiment sa paralelnim grupama (eksperimentalna grupa - 61 učenik, kontrolna grupa - 80 učenika). Na inicijalnom testiranju primenjena su dva instrumenta za merenje stavova i upitnik o polu, oceni iz fizičkog vaspitanja i bavljenju učenika muzikom. Upitnik Student's Attitudes Toward Physical Education sadrži 20 tvrdnji koje su grupisane u dve subskale: zadovoljstvo i opažena korisnost. Instrument Konotativni diferencijal obuhvata 15 skala procene koje su grupisane u tri subskale: afektivnu, konativnu i kognitivnu. Nakon inicijalnog testiranja u eksperimentalnoj grupi je primenjen program „Uključenost muzike u nastavu fizičkog vaspitanja“ u trajanju od 18 časova, dok su u kontrolnoj grupi obrađivane iste nastavne jedinice bez muzike. Na završnom testiranju u obe grupe primenjena su oba instrumenta o stavovima, a u eksperimentalnoj grupi je primenjen i dodatni upitnik o doživljaju časova sa i bez muzike.

Rezultati sa diskusijom

Rezultati su pokazali da učenici na inicijalnom testiranju imaju pozitivne stavove prema fizičkom vaspitanju mereno sa oba instrumenta. T-test je pokazao da eksperimentalna grupa ima statistički značajno veće skorove na završnom testiranju u odnosu na inicijalno na subskalama Konotativnog diferencijala koje mere konativnu ($t_{(139)} = 2.74, p < 0.01$) i kognitivnu komponentu stava ($t_{(139)} = 2.69, p < 0.01$), odnosno da je došlo do promene stava u pozitivnom smeru. MANOVA je pokazala da ova promena nije povezana sa polom, ocenom iz fizičkog vaspitanja i bavljenjem muzikom. Rezultati t-testa pokazuju da učenici pozitivnije procenju časove sa muzikom u odnosu na časove bez muzike, mereno dodatnim upitnikom.

Zaključak

Na osnovu dobijenih rezultata može se zaključiti da je eksperimentalni program uticao na formiranje stava učenika prema fizičkom vaspitanju u pozitivnom smeru i to na njegov motivacioni i sazajni aspekt.

Ključne reči: stavovi, muzika, fizičko vaspitanje, učenici

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² Rad je deo Projekta „Identifikacija, merenje i razvoj kognitivnih i emocionalnih kompetencija važnih društvu orijentisanom na evropske integracije“ pod brojem 179018 koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

EFFECTS OF APPLICATION OF MUSIC ON FORMATION OF STUDENTS' ATTITUDE TOWARDS PHYSICAL EDUCATION

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Introduction

Positive attitudes towards physical education are an important component of students' engagement in classes and extracurricular physical activities. Contents and methods of class work can affect to a great extent the formation of such an attitude. The research was aimed at verifying the effects of the experimental program „Inclusion of music in PE classes“ on formation of students' attitude towards physical education.

Method

The sample consisted of 141 students attending 7th grade of elementary school. An experiment with parallel groups was applied in the research (experimental group - 61 students, control group - 80 students). Two instruments, measuring the attitudes, were applied at the initial testing as well as a questionnaire on gender, PE grade and involvement in music. The questionnaire Students' Attitudes toward Physical Education contains 20 statements grouped in two subscales: enjoyment and perceived usefulness. The Connotative differential instrument includes 15 evaluation scales grouped in three subscales: affective, conative and cognitive. After the initial testing, the experimental group underwent the program „Inclusion of music in PE classes“ at 18 classes while the control group had the same instruction units but without music. At the final testing both instruments on attitudes were implementing in both groups and the experimental group did an additional questionnaire on their experience of classes with and without music.

Results and Discussion

The results showed that students at the initial testing had positive attitudes towards physical education measured with both instruments. T-test indicated that the experimental group had statistically higher scores at the final testing compared to the initial at the subscales of *Connotative differential* which measure both connotative ($t_{(139)} = 2.74, p < 0.01$) and cognitive component of the attitude ($t_{(139)} = 2.69, p < 0.01$), i.e., whether a positive change of attitudes occurred. MANOVA showed that the change was not linked to gender, PE grade and involvement in music compared to classes without music, measured with an additional questionnaire.

Conclusion

Based on the obtained results it can be concluded that the experimental program affected formation of students' attitude towards physical education in positive direction, particularly on its motivational and cognitive aspect.

Key words: attitudes, music, physical education, students

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PROCENA AKTIVNOSTI UČENIKA I NASTAVNIKA NA ČASOVIMA FIZIČKOG VASPITANJA PRIMENOM INSTRUMENTA *SOFIT* U NEKIM GRADOVIMA SRBIJE¹

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Uvod

Predmet istraživanja u ovom radu je ukupna aktivnost nastavnika i učenika na času fizičkog vaspitanja u nekim gradovima Srbije. Osnovni cilj rada je bio primena instrumenta *SOFIT* na uzorku osnovnih i srednjih škola Beograda, Kraljeva, Bajine Bašte i Gornjeg Milanovca. Pošlo se od pretpostavke da će se primenom instrumenta *SOFIT* pored nekih opštih zakonitosti pokazati i određene specifičnosti u školama iz pomenutih gradova.

Metod

Primenjen je metod deskriptivne analize uz korišćenje objektivno prikupljenih podataka na časovima fizičkog vaspitanja uz primenu instrumenta *SOFIT*. Uzorak su činila dva poduzorka: poduzorak učenika osnovnih i srednjih škola iz četiri grada u Srbiji (n=1062) i poduzorak nastavnika (n=24). Podatke su prikupili obučeni posmatrači primenom skale procene *SOFIT* (2) tokom 60 školskih časova. Podaci su obrađeni osnovnom deskriptivnom statistikom i analizom varijanse (ANOVA), nakon čega je izvršena komparativna analiza dobijenih rezultata sa sličnim domaćim i stranim radovima.

Rezultati sa diskusijom

Rezultati istraživanja su pokazali da je prosečno aktivno vreme vežbanja učenika na svim časovima 17.6 min., a po gradovima - Beograd 19.2, Kraljevo 18.7, Bajina Bašta 15.5 i Gornji Milanovac 16.4, što je veća aktivnost učenika u odnosu na slična domaća istraživanja (1). Pored aktivnog vremena vežbanja učenika, instrumentom je posmatrana struktura časa, sadržaj časa i pedagoška aktivnost nastavnika. Što se sadržaja časa tiče, najviše vremena učenici su proveli u igri (12.2 min.), u organizaciji časa (11.6 min.), u vežbanju (8.4 min.) i u obučavanju i usavršavanju veština (3.4 min.). Nastavnik je najviše vremena proveo posmatrajući angažovanje učenika (12.9 min.), dajući informacije učenicima (12.4 min.), organizujući čas (6.9 min.), demonstrirajući (2.6 min.) i bodreći učenike (1.6 min.). Rezultati vezani za sadržaj časa i aktivnost nastavnika su slični sa rezultatima koji su dobili strani autori primenjujući ovaj instrument (2). Ono što se javlja kao specifičnost u rezultatima koji su dobijeni na uzorku ispitivanih škola, jeste pojava statističke značajnosti u rezultatima aktivnog vremena vežbanja između ispitivanih škola u navedenim gradovima. Primenom analize varijanse (ANOVA) konstatovano je sledeće: $F_{(3,56)} = 5.021$; $p < 0.01$. Uz naknadnu primenom LSD post-hoc testa, konstatovano je postojanje razlika između ukupne aktivnosti učenika iz Beograda u poređenju sa učenicima iz Bajine Bašte i Gornjeg Milanovca, kao i između učenika iz Kraljeva i Bajine Bašte.

Zaključak

U odnosu na prethodno istraživanje (1), primenom instrumenta *SOFIT* na većem uzorku škola i ispitanika, pokazane su statistički značajne razlike u aktivnosti učenika u ispitivanim gradovima. Istraživanja u tom smislu treba nastaviti, jer se pokazuju tendencije objektivizacije dobijenih podataka sa rastom uzorka na kome se istraživanje vrši.

Ključne reči: učenici, nastavnici, fizičko vaspitanje, *SOFIT*

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¹ Rad je deo Projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije R. Srbije” pod brojem III47015, a kao deo potprojekta “Efekti primenjene fizičke aktivnosti na lokomotorni metabolički psiho-socijalni i vaspitni status školske omladine R. Srbije” koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

ASSESSMENT OF STUDENTS AND TEACHERS' ACTIVITY IN PHYSICAL EDUCATION CLASSES IN SOME SERBIAN CITIES BY THE APPLICATION OF *SOFIT* INSTRUMENT

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Introduction

The research subject in this paper is the total activity of teachers and students in physical education classes in some Serbian cities. The main goal of the paper was the application of the *SOFIT* instrument on a sample of primary and secondary schools in Belgrade, Kraljevo, Bajina Bašta and Gornji Milanovac. The starting premise was that the application of the *SOFIT* instrument will show certain specificities in the schools of said cities, aside from some general rules.

Method

The applied method was descriptive analysis, with using objectively gathered data on physical education classes by applying the *SOFIT* instrument. The sample consisted of two subsamples: primary and secondary school students from four Serbian cities' subsample (n=1062) and teacher subsample (n=24). Data were gathered by trained observers applying the *SOFIT* estimation scale (2) during the course of 60 classes. Data were processed by descriptive statistics and variance analysis (ANOVA), after which a comparative analysis was conducted, comparing the received results with similar domestic and foreign papers.

Results and discussion

Research results showed that the average active exercise time of students in all classes was 17.6 min., with particular cities' results being - Belgrade 19.2, Kraljevo 18.7, Bajina Bašta 15.5 and Gornji Milanovac 16.4, which is a higher student activity when compared to similar domestic researches (1). Aside from students' active exercise time, the instrument was used in observing class structure, class content and teacher's pedagogical activity. As for the class content, students spent most time playing (12.2 min), organizing the class (11.6 min), practicing (8.4 min) and in training and improvement of skills (3.4 min). The teacher spent most time observing the students' activities (12.9 min), giving out information to students (12.4 min), organizing the class (6.9 min), demonstrating (2.6 min) and encouraging the students (1.6 min). Results related to class content and teacher activity are similar to the ones obtained by foreign authors who applied this instrument (2). The thing that occurs as a specificity in the results obtained from the tested schools' samples is the occurrence of statistical significance in the results of active exercise time among the tested schools in said cities. By applying the variance analysis (ANOVA) the following was determined: $F_{(3,56)} = 5.021$; $p < 0.01$. Through an additional application of LSD post-hoc test a difference between the total activity of Belgrade students and students from Bajina Bašta and Gornji Milanovac was ascertained, as well as a difference between students from Kraljevo and Bajina Bašta.

Conclusion

When compared to a previous research (1), statistically significant differences in student activity in tested cities were revealed by applying the *SOFIT* instrument on a bigger sample of schools and subjects. With that in mind the researches should be continued, because there is a tendency of objectivization of acquired data stemming from the increase in samples on which the research is carried out.

Key words: students, teachers, physical education *SOFIT*

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DA LI KVALITET ŽIVOTA I FIZIČKE SPOSOBNOSTI ZAVISE OD NIVOVA FIZIČKE AKTIVNOSTI KOD STARIH MUŠKARACA?

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Uvod

Prema podacima Ujedinjenih Nacija, broj osoba starijih od 60 godina povećao se za 2 % od 1950. do 2000. (sa 8% na 10% ukupnog stanovništva), međutim predviđa se da će broj starih osoba 2050 godine biti čak 22% ukupnog stanovništva. Potvrđeno je da su starije osobe manje fizički aktivne u odnosu na ostalu populaciju što ako povežemo sa zdravstvenim statusom može predstavljati problem s obzirom da je broj starih osoba u stalnom porastu i da predstavlja demografsku karakteristiku savremenog društva u čitavom svetu. Cilj ovog rada bio je da se utvrdi da li kvalitet života i fizičke sposobnosti zavise od nivoa fizičke aktivnosti kod muškaraca starijih od 60 godina. Predpostavili smo da će osobe koje su fizički aktivnije imati bolje funkcionalne sposobnosti i bolji stav o kvalitetu njihovog života.

Metod

Istraživanje je sprovedeno na ukupnom uzorku od 666 ispitanika. Kriterijumi za uključivanje u studiji bili su: starosna dob između 60 i 80 godina, fizički nezavisne osobe sposobne da hodaju 20 metara bez asistencije ili odmora, nepostojanje kognitivnih smetnji i demencije, ostvarenih 24 poena za edukovane i 18 poena za needu-kovane ispitanike na Mini Mental State Evaluation (2). Istraživanje je odobreno od strane Etičke komisije FSFV Univerzitet u Nišu u skladu sa Helsinškom deklaracijom. Za potrebe ovog istraživanja korišćena je baterija testova koja se sastoji od 6 mera fizičkih sposobnosti: 1) pokretljivost ramena, 2) pretklon na stolici, 3) osam stopa, 4) ustajanje sa stolice za 30 sekundi, 4) fleksija u zglobu lakta, 5) dvominutni step test. Samoprocena fizičke aktivnosti ispitanika izvršena je na srpskoj verziji IPAQ upitnika. Kvalitet života je procenjen kraćom verzijom upitnika Svetske zdravstvene organizacije-WHOQoL (1). Za utvrđivanje razlike u kvalitetu života i fizičkih sposobnosti između nisko, umereno i visoko aktivnih starih muškaraca korišćena je univarijantna analiza varijanse (ANOVA).

Rezultati sa diskusijom

U skoro svim testiranim varijablama bilo je statistički značajne razlike između nisko, umereno i visoko aktivnih starih osoba. Kao i kod fizičkih sposobnosti i u parametrima kvaliteta života postoji statistički značajna razlika ($p < 0.05$) u većini posmatranih domena između nisko, umereno i visoko aktivnih ispitanika. Ova studija je samo potvrdila naše pretpostavke da fizički aktivniji muškarci stariji od 60 godina imaju bolje stavove prema kvalitetu njihovog života ali i bolje pokazatelje fizičkih sposobnosti. Nivo fizičke aktivnosti direktno je povezan sa održavanjem ili povećanjem funkcionalnih sposobnosti a u tom procesu bilo koja vrsta fizičke aktivnosti je bolja od neaktivnosti.

Zaključak

Na osnovu ove studije možemo da zaključimo da smanjen nivo fizičke aktivnosti dovodi do pada funkcionalnih sposobnosti i nižeg stava o kvalitetu života muškaraca starijih od 60 godina.

Cljučne reči: kvalitet života, fizička aktivnost, fizičke sposobnosti, starije osobe

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DOES QUALITY OF LIFE AND PHYSICAL FITNESS DEPEND ON PHYSICAL ACTIVITY LEVEL IN ELDERLY MEN?

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Introduction

According to the United Nations, number of persons older than 60 years has increased for 2% from 1950 to 2000 (from 8% to 10% of total population). However, it is expected that number of elderly people will increase to 22% of total population until 2050. It was confirmed that older people are less physically active compared to other population, which can be a problem if it is connected with health status since the number of older adults continues to increase. The aim of this study was to determine does quality of life and physical fitness depend on physical activity level among elderly men? We hypothesize that a physically more active person has better functional abilities and quality of life scores.

Method

The research was conducted on a sample of 666 participants. Criteria for selecting participants were: age between 60 and 80 years, physically independent person - able to walk 20 feet without assistance or rest, lack of cognitive impairment and dementia, achieved 24 points for the educated and 18 points for the unqualified respondents in mini mental state evaluation (2). The study was approved by the Research Ethics Committee of the Faculty of Physical Education and Sport, University in Nis and according to Declaration of Helsinki. Senior fitness test (SFT) battery was used for the aim of this study. SFT consists of six physical fitness measures: 1) Back scratch, 2) Chair sit and reach, 3) 8-foot up and go, 4) Chair stand up for 30 sec, 5) Arm curl, 6) 2-minutes step test. Self-evaluation of participant's physical activity was conducted according to Serbian version of IPAQ questionnaire. Quality of life was assessed with a short version WHOQoL questionnaire (1).

Results and discussion

In almost all tested variables of senior fitness test there was a statistically significant difference ($p < 0.05$) between low, moderate and vigorous active elderly people. Also, there were statistically significant differences in physical health, social relationship and environment domain. These results have confirmed that the level of physical activity is directly connected with the maintenance or increase of the physical fitness and in that process any kind of physical activity is better than inactivity.

Conclusion

In this study it has been concluded that the reduction of the physical activity level causes decrease of functional fitness and quality of life attitudes in elderly people over 60 years old.

Key words: quality of life, physical activity, physical fitness, elderly men

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RELACIJE IZMEĐU NEKIH ANTROPOLOŠKIH OBELEŽJA I OPŠTEG ŠKOLSKOG USPEHA KOD DECE MLAĐEG ŠKOLSKOG UZRASTA

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Uvod

Cilj istraživanja je bio da se ispita povezanost između nekih antropoloških obeležja i kognitivnih sposobnosti, odnosno uspeha u pojedinim nastavnim predmetima i celokupnom školskom uspehu. Uzorak je činilo 73 ispitanika, učenika osnovne škole „Jovan Jovanović Zmaj“ u Kanjiži. Hipoteza je bila da se pomoću ocena iz škole može utvrditi relacija između ta dva područja.

Metod

Na uzorku ispitanika za dobijanje relevantnih podataka koristili smo varijable: uspeh u školi, antropometrijske karakteristike, motoričke sposobnosti, funkcionalne sposobnosti. Za sve varijable izračunati su osnovni deskriptivni parametri: aritmetička sredina, standardna devijacija, modalna vrednost, te zakrivljenost i spljoštenost distribucije, normalnost distribucije testirana je Kolmogorov–Smirnov testom. Kao mera povezanosti posmatranih varijabli korišten je Pearsonov koeficijent korelacije ($p > 0.05$). Za utvrđivanje strukture posmatranog prostora korišćena je faktorska analiza.

Rezultati sa diskusijom

Iz osnovnih deskriptivnih parametara vidljivo je da je prosečna ocena iz opšteg uspeha svih učenika 4.6 sa modalnom vrednošću 5 koju je ukupno postiglo 63% učenika mlađeg školskog uzrasta. Izračunavanjem koeficijenta korelacije utvrđeno je kako nema statistički značajne korelacije između antropoloških obeležja i uspeha u školi, dok su značajne korelacije i to pozitivne, uočljive između ocena iz predmeta u školi i opšteg uspeha. Također je uočljivo kako su značajne korelacije među varijablama antropološkog prostora. Dakle, može se reći kako je grupisanje varijabli određeno s jedne strane, uspehom u školi i ocenama iz pojedinih predmeta, te antropološkim obeležjima s druge strane. Rezultati korelacija među dobijenim faktorima ukazuju kako nema statistički značajne korelacije ni među jednim faktorom, te se može utvrditi kako se u posmatranom prostoru sve tri dimenzije ponašaju nezavisno. Iako su rezultati prethodnih istraživanja utvrdili povezanost između antropološkog statusa, naročito motoričkih sposobnosti i kognitivnih dimenzija, u ovom istraživanju takva povezanost nije utvrđena. Iz ovih rezultata može se zaključiti kako je uspeh u školi determinisan isključivo uspehom iz ostalih predmeta, što je i logično, jer se povećanjem prosečne ocene iz pojedinog predmeta povećava i ukupna prosečna ocena.

Zaključak

Dobijena tri značajna faktora ukazuju na nezavisno funkcionisanje kognitivnih i antropoloških obeležja, što nije u skladu sa većinom dosadašnjih istraživanja i dovodi do zaključka kako su potrebna dodatna istraživanja ovog područja kako bi se shvatili svi faktori koji utiču na akademske rezultate. Iz ovih rezultata se može zaključiti kako i ocena u školi nije odgovarajući merni instrument za ovakva istraživanja, već se za procenu relacija između antropoloških karakteristika i kognitivnih sposobnosti moraju koristiti drugi merni instrumenti.

Ključne reči: antropološka obeležja, motoričke sposobnosti, merni instrumenti

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RELATIONS BETWEEN THE KINESTHETIC DIMENSIONS AND ACADEMIC PERFORMANCE OF YOUNGER SCHOOL AGE CHILDREN

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Introduction

The aim of the research was to examine the relationship between some anthropological attributes and cognitive abilities, in other words the success in some school subjects and the complete school results. The sample included 73 pupils from Jovan Jovanović Zmaj elementary school in Kanjiža. The hypothesis was that school marks can prove the relationship between the two areas.

Method

To analyse the relevant data we used the following variables: academic performance, anthropometric characteristics, motor abilities and functional abilities. Descriptive statistics was calculated for all variables: Mean, Standard deviation, Mode, Skewness and Kurtosis, normal distribution was tested with Kolmogorov–Smirnov test. To measure the relationship between the variables we used the Pearson coefficient of correlation ($p > 0.05$). To prove the structure of the observed areas we used factor analysis.

Results and discussion

From the basic descriptive parameters it is visible that the average appraisal of the common results of all pupils is 4.6 with the model value 5 achieved by the 63% of the pupils. The coefficient calculation of the correlation proved that there are not any statistically significant correlations between the anthropological characteristics and success at school, while the important correlations which are positive are noticeable between grades from school subjects and the complete school results. It is also noticeable that the correlations between the variables of anthropological attributes are also significant. We can say that grouping the variables together is definite with school results and grades from individual subjects on the one hand, and with the anthropological attributes on the other hand. The results of correlation among the received factors show that there are no statistically significant correlations among the factors, so we can assume that the observed areas are independent from each other. Although earlier research show, for instance, an existing relationship between anthropological status and school success, especially in motor abilities and cognitive dimension, however, in this research such kind of relationship was not found. From these results, we can conclude that school result is determined only by success from school subjects that is logical because since the average mark is growing as by the growth of average marks of each subject.

Conclusion

The three important factors that were obtained show the independent functioning of cognitive and anthropological attributes that is not in accordance with the most recent research and it leads us to the conclusion that further research are required in this field in order to make sense of all the factors that can affect academic results. From these results we can conclude that marks in school are not the appropriate instruments for such research, so for evaluation of the relation between anthropological characteristics and cognitive abilities other kinds of instruments must be developed.

Key words: anthropological attributes, motor abilities, instruments

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NIVOI TRANSFORMACIONIH PROMJENA MORFOLOŠKIH KARAKTERISTIKA ŽENA POD UTICAJEM RAZLIČITIH MODELA SPORTSKO-REKRATIVNIH AKTIVNOSTI¹

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Uvod

Savremeni/sjedeći čovjek izložen je različitim faktorima rizika koji ugrožavaju njegovo zdravlje. Da bi sačuvao i unaprijedio svoje zdravlje i radne sposobnosti, potrebno je da otkloni veći broj faktora rizika i primijeni redovne oblike fizičkih aktivnosti. Različiti modeli sportsko-rekrativnih aktivnosti mogu pozitivno uticati na cjelokupni antropološki status žena. Istraživanje je sprovedeno s ciljem utvrđivanja nivoa transformacije morfoloških karakteristika žena hronološke dobi od 35 do 45 godina pod uticajem tromjesečnog rekreativnog programa plivanja i aerobika.

Metod

Uzorak rekreativki iz Banja Luke je podijeljen u dvije eksperimentalne grupe (plivanje N=38 i aerobik N=38), a testiran je sa devet morfoloških varijabli pomoću antropometra po Martinu, vage za mjerenje tjelesne težine, metalne mjerne trake i kalipera. Podaci su obrađeni pomoću tehnike deskriptivne statistike, t-testom i multivarijantnom analizom varijanse i kovarijanse.

Rezultati sa diskusijom

Rekreativni modeli plivanja i aerobika uticali su na pozitivne promjene morfoloških karakteristika kod eksperimentalnih grupa. Statistički značajne promjene ostvarene su u svim mjerenim varijablama kod obje grupe, osim kod varijable Tjelesna masa ($p=0.598$, $t=1.451$) u grupi Aerobik. Grupe se razlikuju kod varijable Kožni nabor suprailiaca ($p=0.039$, $F=4.411$), na inicijalnom mjerenju (Plivanje). Deskriptivno numeričke vrijednosti varijable kožni nabor suprailiaca za I i II mjerenje: plivanje; pre test 33.958 ± 14.138 , post test 23.558 ± 9.128 , $t=6.859$, $p=0.000$, aerobik; pre test 27.216 ± 10.848 , post test 20.192 ± 7.311 , $t=7.190$, $p=0.000$).

Zaključak

Dobijeni rezultati istraživanja ukazuju da različiti modeli sportsko-rekrativnih aktivnosti pozitivno utiču na transformaciju morfoloških karakteristika žena srednje dobi, što ukazuje na mogućnost primjene ovakvih modela na ovu populaciju, ali i preporuku za druge starosne kategorije rekreativaca.

Ključne riječi: rekreativni modeli, žene srednje dobi, morfološke karakteristike

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RAZLIKE U SMJERU I UČINKOVITOSTI ŠUTIRANJA IZMEĐU MUŠKOG I ŽENSKOG VRHUNSKOG RUKOMETA

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Uvod

Imajući u vidu povijesnu evoluciju vrhunskog sporta ali i trendove razvoja kojima možemo danas svjedočiti uočljivo je da spolne razlike određuju specifičnosti sporta ili sportske discipline. Iako rukomet, u okviru vrhunskog sporta, po istim pravilima, igraju i muškarci i žene jasno je da se igra razlikuje u velikom broju strukturnih, kinetičkih i ostalih kinezioloških faktora. Cilj rada je utvrditi i objasniti razlike u smjeru i učinkovitosti šutiranja između muškog i ženskog vrhunskog rukometa.

Metod

Uzorak entiteta predstavljalo je 24 muške i 24 ženske ekipe, sudionice Svjetskog rukometnog prvenstva održanog u Hrvatskoj 2009. godine i u Francuskoj 2007. godine. Manifestne varijable odnose se na dijelove gola u kojima je upućen udarac ili postignut pogodak. Gol je podijeljen na 9 segmenata a varijable su promatrane kroz učestalost, broj golova i učinkovitost. Cjelokupan uzorak predstavljao je ukupno 45 varijabli. Za analizu razlika između grupa koristila se jednosmjerna analiza varijance.

Rezultati sa diskusijom

Kriterij podjele uzorka bio je spol. Analiza razlika pokazala je da se od 18 zbirnih varijabli vrhunske muške i ženske rukometne ekipe statistički značajno razlikuju samo u varijablama SRUDZ i SRZ%. Vidljivo je da rukometašice češće šutiraju u središnji dio gola (za 0.63 puta više) ali im je učinkovitost šutiranja u taj segment značajno slabija u odnosu na rukometaše (za 6.48%). Analiza razlika pokazala je da se od 27 testiranih varijabli koje se odnose na 9 segmenata gola, vrhunske muške i ženske rukometne ekipe statistički značajno razlikuju u samo njih 6. Kada se analiziraju zbirne varijable vidljivo je da rukometaši češće šutiraju u visoke segmente gola. Na razini statističke značajnosti ova pojava je uočena u lijevom visokom segmentu gola, u kojeg rukometaši upućuju značajno više udaraca i postižu značajno više golova. Širina i visina vratnica za rukometaše i rukometašice je jednaka ali njihova fizička konstitucija se ipak razlikuje te rukometašima omogućuje snažniji udarac i veći repertoar šutiranja.

Zaključak

Sveukupno analizirajući moguće je zaključiti kako, vjerojatno zbog prednosti u antropološkim karakteristikama, rukometaši imaju raznovrsniji šut i češće šutiraju visoko. Nasuprot tome, rukometašice, zbog antropoloških karakteristika, koje uvjetuju model taktike i način igre, sklonije su nerezonskim šutiranjima u sredinu gola i niskim šutovima koji se češće izvode sa linijskih pozicija.

Gljučne reči: preciznost, situacijska učinkovitost, udarac na gol, vrhunski rukomet

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THE DIFFERENCES IN THE DIRECTION AND EFFECTIVENESS OF SHOOTING BETWEEN THE TOP MALE AND FEMALE HANDBALL

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Introduction

Bearing in mind the historical evolution of competitive sport and development trends that we witness today is evident that gender differences determine specific sport or sports events. Although handball, within the top-level sport, is played by the same rules for men and women, it is clear that the game is different in a number of structural, kinetic and other factors kinesiology. The aim was to identify and explain the differences in the direction and effectiveness of shooting between male and female top handball.

Method

The sample of subjects represented 24 male and 24 female teams competing in the World Handball Championship held in Croatia in 2009 and in France in 2007. Apparent variables related to the parts where the goal was a shot or a goal is scored. Goal was divided into 9 segments and variables were observed through frequency, number of goals and performance. The entire sample represented a total of 45 variables. For the analysis of differences between groups using the one-way analysis of variance.

Results and discussion

The analysis of aggregate variables shows that handball players more often kick into high segments of the goal area. At the level of statistical significance this phenomenon is observed in the left high segment of the goal where male players shoot more and consequently score significantly more goals. The width and height of the goal posts for male and female is the same but their physical constitution is different. Thus males are enabled allows had a shot and larger range of shooting.

Conclusion

From the complete analysis it is possible to conclude that, probably because of the advantages in anthropological characteristics, male handball players have more versatile shots and shoot high. In contrast, female players, due to the anthropological characteristics that affect the model of tactics and the way of playing, perform more unreasonable shots at goal in the middle and low parts of the goal that are often performed from a line position.

Key words: accuracy, situational efficiency, shot on goal, a top handball player

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RAZLIKE SMJERA ŠUTIRANJA SPRAM POLOŽAJA IZBAČAJNE RUKE U RUKOMETU

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Uvod

Tehnika izbačaja lopte kao i sami položaj lopte u ruci mogući je prediktor utvrđivanja odnosno predviđanja putanje leta i završetka leta lopte. Ovakve su situacije u igri važne za braniče i vratare zbog mogućeg predviđanja leta lopte kako bi se pravovremeno izvela obrambena aktivnost, blok braniča odnosno pravovremeno kretanje i obrana vratara. Osnovni cilj ovog rada jest utvrditi smjer šutiranja lopte ovisno o položaju izbačajne ruke kod vrhunskih rukometaša.

Metod

Uzorak entiteta ovog istraživanja predstavljaju svi udarci na gol izvedeni tijekom 10 utakmica Svjetskog prvenstva za rukometaše održanog u Hrvatskoj 2009. godine. Uzorak varijabli je napravljen na način da su se promatrale frekvencije upućenih lopti na gol šuterskom rukom te su se one zapisivale i svrstavale u odnosu na koji je način lopta upućena. Postavljena su 2 parametra promatranja, a to je parametar položaja ruke u momentu izbačaja lopte i parametar smjera šutiranja na gol. Kod šutiranja na gol podjela je napravljena na situaciju „1“ i „2“. Situacija jedan je obuhvaćala šut bez otklona tijela ili s otklonom u stranu izbačajne ruke, dok je situacija 2 obuhvaćala šut sa otklonom tijela u stranu suprotnoj od izbačajne ruke. Parametar smjera šutiranja na gol promatran je kroz 3 pozicije koje su označene sektorima „1“, „0“ i „2“. Svaki sektor obuhvaćao je prostor od dužine jednog metra. Sektor „1“ je obuhvaćao bliži vratarev kut, sektor „0“ je obuhvaćao sredinu gola, dok je sektor „2“ obuhvaćao dalji vratarev kut. Hi-kvadrat test je korišten za utvrđivanje razlika između frekvencija različitih načina šutiranja na gol u odnosu na dvije analizirane varijable: položaj lopte u trenutku izbačaja i smjer šutiranja.

Rezultati sa diskusijom

Vidi se da je od ukupnog broja udaraca /1431/, najviše udaraca, njih 1194, odnosno 83% izvršeno bez otklona ruke u suprotnu stranu. Na ovakve rezultate prvenstveno utječu biomehaničke pogodnosti ovakvog vida završnice napada, mogućnost postizanja povoljnijeg, odnosno većeg kuta područja šutiranja, ali i neki taktički aspekti angažirane i suprotstavljene ekipe (2). Ovakav položaj omogućava učinkovitu i sukcesivnu aktivaciju zglobova i mišića u kinematičkom lancu, počev od ramena, preko lakta do zgloba šake u završnici te najpovoljniji kut između podlaktice i nadlaktice (1).

Zaključak

Iz dobivenih rezultata postoji statistički značajna povezanost između položaja lopte u šuterskoj ruci i kuta u koji se lopta šutira. Najveći broj udaraca završava bez otklona u dalji kut. Razlog takve selekcije šuta kod napadača je u povoljnijim biomehaničkim aspektima provedbe izbačajnog pokreta. Udarci s otklonom tijela u suprotnu stranu su rjeđi i koriste se kad se igrači nađu u situacijama da im je takav način realizacije jednostavniji.

Ključne reči: situacijska učinkovitost, položaj ruke, smjer šutiranja, rukomet

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VREDNOSTI RAZLIČITIH INDEKSA SPECIFIČNE IZDRŽLJIVOSTI MERENE U ANAEROBNO ALAKTATNOM REŽIMU RADA KOD VRHUNSKIH MLADIH VATERPOLISTA

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Uvod

Struktura vaterpolo igre postavlja zahteve trenerima u trenažnom radu gde se većina specifičnih elemenata realizuje maksimalnim i submaksimalnim intenzitetom, odnosno u vremenskm intervalu do 15 sekundi. Ako se ova informacija posmatra u odnosu na energetske sisteme organizma, većina specifičnih elemenata tehnike se realizuje u anaerobno alaktatnoj energetskej zoni. Dati elementi su zasnovani na efikasanom radu nogama u vodi i to primenom dve osnovne tehnike: udarci nogama prsno ili „bicikl“. Osnovni cilj ovog rada je definisanje vrednosti različitih indeksa specifične izdržljivosti merene u vodi u anaerobno alaktatnom režimu rada kod vrhunskih vaterpolista kadetskog uzrasta.

Metod

Uzorak ispitanika je sastavljen od 29 vaterpolista juniora prosečne visine 185.2 cm, težine 81.7 kg, starosti 15.8 godina i prosečnog trenažnog staža 7.4 godine. Igrači su testirani premenom dve različite metode i to: metodom vučenja u mestu udarcima nogama prsno i metoda održavanja u vertikalnoj poziciji sa dodatnim opterećenjem udarcima nogama „bicikl“ sa rukama u uzručenju. Indeks anaerobno alaktatne izdržljivosti je definisan kao odnos ostvarenih karakteristika sile vuče (F_{MAX} , I_{MP} i RFD), odnosno dodatnog opterećenja (masa tega u kg, MT) intervala od 1 do 5 sekunde i od 11 do 15 sekunde ($\Delta F_{MAX}^{15/5}$, $\Delta I_{MP}^{15/5}$, $\Delta RFD^{15/5}$ i ΔMT). Rezultati su analizirani metodom deskriptivne i komparativne statistike.

Rezultati sa diskusijom

Rezultati su pokazali da su vrednosti indeksa specifične izdržljivosti u anaerobno-alaktatnom režimu naprežanja merene metodom vučenja u mestu (noge prsno) sledeći: za ($\Delta F_{MAX}^{15/5} = 8.20 \pm 9.13$, $cV\% = 111.27$; $\Delta I_{MP}^{15/5} = 8.77 \pm 7.19$, $cV\% = 81.97$; $\Delta RFD^{15/5} = 10.91 \pm 26.59$, $cV\% = 243.63$), odnosno da su vrednosti indeksa specifične izdržljivosti merene metodom održavanja u vrtikalnoj poziciji sa dodatnim opterećenjem (noge „bicikl“) na nivou od $\Delta MT = 63.00 \pm 6.40$, $cV\% = 10.16$. Rezultati ANOVE su pokazali da se vrednosti indeksa specifične izdržljivosti statistički značajno razlikuju na nivou $F=94.91$, $p=0.000$. Rezultati t testa su pokazali postojanje razlike samo između vrednosti indeksa specifične izdržljivosti mereno metodom održavanja u vertikalnoj poziciji (ΔMT) u odnosu na sva tri indeksa specifične izdržljivosti merenih metodom vuče udarcima nogama prsno ($\Delta F_{MAX}^{15/5}$, $\Delta I_{MP}^{15/5}$ i $\Delta RFD^{15/5}$), dok se oni međusobno statistički značajno ne razlikuju.

Zaključak

Razlike vrednosti indeksa između dve metode verovatno je uslovljeno položajem tela u vodi. Indeks dobijen merenjem metodom izdržaja u vertikalnoj poziciji je diskrimnativniji u odnosu na ostala tri. Najverovatniji razlog za to je vertikalna pozicija tela igrača tokom testa i zadatak maksimalnog angažovanja zbog održavanja tela na površini. Takođe, sa aspekta hidrodinamike u vertikalnoj poziciji igrač mora da potiskuje veliku količinu vode nogama na dole zbog održavanja u optimalnom položaju, dok se kod merenja metodom vučenja u mestu telo igrača nalazi u horizontalnoj poziciji, što uslovljava fenomen smicanja slojeva vode (pojava „laminata“).

Ključne reči: indeks specifične izdržljivosti, udarci nogama, aerobno-alaktatni režim

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STUDY ON THE EFFECTIVENESS OF ELEMENT TECHNICAL: ATTACK ON THE LINE II

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Introduction

In the context of the performance perspective in a volleyball game, we consider that improvement and continuous modernization are necessary, not through a simple knowledge selection, but through restructuring of the entire performance system, in relationship with the appearance of the surprise element in the first phase of the game.

Method

Starting from the current analysis on performances in worldwide volleyball and from our internal realities (Women's National Championship, Division A₁), we considered appropriate, to conceptually approach the Romanian volleyball performance optimization strategy, by comparing the results of II-line attack registration, between two Romanian teams and one from the Italian championship and also their report on the final result of the official volleyball game effectiveness.

Results and discussion

By analysing the results of weighting of attack from line II and comparing the technical-tactic level that is played in the two championships (Romanian and Italian), we conclude that the II-line attack efficiency is proportional with the value of the two high above mentioned championships, doubled by the place that the teams, subject of this study, occupy in the ranking. The content of the game and of the technical-tactic actions knows a regress tendency in what involves using the II-line attack, and most of all its efficiency during the time of the entire match, which derives from match records directly between CSU Targu Mures and Dinamo Bucuresti.

Conclusion

The expansion of the sportive performance by permanent connection to the new, must be in accordance and resonance with the own real resources and with the tendencies which manifest in the actual volleyball performance. Our initiative represents „a high ball at the net” for the present and future volleyball coaches who want to improve the game quality on one side, through using the II-line attack safeness element and also to increase the game capacity by framing this technical element in the efficient category.

Key words: volleyball, safeness, efficiency

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KOMPARATIVNA ANALIZA ODREĐENIH MORFOLOŠKIH KARAKTERISTIKA I MOTORIČKIH SPOSOBNOSTI ODBOJKAŠICA KADETSKOG UZRASTA REPREZENTACIJA SRBIJE I CRNE GORE¹

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Uvod

Povezivanje antropometrijskih karakteristika i mera motoričkog prostora u velikoj meri osvetljavaju biološku stranu sportskog uspeha. Performanse sportista se najčešće prate kroz merenje, upoređivanje, praćenje i unapređivanje nekih od ovih karakteristika. Cilj ovog rada je da se prikažu rezultati komparativne analize parametara antropometrijskog i motoričkog prostora ženskih odbojkaških kadetskih reprezentacija Srbije i Crne Gore.

Metod

Ovo je istraživanje transversalnog tipa, a rezultati svih testova su obrađeni postupcima deskriptivne i komparativne statistike (t-test). Za prikupljanje relevantnih podataka, korišćene su standardizovane tehnike i instrumenti za merenje. Uzorak ispitanika su činile dve grupe odbojkašica različitog stepena uspešnosti, kadetskog uzrasta (26 – Srbija i 22 – Crna Gora). Uzorak varijabli je podeljen u dve grupe: morfološke i motoričke.

Rezultati sa diskusijom

Deskriptivni statistički pokazatelji izražavaju razliku u merama morfološkog prostora, u korist reprezentativki Srbije (telesna visina, telesna masa, dohvatna visina smeča, dohvatna visina bloka). Razlika u svim morfološkim karakteristikama je izražena nivoima statističke značajnosti: $p < 0.01$ i $p < 0.05$. Slične razlike u korist reprezentativki Srbije mogu se uočiti i u merama motoričkih sposobnosti. Dok su rezultati nekih motoričkih testova (sprint 5 metara i bacanje medicinke) pokazali razliku na nivou $p < 0.01$, ostali testovi (skok u dalj iz mesta i sprint 20 metara) su pokazali razliku između rezultata reprezentacija na nivou $p < 0.05$. Aktuelno stanje mera morfološkog i motoričkog prostora pokazuje dominantnost reprezentativki Srbije.

Zaključak

Razlike u merama motoričkog prostora se, možda, samo delimično mogu objasniti drugačijim kontekstom periodizacije treninga u ove dve selekcije, dok se razlike u antropometrijskim karakteristikama mogu objasniti samo selekcijom odbojkašica. Reprezentacija Srbije se kvalifikovala na Evropsko prvenstvo u odbojci 2011 godine, dok to nije bio slučaj sa reprezentacijom Crne Gore. Specifičnosti treninga, u skladu sa zakonitostima postizanja sportske forme, mogu biti značajan uzrok razlika u rezultatima motoričkih testova.

Gljučne reči: odbojka, antropometrijske osobine, motoričke sposobnosti, kadetkinje

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COMPARATIVE ANALYSIS OF CERTAIN MORPHOLOGICAL CHARACTERISTICS AND MOTOR SKILLS OF GIRLS VOLLEYBALL CADETS TEAM OF SERBIA AND MONTENEGRO

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Introduction

Connecting anthropometric characteristics and motor space measures greatly illuminate the biological side of sports success. The performance of an athlete is usually followed by measuring, comparing, monitoring and upgrading of some of these characteristics. The aim of this paper is to present the results of a comparative analysis of anthropometric parameters and motor space women's national volleyball cadet team of Serbia and Montenegro.

Method

This is a transversal study, and the results of all tests were analyzed using descriptive and comparative statistics (t-test). For data collection are used appropriate techniques and instruments for measurement. The sample of respondents where consisted of two groups of volleyball players with different degrees of success, cadets (26–Serbia, 22–Montenegro). Variable sample was divided into two groups: morphological and motor.

Results and discussion

Descriptive statistics express the difference in the measurements of morphological space, in favor of Serbian players (height, weight, height within reach spike, block height within reach). Differences in all morphological characteristics of the expressed levels of statistical significance: $p < 0.01$, $p < 0.05$. Similar differences in favor of the Serbian national team can be seen in measures of motor skills. While the results of some motor tests (5-meter sprint and throwing a medicine ball) showed differences at $p < 0.01$, other tests (standing long jump and sprint of 20 meters) showed the difference between the results of teams of $p < 0.05$. Current state of measures for morphological and motor space shows dominance of Serbian national team.

Conclusion

The differences in the measurements of the motor space, perhaps only partly could be explained by different context periodization of training in these two selections, while differences in anthropometric characteristics explain only a selection of volleyball players. The Serbian team manages to qualify for the European Volleyball Championship in 2011, while this was not the case with the national team of Montenegro. Specificity of training, in accordance with the principles of achieving sporting form, can be a significant cause of the difference in the results of motor tests.

Key words: beach, anthropometric characteristics, motor abilities, cadets

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FUNKCIONALNI DIMORFIZAM F-T KARAKTERISTIKA OPRUŽAČA NOGU KOD VRHUNSKIH SPORTISTA I NETRENIRANIH OSOBA¹

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Uvod

Funkcionalni dimorfizam predstavlja odnos određene fizičke ili motoričke sposobnosti između dva parna ekstremiteta. Cilj rada je definisanje funkcionalnog dimorfizma i modela različitih indikatora za procenu izometrijskih F-t karakteristika opružača nogu merenih na 100 i 50% od maksimalne sile i na 100, 180 i 250ms od početka mišićne kontrakcije kod vrhunskih sportista i netreniranih osoba muškog pola.

Metod

U istraživanju je učestvovalo 203 vrhunskih sportista i 33 netreniranih osoba muškog pola, a korišćen je standardizovan izometrijski „leg press” test za procenu karakteristika izometrijske sile opružača nogu u bilateralnom i unilateralnom režimu napreznja. Merni opseg definisan je na osnovu 10 varijabli koje se odnose na kontraktilne karakteristike izometrijske sile ekstenzora nogu merene na nivou 100%, 50%, 100 ms, 180 ms and 250 ms od maksimalne sile ($F_{\max\text{LEGEXTISO}}$), indikator bazičnog (opšteg) nivoa intenziteta prirasta sile – $\text{RFD}_{\text{BASICLEGEXTISO}}$, indikator specifičnog nivoa intenziteta prirasta sile – $\text{RFD}_{50\%\text{LEGEXTISO}}$, i tri indikatora specijalnog nivoa intenziteta prirasta sile, merenih na 250ms – $\text{RFD}_{250\text{msLEGEXTISO}}$, na 180ms – $\text{RFD}_{180\text{msLEGEXTISO}}$ i 100ms – $\text{RFD}_{100\text{msLEGEXTISO}}$.

Rezultati sa diskusijom

U funkciji praćenih F-t karakteristika kod vrhunskih sportista utvrđen je funkcionalni dimorfizam na statistički značajnom nivou između dominantne i nedominantne noge kod $F_{\max\text{LEGEXTISO}}$ $t=7.715$, $p=0.000$, $F_{50\%\text{LEGEXTISO}}$ $t=7.744$, $p=0.000$, $F_{180\text{msLEGEXTISO}}$ $t=2.162$, $p=0.032$, $F_{250\text{msLEGEXTISO}}$ $t=3.288$, $p=0.001$, $\text{RFD}_{\text{BASICLEGEXTISO}}$ $t=2.098$, $p=0.037$, $\text{RFD}_{50\%\text{LEGEXTISO}}$ $t=3.071$, $p=0.002$, $\text{RFD}_{180\text{msLEGEXTISO}}$ $t=2.198$, $p=0.029$, $\text{RFD}_{250\text{msLEGEXTISO}}$ $t=3.241$, $p=0.001$, dok kod netreniranih osoba na nivou $F_{100\text{msLEGEXTISO}}$ $t=2.429$, $p=0.022$ i $\text{RFD}_{100\text{msLEGEXTISO}}$ $t=2.517$, $p=0.018$.

Zaključci

Na osnovu prikazanih rezultata, sa aspekta funkcionalnog odnosa između nedominantne i dominantne noge, može se zaključiti da su vrhunski sportisti i netrenirane osobe adaptirani da na različite načine ispoljavaju mišićnu silu i njene karakteristike. S obzirom na činjenicu da mišići nogu predstavljaju značajnu, gotovo presudnu aktivnu jedinicu od koje, zajedno sa karakteristikama koštano-zglobnog sistema zavisi uspeh u lokomotivnoj aktivnosti, pa i u drugim vrstama kretanja potrebno je u nekom narednom istraživanju detaljno istražiti i ispitati uticaj dugotrajnih trenažnih napora kod sportskih grana gde se dominantno koristi jedna noga na prirodni nivo funkcionalnog i polnog dimorfizma različitih uzrasnih kategorija.

Ključne reči: F-t karakteristike, opružači nogu, funkcionalni dimorfizam

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FUNCTIONAL DIMORPHISM OF LEG EXTENSORS FORCE-TIME CHARACTERISTICS REGARDING TOP LEVEL ATHLETES AND UNTRAINED MALES

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Introduction

Functional dimorphism represents the relation of certain physical or motor ability between two extremities. The aim of this paper was to define functional dimorphism and model of different indicators for evaluating leg extensors force-time characteristics, being measured at 100 and 50% of the maximal force and at 100, 180 and 250ms from the beginning of the muscle contraction in top level athletes and untrained males.

Method

203 well trained and healthy Serbian male national level athletes and 33 untrained males performed a standardized “isometric leg press” test in order to assess the characteristics of isometric force from their leg extensors (unilateral and bilateral). The measurement range was defined by 10 variables regarding the contractile characteristics of the leg extensors isometric muscle force at the level of 100%, 50%, 100 ms, 180 ms and 250 ms of maximal force ($F_{\max\text{LEGEXTISO}}$), the indicator of basic (general) level of rate of force development – $\text{RFD}_{\text{BASICLEGEXTISO}}$, the indicator of specific level of rate of force development – $\text{RFD}_{50\%\text{LEGEXTISO}}$, and three indicators for evaluating special level of the explosive force development, measured at 250ms – $\text{RFD}_{250\text{msLEGEXTISO}}$, at 180ms – $\text{RFD}_{180\text{msLEGEXTISO}}$ and 100ms – $\text{RFD}_{100\text{msLEGEXTISO}}$.

Results with discussions

In the function of the observed force-time characteristics in top level athletes statistically significant functional dimorphism between dominant and non-dominant leg was determined in $F_{\max\text{LEGEXTISO}}$ $t=7.715$, $p=0.000$, $F_{50\%\text{LEGEXTISO}}$ $t=7.744$, $p=0.000$, $F_{180\text{msLEGEXTISO}}$ $t=2.162$, $p=0.032$, $F_{250\text{msLEGEXTISO}}$ $t=3.288$, $p=0.001$, $\text{RFD}_{\text{BASICLEGEXTISO}}$ $t=2.098$, $p=0.037$, $\text{RFD}_{50\%\text{LEGEXTISO}}$ $t=3.071$, $p=0.002$, $\text{RFD}_{180\text{msLEGEXTISO}}$ $t=2.198$, $p=0.029$, $\text{RFD}_{250\text{msLEGEXTISO}}$ $t=3.241$, $p=0.001$, and in untrained males only in $F_{100\text{msLEGEXTISO}}$ $t=2.429$, $p=0.022$ and $\text{RFD}_{180\text{msLEGEXTISO}}$ $t=2.517$, $p=0.018$.

Conclusions

Based on the obtained results, in the aspect of the functional relationship between non-dominant and dominant leg, it can be concluded that athletes and untrained male are adapted to demonstrate muscle force and its characteristics differently. Since leg muscles represent significant, almost crucial active units, which are, together with bone-joint system, important for successful locomotion, and for other types of movement as well, some future studies should explore and examine the influence of longterm training efforts on natural level of functional and sexual dimorphism in different age categories in disciplines where one leg is used more dominantly.

Key words: force-time characteristics, leg extensors, functional dimorphism

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KARAKTERISTIKE SILE MIŠIĆA NOGU VRHUNSKIH KARATISTA U ODNOSU NA OPŠTE TRENIRANU POPULACIJU

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Uvod

Kretne strukture u karateu izuzetno su specifične i zahtevne za sve mišićne grupe, naročito za mišiće ekstenzore nogu. Cilj rada je definisanje karakteristika eksplozivne izometrijske sile mišića ekstenzora nogu kod vrhunskih karatista u odnosu na opšte treniranu populaciju.

Metod

Testirano je 24 ispitanika raspoređenih u 2 grupe: vrhunski karatisti (N=10) i opšte trenirana populacija (N=14). Za procenu eksplozivne izometrijske sile ekstenzora nogu korišćena je standardizovana oprema i standardizovan test u sedećem položaju - "leg press". Sve karakteristike pri izvođenju testa su praćene bilateralno i unilateralno (dominantna i nedominantna noga). Rezultati su normalizovani u odnosu na telesnu masu. Za procenu razlika između grupa korišćen je t-test za nezavisne uzorke.

Rezultati sa diskusijom

Statistički značajne razlike u t-testu ($p < 0.05$) dobijene su za sledeće varijable: F_{\max} (bilateralno - $t=3.92$, $p=0.009$ i unilateralno - $t_{\text{dom}}=2.79$, $p=0.011$; $t_{\text{nedom}}=3.32$, $p=0.003$), $RFD_{100\text{ms}}$ ($t=2.28$, $p=0.033$), $RFD_{180\text{ms}}$ ($t=2.60$; $p=0.017$) i $RFD_{250\text{ms}}$ ($t=2.67$, $p=0.014$) samo bilateralno. Kod RFD_{Fmax} nisu pronađene statistički značajne razlike. Dobijeni rezultati mogu se pripisati specifičnim sposobnostima karatista koje se ogledaju u konstantnoj borbi za osvajanje distance, održavanje distance, poentiranje kao i eksplozivnim karakteristikama pokreta u karate sportu.

Zaključak

Može se zaključiti da struktura kretanja u karateu dovodi do specifične adaptacije mišića nogu, koje se ogledaju u relativno boljim karakteristikama eksplozivne izometrijske sile u odnosu na opšte treniranu populaciju.

Glavne reči: karatisti, eksplozivna sila, specifične sposobnosti

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CHARACTERISTICS OF FORCE LEG MUSCLES OF ELITE KARATEKA COMPARED TO GENERAL TRAINED POPULATION

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Introduction

Karate movement structures are very specific and demanding for all muscle groups, especially the leg extensor muscles. The aim of the defining characteristics of explosive isometric leg extensor muscles in elite karate-trained compared to the general population.

Method

34 patients divided into 2 groups were tested: elite karateka (N=10) and trained general population (N=14). To assess explosive leg extensor isometric force was used by standardized equipment and a standardized test in a sitting position - "leg press". All the characteristics of the performance of the test were observed bilaterally and unilaterally (dominant and non-dominant leg). To assess the difference between groups the t-test for independent samples was used. The results are normalized with respect to body mass.

Results and discussion

Statistically significant differences in the t-test ($p < 0.05$) were obtained for the following variables: F_{\max} (bilateral- $t=3.92$, $p=0.009$ and unilateral- $t_{\text{bil}}=2.79$, $p=0.011$; $t_{\text{unil}}=3.32$, $p=0.003$), $\text{RFD}_{100\text{ms}}$ ($t=2.28$, $p=0.033$), $\text{RFD}_{180\text{ms}}$ ($t=2.60$; $p=0.017$) and $\text{RFD}_{250\text{ms}}$ ($t=2.67$, $p=0.014$) only bilaterally. In $\text{RFD}_{F_{\max}}$ no statistically significant differences were identified. The results can be attributed to specific abilities karatists reflected in the constant battle to conquer distance, maintaining distance, scoring and explosive characteristics of movements in karate.

Conclusion

It can be concluded that the structure of movement in karate results in specific adaptations of the leg muscles, which are reflected in the relatively better features isometric explosive force in relation to the general trained population.

Key words: karateka, explosive force, specific skills

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RAZLIKE MOTORIČKIH SPOSOBNOSTI MERENIH U VODI SELEKTIRANIH VATERPOLISTA RAZLIČITIH GENERACIJA ISTOG UZRATA

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Uvod

Promena pravila igre sa osnovnom idejom da dođe do ubrzanja igre i atraktivnosti takmičenja, se donose svake četvrte godine nakon olimpijskog ciklusa. Da bi ostvarili vrhunski nivo igre jedan od uslova vaterpolo ekipa je adekvatna plivačka pripremljenost. Pripremljenost vaterpoliste (seniora) se postiže višegodišnjim trenažnim procesom. Zato je izuzetno bitno da se kvalitetno radi sa mlađim kategorijama. Kontrola trenažnog rada je bitan element svakog trenažnog procesa. Osnovni cilj ovog rada je poređenje motoričkih sposobnosti u vodi vaterpolista različitih generacija istog uzrasta (kadeta).

Metod

Uzorak ispitanika se sastoji od dve grupe selektiranih vaterpolista istog uzrasta od po 19 igrača. Igrači kadeti iz sezone 2000/01 bili su prosečne starosti 14.5 godina, težine 67.61 kg, visine 177.26 cm i prosečnog trenažnog staža 5.9 godina, a igrači kadeti iz sezone 2009/10 bili su prosečne starosti 14.3 godina, težine 74.57 kg, visine 181.32 cm i prosečnog trenažnog staža 6.6 godina. Za proveru specifičnih motoričkih sposobnosti u vodi korišćeni su standardizovani testovi u vodi. Mereno je 25m, 50m i 200m kraul tehnikom metodom hronometrije. Rezultati su analizirani primenom deskriptivne i komparativne statistike.

Rezultati sa diskusijom

Rezultati su pokazali da nema statistički značajne razlike između grupa u razvoju anaerobno-glikolitičkih karakteristika, plivanje kraul tehnikom 25m (AVG_1 13.52±0.71 s; AVG_2 13.49±0.60 s; $p=0.84$) i anaerobno-laktatnih karakteristika, plivanje kraul tehnikom 50m (AVG_1 29.40±1.43 s; AVG_2 29.17±1.02 s; $p=0.501$) a da postoje statistički značajna razlika između grupa u razvoju aerobnih karakteristika, plivanje kraul tehnikom 200m (AVG_1 149.54±6.59 s; AVG_2 144.42±5.38 s; $p=0.008$). Takođe između grupa postoji statistički značajna razlika u morfološkim karakteristikama igrača (TT_1 67.61±7.11 kg; TT_2 74.57±6.23 kg; $p=0.013$, a TV_1 177.26±4.04 cm; TV_2 181.32±5.61 cm; $p=0.006$), igrači generacije 2009/10 su i teži i viši a imaju i duži trenažni staž (TS_1 5.9±0.81 god; TS_2 6.63±1.16 god; $p=0.018$), skoro godinu dana su duže u trenažnom procesu, dok su približno istog uzrasta (GS_1 14.5±0.61 god; GS_2 14.3±0.73 god; $p=0.259$).

Zaključak

Na osnovu dobijenih rezultata može se zaključiti da generacija 2009/10 ima bolje razvijen aerobni kapacitet, verovatno kao posledicu dužeg trenažnog staža i boljih morfoloških karakteristika. Razvoj anaerobno-laktatnih karakteristika nije primarni cilj u ovom periodu razvoja igrača pa je logično da nema razlike, ali trebalo bi da su anaerobno-glikolitičke karakteristike igrača bolje razvijene s obzirom da su pravila igre pretrpela značajne promene sa ciljem ubrzanja i veće dinamike igre. Može se zaključiti da trening nije bio usmeren u pravcu ubrzanja igre, pa možemo da kažemo da je to jedan od trenažnih zadataka za budući rad.

Ključne reči: vaterpolo pravila, ubrzanje igre, trenažni proces, testovi u vodi

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KINEMATIČKE KARAKTERISTIKE UDARCA RUKOM VRHUNSKIH KARATISTA RAZLIČITE SPECIJALIZACIJE

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Uvod

Karate je iz forme veštine u vrlo kratkom periodu počeo da se razvija u sportsku disciplinu. Danas je sport dominantna odrednica kada se govori o fenomenu karatea, sa svim karakteristikama koje podrazumeva savremena trenazno-takmičarska tehnologija. Takmičenja u karateu održavaju se u dve discipline – kate i borbe. Takmičarska pravila uslovlila su značajnije razlike u samom trenaznom procesu u ovim disciplinama. Cilj ovog rada je utvrđivanje razlika u izvođenju dominantne tehnike rukom u karateu gjaku zuki kod takmičara u katama i takmičara u borbama.

Metod

U ovom radu ispitanike su činili vrhunski takmičari seniorskog urasta, u katama (13) i borbama (16), muškog pola. Ispitivan je dominantan udarac rukom u karateu - gjaku zuki. Podaci su prikupljeni korišćenjem 3D infracrvenih kamera, sa frekvencijom uzorkovanja signala od 240Hz, a skladištenje podataka izvršeno je pomoću Qualisys track manager sistema. U sledećem koraku korišćen je softver napravljen u programu LabView za kinematičke varijable udarca. Za definisanje razlika jednodimenzionalnog prostora korišćena je metoda analize varijanse (ANOVA), dok je razlika između parova pojedinačnih varijabli utvrđivana primenom Bonferoni kriterijuma. Kriterijum nivoa statistički značajne razlike je bio na 95%, odnosno $p < 0.05$.

Rezultati sa diskusijom

Rezultate ANOVE su pokazali da postoji statistički značajna razlika za varijable vreme trajanja udarca ($p=0.008$), vreme početka pokreta šake ($p=0.033$), vreme početka pokreta kolena zadnje noge ($p=0.017$) i maksimalno ubrzanja kuka ($p=0.039$). Blizu granice statističke značajnosti su i rezultati za varijable vreme početka pokreta lakta ($p=0.063$), maksimalna brzina šake ($p=0.063$) i prosečna brzina kuka ($p=0.051$). Takmičari u katama izvode udarac za kraće vreme, pre započinju udarac i postižu veće brzine praćenih tačaka, osim maksimalne brzine šake koja je veća kod boraca.

Zaključak

Rezultati ovog istraživanja ukazuju na postojanje razlika u kinematičkim karakteristikama udarca gjaku zuki kod vrhunskih karatista različite specijalizacije. Na osnovu dobijenih razlika može se zaključiti da takmičari u katama i borbama izvođenje ispitivanog udarca zasnivaju na različitim kinematičkim shemama.

Cljučne reči: karate, takmičarska specijalizacija, vrhunski sportisti

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KINEMATIC PUNCH CHARACTERISTICS OF THE TOP KARATE COMPETITORS OF DIFFERENT SPECIALIZATION

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Introduction

Karate has evolved from the form of art to sport's discipline in a very short period. Today sport is a dominant term when we talk about the karate phenomenon, with all the characteristics implied by training-competition technologies. The karate competitions are held in two disciplines - katas and fights. The competition rules have made significant differences in the training process in these disciplines. The aim of this paper was to determine the differences in performing a dominant punch in karate gjaku zuki among the competitors in katas and the competitors in fights.

Method

In this paper the examinees are the top male senior competitors in katas (13) and fights (16). A dominant karate punch gjaku zuki has been examined. The data were collected by means of 3D infrared cameras, with sampling frequency 240Hz, and stored via Qualisys track manager system. In the next step the software made in LabView programme was used for kinematic variables of the punch. A method for the analysis of variance (ANOVA) was used for defining differences of one-dimensional space, while the difference among pairs of single variables was established by usage of Bonferoni criteria. The criterion for the level of statistically significant difference was at 95%, i.e. $p < 0.05$.

Results with discussion

The results of ANOVA have indicated that there is a statistically significant difference for the variables of the time duration of a punch ($p=0.008$), the start time of the hand movement ($p=0.033$), the start time of the back leg knee movement ($p=0.017$) and a maximal hip acceleration ($p=0.039$). Near the border of statistical significance are the results for the variables of the start time of the elbow movement ($p=0.063$), the maximal hand speed ($p=0.063$) and the average hip speed ($p=0.051$). The kata competitors perform the punch for shorter time, start the punch earlier and achieve higher speed of monitored items, except the maximal hand speed, which is higher among fighters.

Conclusion

The results of this research indicate that there are differences in kinematic characteristics of the punch gjaku zuki among the top karate competitors of different specialization. On the basis of these differences we can conclude that the kata and fight competitors' performance of the examined punch is based on different kinematic schemes.

Key words: karate, competitors' specialization, top athletes

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RELIABILNOST KARAKTERISTIKA SILE REAKCIJE PODLOGE STANDARDIZOVANIH SKOKOVA UVIS KOD TRENIRANIH I NETRENIRANIH OSOBA ŽENSKOG POLA

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Uvod

Najzastupljeniji tehničko-taktički element igre u odbojci je skok uvis. Prilikom kontrole utreniranosti odbojkašica, pored ostalih komponenti pripremljenosti (energetika, taktika, psihologija...), velika pažnja se posvećuje pripremljenosti, sa aspekta sposobnosti realizacije različitih tehnika skokova uvis. Cilj ovog rada je da se utvrdi reliabilnost karakteristika sile reakcije podloge kod dva standardizovana skok u odnosu na trenirane i netrenirane osobe ženskog pola. Dobijeni podaci će ukazati na metodološki pristup testiranja kod osoba sa različitim nivoom sportsko-treznog iskustva.

Metod

U istraživanju je učestvovalo 38 ispitanica podeljene u dve grupe: vrhunske odbojkašice (Uzrast: 20.0±3.7 god., TV=180.0±8.6 cm, TM=60.8±8.0 kg) i kontrolna grupa (Uzrast: 21.1±1.1 god., TV=167.8±3.7 cm, TM=60.3±5.0 kg). Ispitivane su sledeće karakteristike sile reakcije podloge, koje su ostvarene tokom realizacije dva skoka: skoka uvis sa zamahom (CMJ_{ARM}) i bez zamaha (CMJ_{NOARM}) rukama i to: F_{MAX_CON} – maksimalna sila u koncentričnoj fazi; V_{MAX_CON} – maksimalna brzina u koncentričnoj fazi; RFD_{CON} – intenzitet razvoja sile u koncentričnoj fazi; P_{MAX} – maksimalna snaga ostvarena pri skoku uvis; P_{AVG} – prosečna snaga ostvarena pri skoku uvis. Rezultati će se analizirati primenom deskriptivne i korelacione statističke metode.

Rezultati sa diskusijom

Rezultati su pokazali da postoji razlika između pouzdanosti skoka uvis sa zamahom i bez zamaha rukama kod treniranih i netreniranih osoba ženskog pola. Od pet karakteristika sile reakcije podloge za skok CMJ_{NOARM} kod odbojkašica samo su dve bile pouzdane (F_{MAX_CON}, p=0.014 i RFD_{CON}, p=0.003), dok kod kontrolne grupe nijedna varijabla se nije pouzdano ispoljavala. Za skok CMJ_{ARM} kod odbojkašica tri varijable su bile pouzdane (V_{MAX_CON}, p=0.02, P_{MAX}=0.04, P_{AVG}=0.02), a kod kontrolne grupe dve (F_{MAX_CON}, p=0.01 i P_{MAX}, p=0.004).

Zaključak

Na osnovu rezultata može se zaključiti da različite vrste skokova različito treniranih osoba ženskog pola realizuju ispoljavanje karakteristika sile reakcije podloge sa različitim pouzdanosti (načinom). To upućuje na razmišljanje postojanja moguće potrebe korigovanja pristupa metodologiji testiranja neutreniranih osoba u smeru povećanja skokova odnosno broja pokušaja prilikom njihovog testiranja.

Ključne reči: pouzdanost, skokovi, sila reakcije podloge

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RELIABILITY OF CHARACTERISTICS OF FORCE REACTION IN STANDARDIZED VERTICAL JUMPS WITH TRAINED AND UNTRAINED FEMALE PERSONS

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Introduction

The most frequent technical-tactical element in the game in volleyball is vertical jump. When controlling the training level of female volleyball players, along with other components of how well they are prepared (energy, tactics, psychology, etc.), substantial attention is given to preparation from the aspect of the capability to realize various techniques of vertical jumps. The goal of this study is to determine reliability of characteristics of force reaction in two standardized jumps with regard to trained and untrained persons with different levels of sports-training experience.

Method

The study comprised 38 subjects divided into 2 groups: top female volleyball players (Ages: 20.0±3.7 years, BH=180.0±8.6 cm, BM=60.8±8.0 kg) and control group (Ages: 21.1±1.1 years, BH=167.8±3.7 cm, BW=60.3±5.0 kg). Following characteristics were examined in force reaction achieved during realization of two jumps: countermovement jump with arm swing (CMJ_{ARM}) and countermovement jump no arm swing (CMJ_{NOARM}), as follows: F_{MAX_CON} – maximum force in the concentric phase; V_{MAX_CON} – maximum velocity in the concentric phase; RFD_{CON} – the rate of force development in the concentric phase; P_{MAX} – maximum power in vertical jump; P_{AVG} – average power in vertical jump. The results will be analyzed by means of descriptive and correlation statistical methods.

Results and discussion

The results proved that there is a difference between reliability of CMJ_{ARM} and CMJ_{NOARM} of trained and untrained female persons. Out of five characteristics of force reaction for the jump CMJ_{NOARM} at volleyball players only two were reliable (F_{MAX_CON} , $p=0.014$ and RFD_{CON} , $p=0.003$), while at control group none of the variables were reliably exposed. For the jump CMJ_{ARM} at volleyball players three variables were reliable (V_{MAX_CON} , $p=0.02$, $P_{MAX}=0.04$, $P_{AVG}=0.02$, while in the control group there were two (F_{MAX_CON} , $p=0.01$ and P_{MAX} , $p=0.004$).

Conclusion

The conclusion can be reached based on the results that various types of jumps of differently trained female persons realize exposing characteristics of force reaction of different reliability (modality). That leads to consideration of possible necessity to correct the approach to methodology of testing trained and untrained persons towards increase of jumps, i.e., number of attempts during testing.

Key words: reliability, jumps, force reaction

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THE LEVELS OF TRANSFORMATION PROCESSES OF MORPHOLOGICAL CHARACTERISTICS OF WOMEN UNDER THE INFLUENCE OF DIFFERENT SPORT AND RECREATIONAL ACTIVITIES

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Introduction

Modern/sitting man is exposed to different risk factors that represent a threat to his health. In order to keep and improve his health and working capacities, he needs to eliminate a big number of risk factors and resort to regular forms of physical activities. The different models of sport and recreational activities can positively impact the entire anthropological status of women. The research was undertaken in order to determine the transformation levels of morphological characteristics of women of 35 to 45 years of chronological age, under the influence of a three-month recreational program of swimming and aerobics.

Method

A sample of recreationally active women from Banja Luka was divided into two experimental groups (swimming N=38 and aerobics N=38) and tested for nine morphological variables by anthropometer according to Martin, the scale for measuring body weight, measuring tape and calliper. The data were processed by descriptive statistics technique, t-test and multi-variant variance and covariance analysis.

Results and discussion

Recreational models of swimming and aerobics resulted in positive changes of morphological characteristics with experimental groups. Statistically significant changes (t-test) were achieved in all measured variables ($p=0.000$) with both groups, except for variable Body mass ($p=0.598$, $t=1.451$) in Aerobic group. The variable Skinfold suprailiac ($p=0.039$, $F=4.411$), differed between the groups, during the initial measurement (Swimming). Descriptive numerical values of the variable Skinfold suprailiac for 1st and 2nd measurements: swimming: pre-test 33.958 ± 14.138 , post-test 23.558 ± 9.128 , and $t=6.859$, $p=0.000$, aerobic; pre-test 27.216 ± 10.848 , post-test 20.192 ± 7.311 , $t=7.190$, $p=0,000$).

Conclusion

The results obtained in the research indicate that different models of sport-recreational activities have a positive impact on transformation of morphological characteristics of middle-age women, which points out at a possibility of the application of such models to this population, and also represents a recommendation for other age categories of recreationally active persons.

Key words: recreational models, middle-age women, morphological characteristics

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SEKCIJA 3

**METODIČKI ASPEKTI EFEKATA PRIMENE FIZIČKIH AKTIVNOSTI
U FIZIČKOM VASPITANJU, SPORTU I REKREACIJI**

SESSION 3

**ASPECTS OF TEACHING METHODS OF THE EFFECTS
OF PHYSICAL ACTIVITY APPLICATION IN PE, SPORT AND RECREATION**

STUDY ON THE FACTORS DETERMINING THE DENSITY FLUCTUATIONS OF THE VARIABLES INVOLVED IN PHYSICAL EDUCATION AND SPORTS LESSONS - SECONDARY SCHOOL EDUCATION

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Introduction

One of the most important problems of process is the lesson, density which is an important indicator of the quality of teaching. The aim of the research was that the introduction of the educational process of methodological and organizational means and measures to improve density may result in physical and sports lesson.

Method

The research was conducted at the National College Brasov, Romania, in the period: January 12 to February 12, 2012 and is registered as motor and pedagogical protocols of density of 6 lessons in each class included in the study. Research students were enrolled in grades and VIII (3 classes on each level, comprising a total of 70 students in the class V, and 70 in eighth grade). Methods used in research: the study of bibliography specialized method, observation method, questionnaire method, statistical method - mathematical and graphical method.

Results and discussion

In the two classes following relevant results were recorded: the average density motive in class V - 50, 25%, average density teaching the same class 30,0,5%, average density motive eighth grade 51,5%, the average density in the same class teacher 28,0,5%. The main negative reasons that led these lessons density fluctuations relative to the current requirements were: organizational facilities, equipment failure optimum conditions etc. methodical nature: too long and unclear explanations, demonstrations unconvincing incorrectly selected drives etc.

Conclusion

Investigation undertaken and recorded data density based protocols revealed a lack of concern of teachers to improve lesson density and lack of main directions of efficiency, which we will develop and implement programs to improve their strategy, both at specialist teachers and the early career teachers.

Key words: physical education, pedagogical density, variables

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AKTUELNI PROBLEMI BAVLJENJA SPORTOM UČENIKA OSNOVNE ŠKOLE

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Uvod

Poslednjih godina konstantno se govori kako se kod nas sve veći broj dece bavi sportom i kako taj trend iz godine u godinu raste. Osim novinskih članaka i izjava u sredstvima informisanja, do sada niko nije sproveo neko opširnije istraživanje o tome.

Metod

Ispitivanje sprovedeno 2012. godine na opštini Palilula, uzorak su činila 854 učenika petog, šestog, sedmog i osmog razreda 12 osnovnih škola sa teritorije Beograda. Anketa je sadržala 8 pitanja koja se odnose na bavljenje fizičkim vežbanjem i slobodno vreme.

Rezultati sa diskusijom

Oko 80% naše dece od 5-8 razreda, fizičku aktivnost upražnjava jedino na časovima fizičkog vaspitanja i izabranog sporta. Preko 80% nema materijalne mogućnosti za bavljenje sportom. 16% dece se bavi sportom; 82% učenika bavi se fizičkom aktivnošću jedino na časovima fizičkog vaspitanja i izabranog sporta; 2% ne sme da se bavi fizičkim vežbanjem iz zdravstvenih razloga. Razlozi za nebavljenje sportom su sledeći: 79% nema materijalnih sredstava; 11% ne voli da se bavi sportom; ostalih 10% razlog nalazi u udaljenosi sportskog kluba od mesta stanovanja. Svega 44% učenika u slobodno vreme upražnjava fizičku aktivnost (igra u parku – dvorištu fudbal, košarku, odbojku, lastiš...). 56% učenika slobodno vreme provodi uz kompjuter ili televizor i nema nikakvu fizičku aktivnost, osim šetnje sa drugovima i drugaricama. Sportska sekcija postoji u 8 od 12 anketiranih škola. U 10 od 12 škola koje su učestvovala u anketi po stoje sportski klubovi kojima se izdaje sala. Skoro 95% učenika podržava organizovanje "Školica sporta" u školi koju bi vodilo stručno veće fizičkog vaspitanja.

Zaključak

Materijalna situacija velike većine naših porodica onemogućava roditeljima da izdvoje sredstva za bavljenje sportom njihove dece. Polako sport postaje privilegija bogatih slojeva u društvu. Država sistemski treba da napravi strategiju školskog sporta, zdravstvenog vaspitanja, prevencije od bolesti jer je preventiva ekonomski isplativija od lečenja. Jedno od mogućih rešenja je i projekat „Školica sporta“.

Cljučne reči: sport, učenici, osnovna škola

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CONTEMPORARY PROBLEMS OF THE ELEMENTARY SCHOOL STUDENTS PRACTICING SPORTS

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Introduction

There has been constant discussion about the increasing number of children doing sports in recent years and that being a rising trend year after year. Apart from newspaper articles and statements in the media no one has undertaken a more comprehensive research on the topic.

Method

Survey was conducted in Palilula municipality in 2012, sample consisted of 854 fifth, sixth, seventh and eighth grade students from 12 primary schools on the territory of Belgrade. The questionnaire contained 8 questions referring to physical exercise and free time.

Results and discussion

Around 80% of Serbian children from fifth to eighth grade practice physical activity only on physical education and chosen sport classes. Over 80% do not have the necessary financial means for practicing sports. 16% of children practice sports; 82% of students practice physical activity only on physical education and chosen sport classes; 2% are not allowed to exercise due to health issues. Reasons for not practicing sports are the following: 79% do not have the necessary financial means; 11% do not like sports; and the remaining 10% find the reason in the remoteness of the sport club from their living place. Only 44% of students practice physical activity in their spare time (playing football, basketball, volleyball, jumping the rope etc. in the park or the yard). 56% of students spend their free time in front of a computer or television and do not have any physical activity whatsoever apart from taking walks with their friends. Sports section exists in 8 out of 12 surveyed schools. In 10 out of 12 schools that participated in the survey there are sports clubs that are renting the school gym. Almost 95% of students support organizing "Little school of sports" that would be led by an expert physical education board.

Conclusion

Economic situation of a great majority of Serbian families prevents parents from gathering the funds for engaging their children in sport. Sport is slowly becoming the privilege of the society's affluent. The state needs to come up with a systematic strategy for school sport, health education and disease prevention because prevention is economically more beneficent than treatment. One of the possible solutions is the project "Little school of sports".

Key words: sport, pupils, elementary school

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EFEKTI PRIMJENE KOREKTIVNOG VJEŽBANJA NA KOREKCIJU POSTURALNIH POREMEĆAJA SREDNJOŠKOLSKE OMLADINE

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Uvod

Jedan od zadataka vaspitno-obrazovnog rada je pozitivan uticaj na razvoj i zdravlje djeteta, ali prevencija posturalnih poremećaja je zanemaren. Duži period se ističe da su posturalni poremećaji kod djece u stalnom porastu. Kovač (2) ističe kifoza, lordoza i skolioza kao najčešće deformitete kičme u djetinjstvu, te navodi probleme rane dijagnostike. Jovović (1) je zaključio da je kod velikog broja učenika-ca status lokomotornog aparata ugrožen.

Metod

Problem istraživanja je efekat primijenjenih sadržaja korektivnog vježbanja na korekciju posturalnih poremećaja tokom jednogodišnjeg školovanja učenika starosti 15 godina (± 6 mjeseci). Postavljena je hipoteza: očekuje se da će između kontrolne i eksperimentalne grupe biti razlike u finalnom mjerenju. Ispitanici su podijeljeni u dvije grupe - eksperimentalnu i kontrolnu. Istraživanje je provedeno na početku i na kraju školske godine. Primijenjena je somatoskopska metoda - posmatrana je postura određenim redoslijedom po segmentima. Ukoliko je uočeno odstupanje u frontalnoj ili sagitalnoj ravni, viskom i lenjirom se detektovao stepen posturalnog poremećaja, te je prema poremećaju, učenicima eksperimentalne grupe, osmišljen program za svakog učenika, kojim je na časovima fizičkog vaspitanja, korektivnim vježbanjem i sadržajima nastave, pokušano korigovati poremećaje. Ispitanici kontrolne grupe su vježbali po planu i programu FV. Procjena efekata programa vršila se na osnovu varijabli: kifotično, lordotično i skliotično držanje. Podatci su obrađeni paketom SPSS 17.0. Do valjanih zaključaka došlo se deskriptivnim parametrima varijabli i analizom kovarijanse.

Rezultati sa diskusijom

Na osnovu vrijednosti značajnosti uočeno je da ne postoji statistička značajnost nijedne varijable, na nivoima 0.01 i 0.05, tj. ne postoje razlike u vrijednostima između eksperimentalne i kontrolne grupe i može se konstatovati da primijenjeni program korektivnog vježbanja nije imao uticaja na korekciju posturalnih poremećaja, te se hipoteza odbacuje.

Zaključak

Ovim istraživanjem ukazano je da primijenjeni program nema dovoljan uticaj na korekciju posturalnih poremećaja i da jedna školska godina nije dovoljan period na osnovu kojeg bi se donosili konačni zaključci o ovoj problematici.

Ključne reči: posturalni poremećaj, korektivno vježbanje, omladina

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THE EFFECTS CORRECTIVE EXERCISES HAVE ON THE CORRECTION OF POSTURAL DISORDERS IN HIGH SCHOOL YOUTH

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Introduction

One of the tasks education and upbringing have is the positive impact on children's development and health, but the prevention of postural disorders is being neglected. For a longer period of time, it has been pointed out to a constant increase of postural disorders in children. Kovac (2000) pointed out to kyphosis, lordosis, and scoliosis as being the most frequent spine deformities in childhood, thus stating the problems of early diagnostics. Jovovic (1) concluded that in a great number of pupils the state of locomotor apparatus is at risk.

Method

The problem of the research was the effect of applied contents of corrective exercise on the correction of postural disorders of 15-year-old pupils (± 6 months), during one school year. A hypothesis was proposed: A difference in final measurement between control and experimental group was expected. The examinees were divided into two groups- experimental and control. The research was conducted at the beginning and the end of a school year. A somatoscopic method was applied- the posture was observed, in a certain sequence, through segments. If there was a deviation in frontal or sagittal plane the degree of postural deformity was detected by a plummet and ruler, and depending on the disorder, the pupils in the experiment group had a specially designed program for each pupil, with which, during the PE classes, was tried to correct the disorder by the means of corrective exercise and curriculum. The examinees in the control group exercised according to the PE curriculum. The evaluation of the effect of the program was conducted based on the following variables: kyphotic, lordotic, and scoliotic posture. The data were analyzed by a package SPSS 17.0. To obtain valid conclusions, descriptive parameters of the variables and covariance analysis were used.

Results and discussion

Based on the values of significance, no statistical significance was noticed of neither of the variables, on levels 0.01 and 0.05, i.e. there were no differences in values between the experimental and control group, it can be concluded the applied corrective exercise program had no effect on the correction of postural disorders, and the hypothesis was rejected.

Conclusion

With this research it was pointed out to the fact that the applied program did not have sufficiently strong impact on the correction of postural disorders and that a school year was insufficient period of time for a final conclusion concerning this problem to be based on.

Key words: postural disorder, corrective exercise, youth

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EFFECTS OF SPORTS GAMES PROGRAM TO THE MOTOR ABILITIES DEVELOPMENT IN PHYSICAL AND HEALTH EDUCATION

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Introduction

The goal of this work is to determine the effects of using program of the sports games to the motor abilities development during the teaching PHE (physical and health education). This program takes a period of 70 school lessons. It is made of the elementary technical-tactical elements of soccer, basketball, volleyball and handball. By numerous replicates and using through the game it should cause a positive influence on motor abilities. Based on the set aim, a hypothesis was defined: applied program will cause statistical significant changes in developing of motor abilities.

Method

The study was conducted in a sample of 50 participants, aged 12 years (+/- 6 months). The participants are male and they don't practice sport. Motor abilities were assessed with 14 variables. Sample of measurement tools assesses: flexibility (flexibility with bat and sit and reach), explosive strength (jumping forward from a place, jumping vertically from a place and running at 20m-from a high start), repetitive strength (push ups, sit ups 30s and deep squats 40s), coordination (side steps, „envelop“ test and polygon backwards), movement frequency (hand tapping and leg tapping) and endurance (beep test). Testing was done in a two-point of measuring (beginning and the end of school year). The t-test for dependent samples was used ($p < 0.05$) for determining differences between the variables. Establishing global quantitative differences was performed by canonical discriminant analysis.

Results and discussion

After the completed program, the T-test for dependent samples determined statistically significant changes at the level ($p < 0.05$) in all tests, except the tests for assessing repetitive strength (deep squats 40s, $t = -1,909$) and test for measuring flexibility (sit and reach, $t = -1.919$). The greatest changes were observed in the tests which assess explosive strength (jumping forward from a place, $t = -7.488$) and endurance test (beep test, $t = -6.692$). Differences in results between two measurements for jumping forward from a place and the beep test after implementing the exercises programs in the elementary schools were obtained by other authors (2). A discriminant function was isolated at the level ($p < 0,01$) by determining of global quantitative differences. There were some global quantitative differences in area of coordination, explosive strength, endurance and movement of frequency, but there were not any statistical significant changes in tests for estimating repetitive strength (push-ups and deep squats 40s) and flexibility (sit and reach).

Conclusion

Defined hypothesis was confirmed after applying of this program by statistically significant changes in motor abilities. There were differences after applying of sports games program caused by exercises in preparation part of PHE lesson, by using of complex forms of work and by drilling technical and tactical elements in game.

Key words: motor abilities, sports games and differences

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UTICAJ PROGRAMIRANE NASTAVE FIZIČKOG VASPITANJA NA MORFOLOŠKE I MOTORIČKE KARAKTERISTIKE UČENIKA III I IV RAZREDA OSNOVNE ŠKOLE

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Uvod

Trenutno stanje u nastavi fizičkog vaspitanja se može opisati kao nezadovoljavajuće. Posebno loše stanje odnosi se na nastavu u mlađem školskom uzrastu. Uzroci se pripisuju različitim faktorima, ali je jedan od dominantnijih što nastavu obavlja profesor razredne nastave, koji najčešće nema adekvatno obrazovanje (1). Iz toga proizilazi problem efikasnosti nastavnog procesa fizičkog vaspitanja s obzirom na način realizacije i realizatore nastavnog procesa (2), ali i hipoteza da će programirana nastava fizičkog vaspitanja pozitivno uticati na razvoj motoričkih sposobnosti učenika mlađeg školskog uzrasta.

Metod

Devedeset šest učenika je raspoređeno u dve grupe: eksperimentalnu, u kojoj je nastavu fizičkog vaspitanja vodio profesor fizičkog vaspitanja, i kontrolnu, u kojoj je nastavu vodio profesor razredne nastave. Obe grupe testirane su na početku i kraju primenjenog programa. Procenjivane su telesne dimenzije i motoričke sposobnosti korišćenjem testova za procenu gipkosti, repetitivne snage, agilnosti i spretnosti i okretnosti. Efekti programirane nastave procenjivani su analizom varijanse (ANOVA) sa ponovljenim merenjima i Kohenovim efektom veličine.

Rezultati sa diskusijom

Dobijeni rezultati ukazali su na pozitivan uticaj programirane nastave fizičkog vaspitanja u domenu gipkosti ($F=9.922$, $p=0.002$), agilnosti ($F=9.859$, $p=0.002$), spretnosti i okretnosti ($F=22.833$, $p<0.001$). Pozitivan uticaj je naročito primećen u aktivnostima sličnim sadržajima korišćenim u nastavi. Nisu utvrđene razlike u repetitivnoj snazi ($F=1.606$, $p=0.208$). Kao što je i očekivano, telesne dimenzije ne pokazuju zavisnost od primenjenog programa nastave.

Zaključak

Može se zaključiti da program i način izvođenja nastave značajno utiču na razvoj motoričkih sposobnosti. U prvi plan se ističe značaj samog fizičkog vaspitanja u opštem razvoju deteta, ali i stručnog vođenja nastave u cilju efikasnijeg rešavanja zadataka nastave.

Ključne reči: fizičko vaspitanje, programirana nastava, motorika, mlađi školski uzrast

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EFFECTS OF PROGRAMMED PHYSICAL EDUCATION CLASSES TO MORPHOLOGICAL AND MOTORIC CHARACTERISTICS OF THIRD AND FOURTH GRADE PUPILS IN ELEMENTARY SCHOOL

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Introduction

The current state of physical education classes can be described as unsatisfactory. Especially bad situation applies to the classes in the junior grades. The causes are attributed to different factors, but one that is dominant is those classes are taught by a class teacher, who often do not have adequate education (1). That is followed by problem considering the way of implementation of the teaching process (2). as well as the hypothesis that programmed classes have a positive effects to the development of motor abilities of junior grade pupils.

Method

Ninety-six pupils were divided into two groups: an experimental, in which physical education classes were led by a physical education teacher, and control, in which classes were led by a class teacher. Both groups were tested at the beginning and at the end of the applied program. Body size and motor skills were assessed by flexibility, repetitive strength, agility and coordination tests. Effects of programmed classes were evaluated using ANOVA with repeated measures and Cohen effect size.

Results and discussion

The results showed a positive impact of the programmed physical education classes in the area of flexibility ($F=9.922$, $p=0.002$), agility ($F=9.859$, $p=0.002$) and coordination ($F=22.833$, $p<0.001$). A positive effect is particularly noticeable in activities similar in content to those used in teaching. There were no differences in the repetitive strength ($F=1.606$, $p=0.208$). As it was expected, body size does not show dependence on the applied programmed classes.

Conclusion

It is concluded that the program and the way of class performing have a significant impact on the development of motor skills. Foremostly there is the emphasis of the importance of the physical education in the overall development of the child, as well as the professional class teaching in order to more efficiently solve class tasks.

Key words: physical education, programmed classes, motor skills, junior grade pupils

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BALANCE DEVELOPMENT FOR PRIMARY SCHOOL STUDENTS THROUGH ATTRACTIVE METHODS

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Introduction

Physical education holds a significant role in promoting an active lifestyle, having optimum action ways on the harmonious development of the body and motor capacities of students, in accordance with the syllabus requirements. The purpose of the research consists in selecting and applying a program of dynamic games and exercises specific to gymnastics, in order to develop the balance of 8-9-year old students and also to verify their efficiency. The hypothesis of the research: applying a program of special gymnastics exercises and dynamic games will determine the balance improvement of students.

Method

The research was carried out in the 2nd semester of the school year 2011-2012 in Constanta and included 2 groups of students aged 8 and 9. One experimental group and one control group each formed of 20 students (10 boys and 10 girls). The independent variable consisted in a program for balance development, with games and movements specific to gymnastics. Methods for measuring the balance: to make the measurement of equilibrium, we used tests adapted after 3 Flamingo test: test 1-initial position of the lifting stand up knee bent, with arms stretched sideways, eyes closed, 2 nd test of standing upright with arms stretched sideways with eyes closed; test of 3-standing upright, with arms stretched sideways, eyes closed, soles of the foot before the other.

Results and discussion

The research results show that the experimental group when compared to the control group, has made a significant statistical progress regarding balance development, both for girls and boys. The applied methodology of balance development was efficient and adapted to the particularities of the research sample.

Conclusion

The research shows that a program of games and exercises specific to gymnastics, which is adapted to age particularities and physical condition level, exercised during physical education classes, holds an optimum contribution to balance development.

Key words: physical education, balance, dynamic games, gymnastics

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INTERESOVANJA I MIŠLJENJA DECE O PROGRAMU REKREATIVNE NASTAVE

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Uvod

Rekreativna nastava predviđena je nastavnim planovima i programima osnovnog obrazovanja, ali nije uvrštena kao obavezna školska aktivnost, bez obzira na njenu značajnost. Istraživanje je imalo za cilj da stekne uvid u interesovanje dečaka i devojčica o programu rekreativne nastave.

Metod

Uzorak je činilo 222 ispitanika, od čega je bilo 110 dečaka i 112 devojčica, uzrasta 9 i 10 godina. Za potrebe ovog istraživanja primenjen je anketni upitnik, koji je sadržao ukupno 20 pitanja. Izračunavanje statističke značajnosti razlika između grupa realizovano je pomoću Hi-kvadrat testa (χ^2) nezavisnosti, pri zaključivanju na nivou značajnosti od $p = 0.05$.

Rezultati sa diskusijom

Na rekreativnoj nastavi realizuje se veliki broj aktivnosti, a boravak u prirodi dodatno povećava pozitivno dejstvo koje one imaju na dečiji organizam (1, 2). Ovim istraživanjem, ispitanici (dečaci 64.5%; devojčice 47%) su pokazali najveće interesovanje za program popodnevnih aktivnosti, statistička značajnost od 0.002 ($p < 0.05$). Od programskog sadržaja koji je sproveden na rekreativnoj nastavi ispitanicima se najviše dopalo u okviru sportskih aktivnosti, dečacima (67.3%) fudbal, devojčicama (53.6%) odbojka, statistička značajnost od 0.000. Veliko interesovanje, ispitanici oba pola (dečaci 35.5%; devojčice 50%) su pokazali za sportsku aktivnost plivanje, što se može uzeti u obzir pri realizaciji budućih programa rekreativne nastave. Na osnovu rezultata istraživanja utvrđeno je da postoje statistički značajne razlike u interesovanju u pojedinim aktivnostima koje se realizuju na rekreativnoj nastavi između dečaka i devojčica.

Zaključak

Ovim istraživanjem dobijena je povratna informacija od ispitanika o njihovim interesovanjima, mišljenju realizovanog programa, ali i njihove sugestije i inovacije koje su usaglašene sa njihovim željama. Na osnovu dobijenih rezultata može se zaključiti da program rekreativne nastave treba prilagoditi posebno za dečake posebno za devojčice koliko je to moguće. Istraživanjem dobijene informacije se mogu iskoristiti kao smernice za realizaciju budućih programa rekreativne nastave u cilju njihovog poboljšanja i u saglasnosti sa željama ispitanika.

Ključne reči: interesovanja, rekreativna nastava, dečaci/devojčice

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THE CHILDREN'S INTERESTS IN AND OPINIONS ON THE PROGRAM OF RECREATIONAL EDUCATION

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Introduction

Recreational Education is included in the elementary education curriculum, but not as an obligatory school activity, regardless of its significance. The research had the aim to gain insight into the boys' and the girls' interests in the program of recreational education.

Method

The sample of respondents consisted of 222 respondents, 110 of which were boys and 112 were girls aged 9 and 10. For the purpose of this research, the questionnaire that consisted of 20 questions in total was applied. The calculation of statistically significant difference between the groups was performed by the Chi-square test (χ^2) of independence at the conclusion of the significance level 0.05.

Results and discussion

A large number of activities is performed during the recreational education, and spending time in nature additionally increases the positive effects they have on child's organism (1, 2). According to this research, the respondents (boys 64,5%; girls 47%) showed the greatest interests in the program of the afternoon activities, statistical significance 0.002 ($p < 0.05$). From the content implemented in the recreational education, among the sports activities the respondents liked the most: the boys (67,3%) football, the girls (53,6%) volleyball, statistical significance 0.000. Great interest, the respondents of both sexes (boys 35,5%; girls 50%) showed for the sports activity- swimming, which can be taken into consideration during the realization of the future recreational education programs. The results of the research showed that there are statistically significant differences in interests in particular activities that are performed among the boys and the girls during the recreational education.

Conclusion

This research resulted in a feedback about their interests, opinions on realized program, but also their suggestions and innovations that are coordinated with their wishes. On the basis of the obtained results, it can be concluded that the recreational education program should be adapted separately for the boys and the girls as much as it is possible. The information from the research can be used as directive for the realization of the future programs of recreational education with the aim of improving them and in line with the respondents' wishes.

Key words: interests, recreational education, boys/girls

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SPORTSKO – REKREATIVNE AKTIVNOSTI UČENIKA OSNOVNIH ŠKOLA U GRADSKIM I SEOSKIM SREDINAMA U SRBIJI^{1, 2}

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Uvod

Promovisanje fizičke aktivnosti dece i mladih je težak i složen zadatak. Jedan od bitnih faktora koji može da ima snažan uticaj na rešavanju tog zadatka je fizičko vaspitanje, kao i prosvetni radnici koji predaju fizičko vaspitanje. Fizičko vaspitanje, sa tri časa nedeljno u osnovnom obrazovanju i obaveznim sportskim sekcijama, i dva časa nedeljno u srednjem obrazovanju, za pojedine učenike predstavljaju jedini izvor fizičke aktivnosti. Organizovanost nastave fizičkog vaspitanja i sportsko rekreativnih aktivnosti razlikuje se u gradskim sredinama u odnosu na seoske sredine. Potrebno je od perioda ranog detinjstva, raditi na stvaranju navike za svakodnevnim telesnim vežbanjem, na ostvarivanju potrebe za kretanjem, kao i na razvoj svesti o značaju pomenutog. Veoma veliku vrednost ima vaspitanje pravilnog odnosa prema fizičkom vežbanju i stvaranju lične odgovornosti za vlastiti učinak.

Metod

Na uzorku od 822 učenika sedmog razreda na teritoriji Republike Srbije, sprovedeno je istraživanje o angažovanosti u rekreaciji. Učenici iz seoskih sredina (opština Sečanj) čine 45% uzorka, dok su ostali iz gradskih sredina R. Srbije i čine 55% uzorka. Istraživanjem su proučavani stavovi učenika i odnos prema nastavi fizičkog vaspitanja i sportsko - rekreativnim aktivnostima u slobodno vreme. Za dobijanje rezultata korišćen je Servey metod, odnosno načinjen je transferzalni presek korišćenjem standardizovanog upitnika koji je korišćen za istraživanje Angažovanost u rekreaciji građana (1).

Rezultati sa diskusijom

Naveći procenat ispitanika je član sportskog kluba (51.37%). Ispitanici sa sela su se u najvećem procentu izjasnili da je nastava vrlo važna, u pojedinim selima, ispitanicima je nastava jedini vid fizičke aktivnosti. Rezultati istraživanja su pokazali da su ispitanici više orijentisani ka kolektivnim sportovima (rukomet 15.4%, košarka 17.57%, odbojka 24.32%, plesna grupa 10.13%, fudbal 12.97%). Osnovcima iz opštine Sečanj najviše se dopada ideja da umesto klasične nastave fizičkog vaspitanja imaju fizičko vaspitanje svaki dan po 30 minuta. Osnovci sa teritorije opštine Sečanj najviše 63.7% vežbaju redovno (barem tri puta nedeljno).

Zaključak

Rezultate koje smo dobili nam govore da su ispitanici iz seoskih sredina aktivniji od svojih vršnjaka iz Vojvođanskih gradova i Beograda i Srbije. Najčešće su ispitanici sa sela uključeni u sportske klubove 51.37%. Ispitanici iz gradskih sredina su više uključeni u školske sekcije (Beograd i Srbija u rukometu 15.14%, gimnastici 6.22%, košarci 17.57%, džudou 1.89%, odbojci 24.32%, a Vojvođani u atletici 8.82%, plesnoj grupi 10.13%), njih ima više, pa samim tim nastavnici imaju veću mogućnost i u ponudi više sekcija. Ispitanici sa sela više se bave redovno rekreacijom ili sportom 63.7% nego njihovi vršnjaci iz gradova. Ovaj podatak vezujemo za čistiju i zdravlju sredinu u seoskim sredinama.

Ključne reči: rekreacija, nastava, fizičko vaspitanje

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¹ Rad je realizovan u okviru projekta „Efekti primenjene fizike aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije Republike Srbije“ br. III47015, potprojekat “Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status školske populacije R. Srbije” koji je finansiran od strane Ministarstva za nauku i tehnološki razvoj Republike Srbije – Ciklus naučnih projekata 2011-2014.

² Rad je realizovan u okviru projekta „Unapređivanje kvaliteta i dostupnosti obrazovanja u procesima modernizacije Srbije“ br. III47008, koji je finansiran od strane Ministarstva za nauku i tehnološki razvoj Republike Srbije – Ciklus naučnih projekata 2011-2014.

SPORTS – RECREATIONAL ACTIVITIES OF THE PRIMARY SCHOOL STUDENTS IN RURAL AND URBAN ENVIRONMENTS IN SERBIA

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Introduction

Promoting of children and young people's physical activity is a very complex task. One of the most important factors with the greatest impact on solving this problem is physical education classes, as well as, the teachers of physical education. Three times a week physical education classes in primary schools and obligatory sports clubs, and twice a week classes in secondary schools are the only source of physical activities for some students. Organizing the physical education classes and sports and recreation activities is different in urban and in rural environments. It is very important to create the necessity for everyday physical exercising and the necessity for everyday moving from the earliest period of childhood. The most valuable is the education about the regular relationship towards physical exercising and creating the self-responsibility for someone's own effect.

Method

The research of students' engagement in recreation was carried out on the sample of 822 students from the seventh grade on the territory of Serbia. The 45 % of the sample were students from rural environments (the municipality of Secanj), while the others - 55% were from urban environments of the Republic of Serbia. Students' attitude and their relations towards the physical education and sports-recreational activities in their free time were studied in this research. The survey method was used for getting the results. The transverse section was made by using the standard questionnaire which was used for the research on the Citizens engagement in recreations (1).

Results and discussion

The majority of questioned persons are members of a sports club 51.37%. Most of the questioned persons from the rural environment considered physical education lectures as very important part of their life; this way of recreation is the only way of physical activities for most of them. The results showed their interest for team sports (handball 15.4%, basketball 17.57%, volleyball 24.32%, dancing group 10.13%, football 12.97%). The primary school students from the municipality of Secanj liked the idea of 30-minute physical education classes every day instead of classical lectures of physical education. The primary school students from the municipality of Secanj (63.7% of them) have training classes, at least, three times a week.

Conclusion

The obtained results show us that the questioned students from rural environment are more active than the students of the same age in urban environment, from towns of Vojvodina and Serbia- Belgrade. They are mostly members of sports clubs 51.37%. Students from urban environments are involved in school sections. There are more students in city schools and therefore teachers have bigger opportunity to offer numerous sections. (Belgrade and Serbia in handball 15.14 %, in gymnastics 6.22%, in basketball 17.57% in judo 1.89% and in volleyball 24.32% and in Vojvodina in athletics 8.82%, in dancing group 10.13%. There are more students in city schools and therefore teachers have bigger opportunity to offer numerous sections. Students from the rural environments are more active in sports or in recreation 63.7%, thanks to cleaner and healthier rural environments.

Key words: recreation, lecture, physical education

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„FITNES IZAZOV“ - PROGRAM VEŽBANJA I ISHRANE KAO MODEL PODSTICANJA NA REDOVNO VEŽBANJE¹

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Uvod

Savremeni razvoj tržišta i konkurencija u fitnessu nalažu stalnu progresiju inovacija u ponudi. Cilj modela „Fitnes izazov“ bio je promocija novog Technogym velnes sistema u klubu WellnessLand što bi za rezultat imalo njegovo prihvatanje među članovima kluba.

Metod

Na uzorku od 42 ispitanika testirali smo „Fitnes izazov“ kao model javne evidencije vežbanja i rezultata vežbanja, koji smo osmislili da bi podstakli vežbače u klubu WellnessLand da koriste novi Technogym velnes sistem. „Fitnes izazov“ se sastojao od preporučenog režima ishrane i programa vežbanja u trajanju tri meseca, koji je bio izrađen i praćen pomoću velnes sistema. Wellness System se koristi za dizajniranje individualnih programa vežbanja po potrebama pojedinačnog korisnika, na osnovu prethodno urađenih i zabeleženih testova, uz praćenje rada i realizacije kako unutar kluba tako i van njega.

Rezultati sa diskusijom

Posle tri meseca eksperimentalne primene modela javne evidencije evidentirali smo da je 11% članova kluba prihvatilo „izazov“ i redovno učestvovalo u sprovođenju programa. Do kraja programa je učestvovalo 22 vežbača. Ispitanici su bili podeljeni u dve eksperimentalne grupe u zavisnosti od individualnih potreba: prvu grupu činili su vežbači koji su radili na redukciji telesne težine a drugu oni koji su radili na mišićnoj hipertrofiji. Vežbači koji su u kategoriji redukcija telesne težine završili program do kraja, njih 17, u proseku su zabeležili poboljšanja od izgubljenih 3.8 cm u obimu struka; 3.1 cm u obimu nadkolenice; 0.7 cm u obimu nadlaktice; 2.4% masne komponente telesnog sastava, kao i poboljšanje VO_{2max} za 4 ml/min/kg. U grupi koja je radila na mišićnoj hipertrofiji do kraja programa je ostalo 5 ispitanika koji su u proseku zabeležili napredak od 1.8 cm u smanjenju obima struka; 1.6 cm u povećanju obima nadkolenice; 0.9 cm u povećanju obima nadlaktice; 1.8% smanjenja masne komponente telesnog sastava; kao i poboljšanje VO_{2max} za 5.6 ml/min/kg. Danas, godinu dana nakon sprovedenog projekta „Fitnes izazov“, 45% aktivnih klijenata kluba koristi Technogym velnes system.

Zaključak

„Fitnes izazov“ kao model javne evidencije je postigao svoj osnovni marketinški efekat da vežbači u klubu prihvate novi Technogym velnes sistem koji nudi nove programske mogućnosti, viši nivo usluga koje imaju i veću cenu od dosadašnjih programa, jer se zasniva na softverskom povezivanju postojećih sprava i preporuka vežbanja.

Ključne reči: rekreacija, fitnes izazov, model javne evidencije, velnes sistem

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“FITNESS CHALLENGE” – A MODEL OF EXERCISE AND NUTRITION PROGRAM THAT ENCOURAGES CLUB MEMBERS TO EXERCISE REGULARLY

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Introduction

Modern market development and competition in fitness, require constant progress and innovation. The objective of the “Fitness Challenge” was to promote the new Technogym wellness system in the club Wellness Land, which would result in its acceptance among club members.

Method

In a sample of 42 club members, we tested “Fitness Challenge” as a model of public records and the results of training exercises, designed to encourage club members, in the club Wellness Land, to use the new Technogym wellness system. “Fitness Challenge” was designed and monitored by wellness system and comprised recommended diet and exercise program for three months. Wellness System is a tool used for designing individual exercise program according to the needs of users, based on performed and recorded tests, and monitored fitness activities, both within the club and outside.

Results and discussion

After three months of the experimental model implementation, public records showed us, that 11% of club members accepted the “challenge” and regularly participated in the program realization. 22 participants have completed the program. The participants were divided into two experimental groups according to their fitness goals: the first group, were the exercisers who had been working on the reduction of body weight and the second group were once working on muscle hypertrophy. 17 participants involved in a category of weight loss program, completed the challenge. On average, they showed an improvement from the loss of 3.8 cm in waist circumference, 3.1cm in thighs, 0.7cm in the upper arm, 2.4% fat component of body composition, as well as improving VO₂max for 4ml/min/kg. 5 participants, in the group that worked on muscle hypertrophy, completed the program and recorded an average improvement of 1.8 cm reduction in waist circumference, 1.6 cm in increasing thighs volume, 0,9cm increase in arm circumference, 1.8% reduced fat components of body composition, as well as improving the VO₂max of 5.6 ml/min/kg. Today, one year after the completion of the “Fitness Challenge”, 45% of active clients using Technogym wellness club system.

Conclusion

“Fitness Challenge” as a model of public records, has achieved its primary marketing target. Exercisers in the club accepted new Technogym wellness system, as it offers new program opportunities, higher level of service and increased membership value. All this is because it is based on the clever software solutions, connecting all fitness equipment and exercise recommendations.

Key words: recreation, fitness challenge, a model of public records, wellness system

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VALORISATION (EVALUATION) OF SPORTS AND RECREATIONAL ACTIVITIES OF THE MOUNTAIN VODNO ACCORDING TO GEOGRAPHICAL CONDITIONS IN A GROUP OF MOUNTAINEERS

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Introduction

The return of people to the mountains has vital importance because they are hideouts of silence, which is increasingly threatened as a result of modern lifestyles (1). The need for evaluation of sports and recreational activities is logical according to their influence on the condition of the dimensions of anthropological status, especially because it is required by the current conditions of socio-economic development (2). The aim of this research consists of determining the valuation and the importance of sports and recreational activities on the mountain Vodno, according to the opinion of mountaineers from mountaineering clubs in Skopje and based on geographical position as a criterion. Hypothesis are confirmed with the fact that there are groups of several activities that are highly ranked, average and low valorised.

Method

For the purposes of this research 37 recreational activities were valorised. Assessment of the value and importance of sports and recreational activities, was carried out by 100 respondents surveyed - mountaineers from Skopje. For the given grades surveyed group (assessors) for each sports activity for a given criterion calculated arithmetic environments, SD and variance. Then we calculated standardized scores "Z" value for each grade, for every sport and recreational activity and then their average "Z"-values were calculated. Among the scores of each evaluator given for each sport and recreational activity correlation coefficient were used, which determines the objectivity of the evaluators.

Results and discussion

In the first part one group of very highly evaluated sports activities can be set aside ranging from number 1 to number 7. It includes: hiking, mountain biking, cycling, paragliding, orientation running, sports climbing and alpinism. The differences between these recreational activities are quite small. Field values of Z values ranged from 1.14 to 0.72. In the next group of sports and recreational activities, is a larger group that according to their Z values ranged from 0.31 to -0.43. As the lowest evaluated or evaluated activities according to the geographical location of the mountain Vodno are the activities with average Z values from -0.55 to -0.90. The condition of the correlation coefficients for geographical criterion shows that all correlation coefficients, with the exception of three assessors in a given geographic criteria are statistically significant at the level of 0.05 (all ratios that are higher than 0.31 are statistically significant at the level of 0.05). It is enough to say that evaluators objectively assessed the sporting activities. Mountaineering predictably took the top of the list. This activity, the media did not register and the activities on the mountain allow mental and physical balance for the urbanized citizen (2)

Conclusion

As the highest evaluated or ranked sports and recreational activities can be distinguished mountaineering, mountain biking, cycling, paragliding, orientation running, sports climbing and alpinism. According to the achieving of the climatic and geographical opportunities high ranked sports and recreational activities offer the opportunity for inclusion as additional incentives that are attractive to visitors of Mount Vodno.

Key words: valorisation, mountains, hiking, mountain biking.

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EFFECTS OF A GROUP-EXERCISING PROGRAM ON MOTOR AND FUNCTIONAL ABILITY WITH FEMALES

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Introduction

Lot of authors have already demonstrated the positive changes in several dimensions of the anthropological status using modern aerobic dance programmes as experimental program. Special morphological space of female dancers was explorative induced by different treatments of modern aerobic dance programmes. The aim of this research was to establish efficacy of combination step aerobics and HIIT training on changes in the motoric (repetitive strength, static strength, flexibility and coordination) and functional ability measures of female participants.

Method

The population from which the sample was obtained for the research was defined as a population of female aged 22 to 40. The experimental program of the recreational exercise model was realized three times a week for a period of three months, and the duration of each individual exercise was 60 minutes. Step aerobic exercise was realized two times, HIIT training was realized one time at week. The basic descriptive statistical parameters were calculated for all of the results, and the difference between repeated measurements was determined by multivariate (MANOVA) and univariate analysis of variance (ANOVA).

Results and discussion

A statistically significant difference was found to exist between the repeated measurements of the female participants (Wilk's Lambda=0.37; p=0.00). Positive and most statistically significant difference was found in final measuring on regards of the applied variables motoric measures (repetitive strength, static strength, flexibility and coordination) and functional abilities too.

Conclusion

The obtained results confirmed that combination of the step aerobics and HIIT training exercise producing a lot of positive changes in the motoric and functional abilities of the female participants. Further investigations with more differences experimental groups and programs could give precisely results about real effects.

Key words: step aerobics, HIIT training, motor abilities, transformational effects

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DIFFERENCES OF COORDINATION IN RELATION TO SEX, AGE AND PHYSICAL ACTIVITY IN YOUNGER STUDENTS

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Introduction

Coordination is the least studied of motor skills. Responsibility for the lack of research lies in poor understanding of how CNS functions, whose maturation significantly influences development of coordination. Therefore, researched issue in this study is analysis of test result differences for coordination estimation of junior school age children in relation to sex, age and physical activity. The subject of this study is ability of motor coordination. The aim is to determine if there are differences in test results for coordination evaluation of junior school age children in relation to sex, age and physical activity.

Method

The survey was conducted on a sample of 132 junior school age children. Criterion variables in this study were: gender, physical activity, age of respondents; and predictors were: dribbling hand, legs slalom with two balls, crawling and jumping, the eight with inclination, polygon backwards and side steps. Methods of theoretical analysis and descriptive methods are used. The results were analyzed by using descriptive and comparative statistics. Statistical data analysis was performed by using SPSS statistical software (17.0).

Results and discussion

Comparative statistics showed that male subjects achieved better results on tests for lower extremity coordination evaluation, while female respondents showed better results in the ability of dynamic stereotypes reorganization. It was also concluded that subjects who engage in any form of sport activities have better hand coordination, the ability of dynamic stereotypes reorganization, whole body coordination, and agility. It is determined that if characteristic of motor abilities are familiar, conditioned by biological and chronological maturation, will make easier choice and application of appropriate teaching methods and forms of work, which will have the most success in motor skills development.

Conclusion

Therefore if this study results applied in practice, planning and programming of physical education classes would be easier, as well as choice of methods and organizational work forms with junior school age children.

Key words: coordination, gender, age, physical activity

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UTICAJ RAZLIČITIH SPOLJAŠNIH POV RATNIH INFORMACIJA NA MOTORNO UČENJE

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Uvod

Sva motorna učenja koja čovek usvaja tokom života se procesuiraju pomoću unutrašnjih ili spoljašnjih (augmented feedback) povratnih informacija. Spoljašnje povratne informacije se mogu davati pre započinjanja motornog zadatka, tokom izvođenja i nakon njegovog završetka. Najčešće vrste spoljašnjih informacija koje se koriste u eksperimentima motorne kontrole su „znanje rezultata“ (KR) i „znanje izvođenja“ (KP). Cilj ovog istraživanja je određivanje spoljašnjih povratnih informacija koje omogućavaju najbrže motorno učenje i najduže zadržavanje naučene motorne veštine u zavisnosti od složenosti motornog zadatka kod zdravih osoba.

Metod

U radu je primenjen metod teorijske analize, deskriptivni i komparativni metod istraživanja. Predstavljena su relevantna znanja iz oblasti motornog učenja koja su interpretirana teorijskim putem, na osnovu čega je predložen inovativni pristup u analiziranju i primeni povratnih informacija.

Rezultati sa diskusijom

Novija istraživanja dokazuju da su za osobe koje vežbaju neku novu motornu veštinu mnogo korisnije povratne informacije koje se odnose na strukturu izvođenja pokreta, „znanje izvođenja“ (KP) nego „znanje rezultata“ (KR). Zbog čega se češće koriste povratne informacije (KR) nego (KP) nekog motornog zadatka? Razlog je verovatno zato što se informacije koje se odnose na (KR) mnogo lakše mere i preciznije je moguće utvrđivati napredak svakog pojedinca tokom nekoliko pokušaja. Poslednjih godina sa razvojem sve sofisticiranije tehnologije moguće je precizno snimati vršenje određenih pokreta, sprovesti detaljnu i preciznu biomehaničku analizu shema pokreta, što omogućava veću primenu povratnih informacija (KP).

Zaključak

Iz analiziranih istraživanja se može zaključiti da sve vrste spoljašnjih povratnih informacija utiču na poboljšanje izvođenja složenijih ili jednostavnijih motornih zadataka ispitanika ali ipak postoje značajne razlike u vrednostima poboljšanja. U svim navedenim studijama je dokazano da spoljašnje povratne informacije (KP) bolje utiču na poboljšanje lakših i težiš motornih zadataka. U navedenim studijama se taj fenomen objašnjava najčešće posledicom razvoja sopstvenog mehanizma detekcije i korekcije grešaka. Razvojem tih mehanizama se dobijaju informacije sheme motornog obrasca, tj. koji deo sheme pokreta treba menjati kako bi se poboljšao rezultat u određenom zadatku (preciznost, dužina hica...).

Ključne reči: motorno učenje, motorni zadaci, povratna informacija

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IMPACT OF VARIOUS EXTERNAL FEEDBACK IN MOTOR LEARNING

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Introduction

All motor learning that man acquires during life is processed by using internal or external feedback. External feedbacks can be given before starting the motor task, during the performance and after its completion. The most common types of external information used in motor control experiments are „knowledge of results“ (KR) and „knowledge of performance“ (KP). The aim of this research was to determine the external feedback that enables the fastest motor learning and the longest keeping of learned motor skills depending on the complexity of the motor task in healthy persons.

Method

In this study the method of theoretical analysis, descriptive and comparative research methods were used. Relevant knowledge in the field of motor learning that is interpreted theoretically was analysed and systematized, on which base and innovative approach in applying external feedback was proposed in order to allow the fastest motor learning and the longest keeping of learned motor skill.

Results and discussion

Recent research proves that for persons who exercise a new motor skills are more useful feedback related to the structure of the movement performance „knowledge of performance“ (KP) than „knowledge of results“ (KR). Why is feedback (KR) of a motor task more often used than (KP)? The reason is probably because information relating to (KR) is easier to measure and it is more precise to determine progress of each individual during several attempts. In recent years, with the development of increasingly sophisticated technology it is possible to precisely record the performance of certain movements, implement detailed and precise biomechanical movement analysis scheme, allowing greater use of feedback (KP).

Conclusion

From the above study it can be concluded that all types of external feedback affect improving of the performance of complex or simple motor tasks of responders, but there are significant differences in the improvements. In all these studies it is shown that external feedback (KP) has a better impact on the improvement of easier and more difficult motor tasks. In above mentioned studies this phenomenon is usually explained by development of its own mechanism of detection and correction of errors. With development of mechanism information scheme of motor form are obtained, i.e. which part of the movement scheme should be changed in order to improve the result in particular task (precision, the length of the shot..)

Key words: motor tasks, external feedback, knowledge of results, knowledge of performance

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EFEKTI RAZLIČITE VRSTE TRENINGA NA PARAMETRE IZOMETRIJSKOG GRADIJENTA MIŠIĆNE SILE OPRUŽAČA NOGU KOD ODBOJKAŠICA

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Uvod

Odbojka, kao sportska igra, je karakteristična po velikoj zastupljenosti kratkih i brzih kretanja uz značajan broj različitih vrsta vertikalnih skokova. Samim tim, trenažni rad sa aspekta opšte i specifične fizičke pripremljenosti je dominantno usmeren na poboljšanje kontraktilnih karakteristika mišića opružaća nogu. Cilj rada je da objasni efekte kombinovanog pliometrijskog metoda treninga tokom četvoronedeljnog predtakmičarskog mezociklusa na parametre gradijenta prirasta sile.

Metod

Tri grupe različito treniranih sportistkinja su učestvovala u istraživanju: eksperimentalna grupa (N=12), grupa klasično treniranih odbojkašica (N=8) i kontrolna grupa (N=20). Testovi "Polučučanj" i "Podizanje na prste" su realizovani u izometrijskim uslovima sa ciljem da se analiziraju nivo maksimalne mišićne sile F_{max} , vreme potrebno da bi se razvila maksimalna mišićna sila (ms) - tF_{max} , opšti gradijent prirasta mišićne sile - $RFD_{F_{max}}$, kao i gradijente mišićnih sila realizovanih na 100ms, 180ms, 250ms od početka mišićne kontrakcije, kao i na 50% od njene maksimalne vrednosti.

Rezultati sa diskusijom

MANOVA je dokazala statističke razlike između grupa ispitanica na inicijalnom (Wilk's Lambda = 0.044; $F=10.608$; $p=0.000$) i finalnom merenju (Wilk's Lambda=0.032; $F=12.764$; $p=0.000$). Eksperimentalna grupa je poboljšala gradijent mišićne sile realizovan na 100ms, 180ms, 250ms od početka mišićne kontrakcije, kao i na nivou 50% i 100% od maksimalne mišićne sile u poređenju sa $GROUP_{CLASS}$ i $GROUP_{CONTROL}$ i u slučaju mišića opružaća nogu i opružaća skočnog zgloba.

Zaključak

Rezultati su definisali dominantne faktore eksplozivne mišićne sile – gradijent maksimalne mišićne sile opružaća nogu i skočnog zgloba, kao i gradijent mišićne sile opružaća nogu realizovan na 250 ms od početka mišićne kontrakcije. Specijalan model treninga povećao je eksplozivnost eksperimentalne grupe ($GROUP_{SPEC}$) za 87% u odnosu na klasično treniranu grupu ($GROUP_{CLASS}$) i za 35% u odnosu na kontrolnu grupu.

Ključne reči: pliometrija, opružaći nogu, opružaći skočnog zgloba, gradijent mišićne sile, odbojka.

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EFFECTS OF DIFFERENT TRAINING METHODS ON ISOMETRIC RATE OF FORCE DEVELOPMENT PARAMETERS OF LEG EXTENSORS IN FEMALE VOLLEYBALL PLAYERS

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Introduction

Modern volleyball game consists of numerous short, explosive moves and different types of vertical jumps. Therefore, training procedures from the perspective of basic and specific physical preparation are primarily focused on muscle contractile capacity characteristics enhancement of leg extensors. The aim of this study is to verify the effects of combined method of training during 4-week pre-competitive cycle on different parameters of isometric rate of the force development of tested muscle groups.

Method

Three groups of differently trained athletes were submitted: the experimental group (N=12) classically trained group (N=8) and control group (N=20). The "Standing Leg Extension" and "Rise on Toes" tests were conducted in isometric conditions in order to evaluate: the level of the maximal muscle force developed in Newton (N) - F_{max} , time necessary to reach the maximal force in milliseconds (ms) - tF_{max} , the rate of force development at F_{max} - RFD_{Fmax} , also analyzed at 100ms, 180ms, 250ms from the onset of muscle contraction, and 50% of its maximal result.

Results and discussion

MANOVA demonstrated differences between the groups at initial (Wilk's Lambda = 0.044; F= 10.608; p=0.000), and final test (Wilk's Lambda=0.032; F=12.764; p=0.000). Specially trained group enhanced rates of force development reached at 100ms, 180ms, 250ms from the onset of the muscle contraction, as well as at 50% and 100% of the maximal force in comparison to the $GROUP_{CLASS}$ and $GROUP_{CONTROL}$ in case of leg extensors and calves.

Conclusion

Results defined dominant factors of explosive force - maximal rates of force development of leg extensors and calves, and rate of force development of leg extensors reached at 250ms. Specific model of training enhanced the explosiveness of $GROUP_{SPEC}$ by 87% comparing to $GROUP_{CLASS}$ and by 35% towards $GROUP_{CONTROL}$.

Key words: plyometric training, leg extensors, calf muscles, isometric Rate of Force Development, volleyball

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USPEŠNOST USVAJANJA OSNOVNE TEHNIKE SKIJANJA U ODNOSU NA MORFOLŠKE KARAKTERISTIKE DECE

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Uvod

Za uspeh u alpskom skijanju, između ostalih karakteristika neophodna je i odgovarajuća kombinacija morfoloških obeležja. Brojna istraživanja su utvrdila povezanost morfoloških karakteristika sa uspehom u takmičarskom skijanju, ali je značajno onih koja bi istraživala uticaj morfoloških karakteristika kod skijaša početnika.

Metod

Istraživanje je sprovedeno na uzorku od 100 ispitanika, dece uzrasta 5-8 godina koja nikad ranije nisu skijala, sa ciljem da se utvrde razlike u uspešnosti usvajanja osnovne tehnike skijanja u odnosu na morfološke karakteristike ispitanika. Nakon sprovedene šestodnevne obuke, uspešnost izvođenja osnovne tehnike skijanja je ocenjena ekspertskom ocenom od strane tri nezavisna ocenjivača. Za potrebe procenjivanja usvojenosti odabrana su tri elementa tehnike: zaustavljanje u plugu, zaokret ka padini, vijuganje oko postavljenih markacija. Morfološke karakteristike ispitanika procenjene su na osnovu izmerene visine tela, mase tela, debljine kožnog nabora nadlaktice, obima natkolenice i izračunatog BMI. Od statističkih analiza primenjene su multivarijantna analiza varijanse (MANOVA), diskriminativna analiza i Roy-ev test.

Rezultati sa diskusijom

Rezultati kod ispitanika uzrasta 5 i 6 godina ukazuju na postojanje statistički značajne razlike u uspešnosti usvajanja osnovne tehnike skijanja u odnosu na varijable masa tela ($F=6.580$, $p=0.003$) i obim desne natkolenice ($F=2.742$, $p=0.075$). Ispitanike sa najmanim vrednostima mase tela, obima desne natkolenice i debljine kožnog nabora nadlaktice karakteriše da su manje uspešno usvojili osnovnu tehniku skijanja, dok su najuspešniji ispitanici imali srednje vrednosti navedenih varijabli. Rezultati kod ispitanika uzrasta 7 i 8 godina ukazuju na postojanje statistički značajne razlike u uspešnosti usvajanja osnovne tehnike skijanja u odnosu na varijablu masa tela ($F=2.548$, $p=0.088$), dok kod ostalih varijabli uočena razlika nije statistički značajna.

Zaključak

Masa tela se izdvojila kao najznačajnija varijabla, kod uzrasta 5-6 godina srednje vrednosti TM značajno doprinose uspehu usvajanja a ne veće kao kod skijaša u pojedinim takmičarskim disciplinama, dok kod 7-8 godina veće vrednosti TM doprinose uspešnosti usvajanja osnovne tehnike skijanja. U ovom istraživanju kao statistički značajne na uspeh usvajanja izdvojile su se one morfološke karakteristike koje su tokom odrastanja podložnije uticaju sredine (volumen tela, masa i debljina kožnog nabora), a ne karakteristike koje su pretežno genetski determinisane (logitudinalna dimenzionalnost skeleta).

Ključne reči: alpsko skijanje, deca, morfološke karakteristike

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SUCCESSFULNESS OF ADOPTING THE BASIC SKI TECHNIQUE WITH REGARD TO CHILDREN'S MORPHOLOGICAL CHARACTERISTICS

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Introduction

For success in alpine skiing, adequate morphological characteristics are necessary. Numerous researches confirmed the connection between the certain morphological characteristics and the success of competitors in alpine skiing. Significantly less studies were orientated toward the investigation of morphological characteristics important for the process of learning alpine skiing.

Method

This research was conducted with 100 participants, children aged 5-8 years, all ski beginners. The goal of the research was to determine the possible differences in successfulness of adopting the basic ski technique with regard to children's morphological characteristics. After completing the six days training, the successfulness of performing the basic elements of the ski technique was determined through the following tasks: stopping in a snow-plough, uphill turn and turns around the posted marks by three independent judges. The assessment of morphological status was conducted by measuring the body mass, body height, triceps skin folds, tight circumference of right leg and body mass index. Results were analyzed by the multivariate analysis of variance (MANOVA), discriminate analysis and Roy's test.

Results and discussion

The results among the participants aged 5-6, show significant differences in success of adopting basic ski technique in regard to the results of body mass ($F= 6.580$, $p=0.003$) and tight circumference of right leg ($F=2.742$, $p=0.075$). The participants with the lowest results of body mass, tight circumference of right leg and triceps skin folds also less successfully adopted the basic ski technique, while the participants who successfully adopted the basic ski technique had medium results of these variables. The results among the participants aged 7-8, show significant differences in success of adopting basic ski technique in regard to the results of body mass ($F=2.548$, $p=0.088$), while no significant differences in success of adopting basic ski technique were found in other examined morphological variables.

Conclusion

The body mass distinguished as dominant variable for the success of adopting basic ski technique. In children aged 5-6 years, medium values of body mass have significant influence on the successful adoption of basic ski technique (not higher values of body mass as in elite alpine skiers), but in children aged 7-8 years higher values of body mass contributed to successfulness of adoption of basic ski techniques. In this research, morphological variables which are during the children development more under the influence of environment (volume of the body, body mass, skinfold thickens) then the one which are more genetically predisposed (as longitudinal dimension of the skeleton) distinguished as statistically significant on the successes in adopting basic ski technique.

Key words: alpine skiing, children, morphological characteristics

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THE INFLUENCE OF MODERN TECHNOLOGY ON THE EFFICIENCY OF THE SERVE IN VOLLEYBALL

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Introduction

Using modern technology is an ongoing concern for specialists, especially in high performance sports. The analysis of all technical elements in volleyball with the aid of DATA - VOLLEY 2007 software during matches leads to the objective measures regarding the efficiency of the final score. We hypothesised that the statistical and mathematical analysis during the game of volleyball can positively affect the end of the game.

Method

The subjects of the study are two volleyball players, team members of CSU MEDICINE: Katarina Jovanovic (22-years outside hitter) and Roxana Ivanof (29 years-middle hitter). In this study we observed the evolution of serve over four matches in The National Championship 2011-2012, these matches being the most important in the championship. The statistical and mathematical method as well as graphical methods were used in row data's analysis.

Results and discussion

In the four matches played, middle blocker Katarina Jovanovic served 59 times, of which 6 were errors (10.16%), 10 aces (16.5%), with an efficiency of 74.25%. 30% were serves that could aid the attack phase of the opponents and 31.3% were difficult serves, which could not aid the opponents in building an attack phase. Roxana Ivanof had 39 serves, of which 2 (5.12%) were errors, 6 were aces (15.38%), with an efficiency rate of 78%. The opponents could advance to the attack phase in 31% of the serves, while 31.5 % of the serves did not allow the opponents to build an attack phase.

Conclusion

The statistical and mathematical analysis of the serve during the volleyball game, favours the change of the game dynamics and its orientation towards the less well-trained players in the opponents' court.

Key words: volleyball, service, technology

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ОПШТИ ПАРАМЕТРИ *TRACKING MOTION* АНАЛИЗЕ ИГРАЧА ФК ЦРВЕНА ЗВЕЗДА ТОКОМ УТАКМИЦЕ 3. КОЛА КВАЛИФИКАЦИЈА ЗА ЛИГУ ЕВРОПЕ 2012/13

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Увод

Софтверско праћење и анализа података о кретању играча током фудбалског меча постали су важно дијагностичко-аналитичко средство за праћење функционалности и ефикасности играча у модерном фудбалу. Циљ овог истраживања био је да се утврди обим и структура кретања играча ФК Црвена Звезда, током утакмице 3. кола квалификација за Лигу Европе.

Метод

За снимање утакмица системом BioIRC Tracking Motion, коришћене су две идентичне видео камере Sony NEX-VG10, у full-HD резолуцији, и једна контролна камера са high speed перформансама. Алгоритамски део софтвера за обраду видео снимака, тј. за праћење кретања играча, заснивао се на утврђивању мере сличности статистичке дистрибуције боје објеката. За потребе овог истраживања приказаћемо резултате кретања играча Црвене Звезде током утакмице квалификација за Лигу Европе ФК Црвена Звезда – FC Bordeaux.

Резултати са дискусијом

Резултати кретања играча ФК Црвена Звезда, током мечева Евролиге праћених сопственим софтвером, као и анализе добијених података су у циљу сврсисходности и значајности приказа компарирани са резултатима кретања играча током Лиге Шампиона у сезонама 2011/12 и 2012./13. Просечно кретање свих играча током првог полувремена је било 4413.80m са стандардном девијацијом 2401.598m, а током другог полувремена 4488.93 m са стандардном девијацијом 1736.81m. Средње кретање током целе утакмице је било 13688m са стандардном девијацијом 4025.11m. Софтверско праћење кретања играча представља значајан систем информација за тренере и експерте из области спортске науке у стварању и усмеравању тренажних садржаја и стимулуса са крајњим циљем достизања модалних вредности у структури кретања играча на утакмици.

Закључак

Резултати софтверског праћења и анализе кретања играча током фудбалске утакмице квалификација за лигу Европе 2012/13. године, показали су да играчи Црвене Звезде обимом свог кретања на утакмици квалификација за Лигу Европе, против француског Bordeaux-а значајно превазилазе просечне вредности обима кретања у европским такмичењима (Лига Шампиона и Лига Европе). Ова метода анализе података о кретању играча представља значајан систем информација за тренере и експерте из области спортске науке у стварању и усмеравању тренажних садржаја и стимулуса са крајњим циљем достизања модалних вредности у структури кретања играча на утакмицама у врхунском фудбалу.

Кључне речи: софтверско праћење, фудбал, структура кретања играча

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GENERAL PARAMETERS OF THE *TRACKING MOTION* ANALYSIS OF FC “RED STAR” PLAYERS DURING THE MATCH WITHIN THE THIRD QUALIFYING ROUND FOR THE EUROPA EUROPE LEAGUE 2012/13

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Introduction

Software tracking and analysis of the data on the motion of players during a football match have become an important diagnostic and analytic tool for the tracking of the players' functionality and efficiency in modern football. The purpose of this study was to determine the scope and structure of the motion of FC “Red Star” players, during the match in the third qualifying round for Europa League.

Method

For recording the matches with the system BioIRC Tracking Motion, two identical Sony NEX-VG10 video cameras in full-HD resolution have been used, as well as one control camera with high speed performances. Algorithmic part of the software for video editing, i.e. for tracking of players' motion, was based on determining the level of similarity of the objects' color statistical distribution. For the purposes of this study, we will present motion results of “Red Star” (RS) players during the qualifying match for Europa League, FC “Red Star”–FC Bordeaux.

Results and discussion

Results of the of RS players' motion, during Europa League matches monitored by our own software, as well as the analysis of the obtained data, have been compared to those of the players' motion during Champions League, season 2011/12 and 2012/13, for the purpose of usefulness and significance of the reviews. The average motion of all players during the first half-time is 4413.80m with a standard deviation of 2401.60m, and during the second half-time it is 4488.93 m with a standard deviation of 1736.81m. The average motion during the whole match is 13688m with a standard deviation of 4025.11m. Software tracking of players' motion represents a significant information system for trainers and experts from the field of sports science in the creation and direction of training contents and stimuli with the ultimate goal of reaching the modal values in the structure of the players' motion during a match.

Conclusion

The results of the software tracking and analysis of players' motion during the qualifying football match for Europa League 2012/13 have shown that RS players, with the scope of their motion during the qualifying match for the Europa League against French Bordeaux, considerably exceed the average values of the scope of the motion in European competitions (Champions League and Europa League). This method of analysis of the data on players' motion represents a significant information system for trainers and experts from the field of sports science in the creation and direction of training contents and stimuli with the ultimate goal of reaching the modal values in the structure of players' motion during high class football matches.

Key words: software tracking, football, structure of players' motion

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THE USE OF INFORMATION TECHNOLOGY FOR THE REAL-TIME IMPROVEMENT OF THE EFFICIENCY OF THE VOLLEYBALL GAME ACTIONS

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Introduction

The dynamics of the volleyball game on a high performance level by introducing the information technology effectively contributes to the improvement of the individual technical and tactical actions and to obtaining positive results. The hypothesis of the study: based on the presumption that a statistical and mathematical analysis during the volleyball games regarding the evolution of the individual and collective technique, using the Data Project program, with the Data Volley 2007 Professional software, the evolution of the performance can be optimized in the future games.

Method

The study aimed the CSU Medicina Mures team, A division, the National Cup 2012. The research methods that were used: the record method, the statistical and mathematical method using the Data Volley 2007 software and the graphical method.

Results and discussion

In the initial phase of the research, the results of the unique tour game with Piatra Neamt were: 106 serves with a 55% efficiency, wherefrom 14 aces (13%) and 21 (20%) wherefrom an offense was built and 34 (32%) failed, 83 receptions of the ball from service, 64% efficiency, wherefrom 19% an offense was built and 22% failed; 105 attacks, 32% efficiency. After optimizing the preparation based on the results provided by the information programme and by changing the preparation strategy, the results that were recorded in the return match were superior, emphasized by: 101 serves, 57% efficiency wherefrom 10% aces, 17% serves wherefrom an offense was built and 33% failed services, 67 receptions of the ball from service with a 67% efficiency wherefrom 22% an offense was built and 19% failed; 98 offenses, 32% efficiency.

Conclusion

The data provided by the software determined the modification of the game strategy and the real-time improvement of the individual and collective performances, therefore the development of the efficiency by 5% in service and by 3% in offense was recorded in the return match.

Key words: informational technology, volleyball, service, efficiency

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MODERN ORIENTATIONS ON KINETIC METHODS TO RECOVER ADULT ATHLETES

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Introduction

This study started from the idea that the changing intervention of the femoral head can't be done with minimal incision and the correct application of the physical kinetic treatment could release the patient from the intervention but if the surgery happens the correct kinetotherapy rushes the functional recovery of the patient. And so kinetotherapy becomes a necessity in the recovery by kinetic methods of these traumas that are more frequent every day. The therapy by movement, "kinetotherapy's" development over the centuries based on the mutual relation between practice and observation. Meanwhile kinetotherapy built the theoretical bases by the application of the physics laws, the neuro – physiology and the musculo – articular medicine, making its own laws and becoming a science. So athletes have a lot to gain because with the help of the contemporary technology the recuperation begins a few hours after the surgery and like this it cuts up the downtime and the stiffness.

Method

The research sample included 10 adult athletes divided in two groups: group one with 5 adult athletes who needed a specific kinetic recovery program and group two with 5 adult athletes who needed surgery and postoperative kinetic treatment specifically applied after the surgery. The research took place February 2011 to March 2012. Research methods: medical history, observation, anthropometry, statistical and mathematical, graphics.

Results and discussion

Functional gain expressed in percentages on patients / athletes who did not require surgery but kinetic treatment with an average of 22.35%. Functional gain expressed in percentages on patients / athletes who required surgery and post – operative kinetic treatment with an average of 48.2%. The functional gain of the second sample is relative with the first one of 22.35% which means that kinetic recovery program was effective and timely applied.

Conclusion

Kinetic recovery programs for athletes in age – appropriate interventions applied right after as modern orientation becomes the main tool in achieving the objectives concerned: to fight the pain, to achieve the mobility and especially the hip joint stability.

Key words: kinetotherapy, sport, recovery

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STUDY REGARDING THE UNITARY EFFICIENCY OF THE SERVICE RETURN IN TENNIS

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Introduction

In the era of offensive tennis, when technique and methodology evolved extremely, when game surfaces do not allow the player to remain on the bottom of the field, but to gain an advanced position to the net, the old role of the service has been outrun, today being included in the category of crucial attack serves. The accuracy of the service and of the service return has consequences on the scoring evolution. The hypothesis of the research started from the assumption that unitary exercise of the service and service return, in conditions appropriate to the ones specific to games and based on specific methodology, determines an improvement of efficiency indices during the games.

Method

The research consisted of two testing and was carried out between February and August 2012, on three sportsmen from the "Dinamo Club"; it had six training mesocycles. The independent variable was constituted from the methodology specific to the unitary training of the service and service return. The used methods were: the experiment, tests, statistics, and graphics. Tests: 1st serve: 20 executions on service box number 1, 2 and 3, right, left with flat, slice effect; 2nd serve: 20 alternative executions with slice, lift effect; 3rd serve: service return cross, right, left and median, in circles with a diameter of 1.5m.

Results and discussion

The efficiency increase for the sportsman O.H. was: for the 1st set, 10% for the strokes on the right, 11,7% for the ones on the left, for the 2nd set efficiency increased with 10% on all technical actions and for the return cross: 5% for executions on the right and median, 10% on the left. The sportsman M.R. registered the following efficiency increase: for the 1st set: 11.7% for executions on both sides, for the 2nd set 7.5% increase and for the return cross: 5% on the right and median and 10% on the left. The efficiency of sportsman S.T. improved with 8.3% on the right and 15% on the left for the 1st set and 5% for the 2nd set and return cross.

Conclusion

The service and service return represent complementary attack actions which have to be dealt with in a unitary manner, during the training process of juniors, their efficiency being significant for the positive evolution of results.

Keywords: service, service return, efficiency, unitary training

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UTICAJ ELEMENTA TEHNIKE VOĐENJE LOPTE NA REZULTAT U PROTOKOLIMA ZA PROCENU AGILNOSTI

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Uvod

Fudbalske veštine, koje se delom ogledaju kroz tehniku vođenja lopte, neodvojiv su deo specifičnih kretanja i jedna od centralnih komponenti identifikacije i razvoja mladih igrača (1, 2). Cilj ove studije je da se utvrde odnosi između rezultata različitih testova agilnosti, kako bez, tako i sa loptom, kao i evaluacija hipotetskog konstrukta pod nazivom indeks veštine.

Metod

Testiranjem je obuhvaćeno 158 fudbalera, polaznika letnjeg kampa FK Partizan podeljenih po uzrastima od 9 do 15 godina. Primenjena su dva testa agilnosti: Zig-zag test i Slalom test. Oba testa izvođena su i bez i sa loptom. Na osnovu relativne razlike rezultata u testovima sa loptom u odnosu na rezultate bez lopte, dobijeni su indeksi veštine ispitanika sa svaki test posebno.

Rezultati sa diskusijom

Rezultati korelacione analize su pokazali umerenu, ali statistički značajnu, korelaciju između rezultata testova agilnosti sa i bez lopte ($r=0.80$, odnosno 0.71 , $p<0.001$), a nisku, ali statističku značajnu korelaciju između indeksa veština ($r=0.51$, $p<0.001$). Takođe, uočena je nekonzistentnost korelacija i značajnosti istih za testove agilnosti bez lopte ($p=0.3-0.7$), kada se posmatraju na subuzorcima pojedinih uzrasta. Takođe, rezultati ANOVE ukazuju na značajne razlike u rezultatima svakog pojedinačnog testa između pojedinih uzrasta ($p<0.05$), ali ne i indeksa veštine koji je stabilan nakon 10-te godine.

Zaključak

Dobijeni rezultati govore u prilog činjenici da primenjeni testovi agilnosti procenjuju različite kretne strukture, ali da prilikom izvođenja istih sa loptom, dominantan faktor predstavlja vođenje lopte. Takođe, stabilnost indeksa veštine može ukazati da isti može biti značajan prediktor u identifikaciji i razvoju talenata.

Ključne reči: testiranje, agilnost, fudbaleri, indeks veštine

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THE INFLUENCE OF DRIBBLING THE BALL ON RESULTS IN AGILITY TESTS

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Introduction

Football skills, which are partly reflected through the technique of dribbling the ball, are an inseparable part of the specific movement and one of the central components of the identification and development of young players (1, 2). The aim of this study is to determine the relationship between the results of various agility tests, with and without the ball, as well as evaluation of a hypothetical construct called skill index.

Method

The testing has included 158 players who attended FK Partizan summer camp, age range 9 to 15 years. Two agility test were applied: Zig-zag test and Slalom test. Both tests were performed with and without the ball. Based on the relative differences of the results in the tests with the ball in relation to the results without the ball, skill indexes of subjects were obtained for each test separately.

Results and discussion

Results of correlation analysis showed a moderate, but statistically significant correlation between the results of the agility tests with and without the ball ($r = 0.80$ and 0.71 , $p < 0.001$), and low, but also statistically significant correlation between skills indexes ($r = 0.51$, $p < 0.001$). Also, observed correlations showed inconsistency for the tests without the ball ($p = 0.3-0.7$) in subsamples of certain ages. Also, the ANOVA results indicate the significant differences in results between certain ages for each test ($p < 0.05$), but no in skill indexes, which are relatively constant after the age of 10.

Conclusion

The results indicate the fact that the applied agility tests assess different movement structures, but by performing them with the ball, the dominant factor is the dribbling the ball. Also, the constancy of skill indexes can be an important predictor in talent identification and development.

Key words: testing, agility, football players, skills index

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EFFECTS OF DIFFERENT TEACHING METHODS IN HANDBALL

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Introduction

During the handball training, there are several types of learning, depending on the level of training and the degree of complexity of the structures that will be learned. The perceptive-motor method represents one's behavior transformation depending on the concrete training conditions.

Method

The motor method aimed to form habits based on sensitive kinaesthetic and proprioceptive components. During this process, the end of a movement represents the starting point of another one. The motor-intelligent method is typical for the heuristic sport fields. Except the three learning methods previously presented, we can also add the conscious learning, especially concerning high-level sportsmen. In order to determine the way that certain technical procedures in handball have been learned, we realized a technical layout. This layout is only executed once and it evaluates the technical execution in degrees from 1 to 10.

Results and discussion

After the two teams have traced the layout, we concluded that the average raise realized by the experimental team was up to 2.12 points, while the raise of the control team was only 1.12 points. The players from the experimental group got the following results: initial testing average was 6.75 points, final testing average was 8.87 points. At the initial testing, the control got the arithmetic average value of 7 points and 8.12 points in the final test. The average progress made by the experimental group was 2.12 points, and the control ones was lower than the experimental ones, being only 1.12 points. The standard deviation of the experimental group was 0.559 for the initial testing and 0.484 for the final one. Control group showed the following values: initial testing 0.612, final testing 0.549. The coefficient of variation of the experimental group at the initial testing was 8.28%, and 5.45% at the final testing, both values falling within the range 0-10% and reflecting a very good homogeneity. Same great homogeneity can be observed in the control group, as confirmed by the coefficient of variation at the initial testing, which at the beginning was 8.74% and 7.37% in the final.

Conclusion

The technical layout conceived in order to evaluate the level of learning for certain aspects in handball helped us to confirm the research hypothesis, through the results obtained by the experimental team. By applying a specific strategy in order to develop psychomotor skills and driving intelligence, one can increase the efficiency of certain specific technical aspects and tactics in attack or defence.

Key words: learning, training, handball

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МЕТОД СОФТВЕРСКОГ ПРАЋЕЊА И АНАЛИЗЕ КРЕТАЊА ИГРАЧА ТОКОМ ФУДБАЛСКЕ УТАКМИЦЕ

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Увод

Софтверско праћење и анализа података о кретању играча током фудбалског меча постају незаобилазни фактор успеха у аналитици и дијагностици, као и креирању тренажних садржаја у модерном фудбалу. Циљ овог истраживања био је да се утврди обим, интензитет и структура кретања играча током утакмице.

Метод

За снимање утакмица системом BioIRC Tracking Motion, коришћене су две идентичне видео камере Sony NEX-VG10, у full-HD резолуцији, и једна контролна камера са high speed перформансама. Камере се монтирају на засебним стативима и постављају на малом међусобном растојању (неколико метара), на највишим тачкама фудбалског стадиона (што ближе ортогоналној пројекцији). Свака камера је статична и служи за снимање по једне половине терена. Ради анализе видео фајлова, видео снимци су компримовани XVID кодеком у MOV формат, са фреквенцијом појачавања од 30 слика у секунди. Алгоритамски део софтвера за обраду видео снимака, тј. за праћење кретања играча, заснива се на утврђивању мере сличности статистичке дистрибуције боје објеката. За потребе овог истраживања обрађени су подаци са утакмица квалификација за ЛЕ Црвена Звезда-Бордо и полуфиналне утакмице купа Србије 2011/12. Црвена Звезда – Партизан.

Резултати са дискусијом

Резултати праћења и анализе сопственим софтвером, као и анализе добијених података су поређени са резултатима добијеним анализом Pro Zone i Amisco, комерцијалним софтверским системима за анализу кретања играча током фудбалске утакмице.

Закључак

Софтверско праћење кретања играча гравитира ка позицији незаобилазног аналитичко-дијагностичког средства у детекцији функционалног ефикасности играча током утакмице. Такође представља значајан систем информација за тренере и експерте из области спортске науке у стварању и усмеравању тренажних садржаја и стимулуса са крајњим циљем достизања модалних вредности у структури кретања играча на утакмици.

Кључне речи: софтверско праћење, видео фајлови, фудбал, анализа података

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METHOD FOR SOFTWARE TRACKING AND ANALYSIS OF PLAYERS' MOTION DURING A FOOTBALL MATCH

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Introduction

Software tracking and analysis of the data on the motion of players during a football match are becoming essential factors in the success of analytics and diagnostics, as well as in the creation of training content in modern football. The aim of this study was to determine the scope, intensity and structure of players' motion during a match.

Method

To record the matches with the system BioIRC Tracking Motion, two identical Sony NEX-VG10 video cameras in full-HD resolution have been used, as well as one control camera with high speed performances. The cameras are mounted on separate goalposts and placed on a small mutual distance (few meters), at the highest points of a football stadium (as close as possible to orthogonal projection). Every camera is static and each of them serves to record one half of the field. In order to analyse video files, video recordings are compressed by XVID codec into MOV format with the amplification frequency of 30 frames per second. Algorithmic part of the software for video editing, i.e. for players' motion tracking, is based on determining the level of similarity of the objects' color statistical distribution. For the purposes of this study, the data from qualification matches for Europa League Red Star –Bordeaux and Serbian cup 2011/2012 semi-final match Red Star – Partizan have been processed.

Results and discussion

The results of our own software tracking and analysis, as well as the analysis of the data obtained have been compared with those obtained by the analysis of Pro Zone and Amisco, commercial software systems for analysis of players' motion during a football match.

Conclusion

Software tracking of players' motion is close to the position of the decisive analytical-diagnostic tool in the detection of a functional efficiency of the players during a match.

It also represents a significant information system for trainers and experts from the field of sports science in the creation and direction of training contents and stimuli with the ultimate goal of reaching the modal values in the structure of the players' motion during a match.

Key words: tracking software, video files, football, performance analysis

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EFIKASNOST SPECIFIČNOG IDEO-MOTORNOG VEŽBANJA NA KOORDINACIJU I DINAMIČKU FLEKSIBILNOSTI

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Uvod

Predmet istraživanja u ovom radu su specifične vežbe starog japanskog sistema vežbanja "Junan Taiso" (JT) u kojima je proksimalna tačka nekog ekstremiteta voljno fiksirana u prostoru provocirajući njegovo kretanje u zamišljeno zatvorenom kinetičkom lancu (ZKL_z). Osnovni cilj rada je bio da se uporede promene uglova u zglobovima ruke, tokom izvođenja vežbi cirkumdukcije u zglobu korena šake (ZKŠ) u uslovima otvorenog (OKL) i zamišljeno zatvorenog kinetičkog lanca, kod tri različite grupe ispitanika. Osnovna pretpostavka od koje se polazi jeste da se specifična JT vežba koja je analizirana, u uslovima pravilnog tehničkog izvođenja, može koristiti u svrhu razvoja motoričkih sposobnosti dinamičke fleksibilnosti i specifične koordinacije.

Metod

Primenjen je kinematografski metod za deskriptivnu biomehaničku analizu specifične JT vežbe i objektivno prikupljanje goniometrijskih podataka. Uzorak su činile tri grupe ispitanika koje su definisane kao: majstorska (MG: n=10), početnička (PG: n=10) i srednjoškolska grupa (SG: n=12). Goniometrijski podaci maksimalno postignutih amplituda u zglobovima ruke tokom izvođenja ZKL_z i OKL vežbi izračunati su pomoću 2D SkillSpektor softvera za freimovanje snimaka koji su prikupljeni nakon 6 tretmana obuke pravilnog tehničkog izvođenja ZKL_z vežbe. Podaci unutar grupa su obrađeni osnovnom deskriptivnom statistikom zasnovanoj na koeficijentu varijacije, Studentovom t testu, korelacionoj analizi, i analizom varijansi (ANOVA).

Rezultati sa diskusijom

Rezultati poređenja maksimalnih zglobnih uglova su pokazali da izvođenje ZKL_z vežbe predstavlja veliki motorički izazov za vežbača, jer čak iiskusni sportisti utrenirani u specifičnim veštinama borenja (MG ispitanici) pokazuju statistički značajno manju homogenost u rezultatima cV% ($p < 0.05$). Studentovim t testom, kod MG ispitanika je utvrđeno da je analizirana ZKL_z vežba pogodnije trenajno sredstvo za razvoj dinamičke fleksibilnost od OKL vežbe sa greškom $p < 0.05$. Međutim, rezultati PG i SG ispitanika, pokazuju da nema značajne statističke razlike u postignutim maksimalnim ZKŠ uglovima između ove dve vežbe ($p > 0.05$), na osnovu čega je postavljena nova pretpostavka postojanja korelacije između određenih kordinacionih sposobnosti koje se razvijaju u borilačkim veštinama i specifičnih JT vežbi. Pozitivna linearna korelacija potvrđenja je kod MG i PG ispitanika, između ZKŠ uglova postignutih tokom izvođenja vežbe (na nivou značajnosti većem od $p < 0.05$), dok kod SG ispitanika dobijena korelacija nije statistički značajna na oba nivoa. Dobijeni rezultati korelacione analize između uglova u zglobovima lakta i ramena u sve tri grupe ispitanika, pokazuju da nema značajne korelacije ($p > 0.05$) između uglova koji se postižu u ZKL_z i OKL vežbi. Rezultati analize varijansi biće implementirani pri dostavljanju rada u celini.

Zaključak

Statističkom analizom dokazano je da ZKL_z vežba za ZKŠ zglob predstavlja veliki koordinacioni izazov za vežbače i u uslovima pravilnog tehničkog izvođenja je pogodnije sredstvo za razvoj dinamičke fleksibilnosti od OKL vežbe. Istraživanje treba nastaviti u smislu povećanja različitih grupa ispitanika, kako bi se otkrili efekti ZKL_z vežbi na određene koordinacione sposobnosti različitih kategorija vežbača.

Ključne reči: junan taiso, koordinacija, fleksibilnost, zglobni ugao

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EFFECTIVENESS OF A SPECIFIC IDEO-MOTOR EXERCISE ON COORDINATION AND DYNAMIC FLEXIBILITY

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Introduction

Research subject of this article presents specific exercises from the old Japanese system of “Junan Taiso” (JT) in which the proximal point of extremity is wittingly fixed in space provoking its movement in virtually closed kinetic chain (CKC_v). The main goal of this study was to compare the changes in arm joints angles during performance of the circumduction exercises in the wrist in an open (OKC) and virtually closed kinetic chain, with three different groups of subjects. The main assumption was that the specific JT exercise, that has been analyzed in terms of proper technical performance, can be used to develop motor skills of dynamic flexibility and specific coordination.

Method

Cinematographic method was applied on analysis of the CKC_v exercise and objective goniometric data collection. The sample consisted of three groups of subjects defined as: Masters (MG: n = 10), Beginners (BG: n = 10) and High school group (HSG n = 12). Goniometric data of maximum achieved arm joints amplitude during performing of OKC and CKC_v exercises were calculated using the 2D SkillSpektor software. Data within groups were analyzed through basic descriptive statistics based on the Student's T test and Correlation analysis, while data correlation and differences between groups were determined by ANOVA.

Results and discussion

Comparison of the results of the maximum joint angles showed that performing CKC_v exercise was a major coordination challenge for the exercisers, because even experienced athletes who were trained in the specific skills of fighting (MG subjects) showed significantly less homogeneity in the results of cV% ($p < 0.05$). Student's T test found that CKC_v exercise in the MG subjects was more appropriate instrument for the development of dynamic flexibility instead OKC exercise ($p < 0.05$). However, the results of PG and SG subjects, show that there is no significant statistical difference in the maximum angles achieved in the wrist between this two exercises ($p > 0.05$), on which is based a new assumption of existence of correlation between certain coordination abilities which develop in martial arts and specific JT exercises. A statistically significant positive correlation was confirmed with the MG and BG subjects between wrist angles, achieved during performance of the exercise (the level of significance was $p < 0.05$), while with the SG subjects obtained correlation is not statistically significant at both levels. The results of correlation analysis between the angles at the elbow and shoulder joints in all three groups, showed no significant correlation ($p > 0.05$) between the achieved angles in CKC_v and OKC exercises. Results of MANOVA will be implemented in the delivery of a whole article.

Conclusion

Statistical analysis proved that the CKC_v wrist exercise is major coordination challenge for the practitioners and in terms of proper technical performance is more appropriate instrument for the development of dynamic flexibility instead of OKC wrist exercise. Results proved that the CKV_{v exercise} can't be used as effectively as OKL standard dynamic exercise for developing dynamic flexibility of different categories of exercisers.

Key words: Junan Taiso, coordination, flexibility, joint angle

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SEKCIJA 4

**EFEKTI PRIMENE FIZIČKIH AKTIVNOSTI NA ANTROPOLOŠKI STATUS
POPULACIJE U SPECIJALIZOVANIM USTANOVAMA
(OSOBE SA POSEBNIM POTREBAMA, POLICIJA, VOJSKA)**

SESSION 4

**THE EFFECTS OF APPLICATION OF PHYSICAL ACTIVITY TO
ANTHROPOLOGICAL STATUS IN SPECIALIZED INSTITUTION
(PEARSONS WITH SPECIAL NEEDS, POLICE FORCES, ARMY)**

UTICAJ PRILAGOĐENOG PROGRAMA FIZIČKE AKTIVNOSTI PLIVANJA NA OSOBE OMETENE U RAZVOJU

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Uvod

Prilagođena fizička aktivnost je aktivnost koja je modifikovana za osobe ometene u razvoju. Jedna od prilagođenih aktivnosti je plivanje pod kojim se podrazumeva sposobnost održavanja tela na površini vode uz odgovarajuće pokrete ruku, nogu i tela. Karakteristična pojava pri plivanju je prividno gubljenje težine zbog delovanja sile potiska, što znači da osobe koje nisu u stanju da hodaju na zemlji mogu biti u mogućnosti da izvedu korake u vodi. Utvrditi prednosti, nedostatke i dati preporuke za plivanje osoba sa cerebralnom paralizom, paraplegijom, kvadriplegijom, mišićnom distrofijom, amputacijom i autizmom cilj je ovog rada.

Metod

Rad je koncipiran kao pregledni članak i zasniva se na analizi dostupne References, kako domaće tako i inostrane, prvenstveno se bazirajući na naučne istraživačke radove objavljene u časopisima u relevantnim bazama kao što su: Index Copernicus, SPORTDiscus, EBSCO, KOBSON.

Rezultati sa diskusijom

Pregledom literature dolazimo do zaključka da su prednosti prilagođenih sportova na vodi: poboljšanje disajnih funkcija, poboljšanje rada srca i stabilizacija krvnog pritiska kao i bolja ravnoteža i sposobnost hoda na zemlji. Osobama ometenim u razvoju je potrebna sredina koja ih podržava, koja podstiče njihov razvoj, samopouzdanje i uspeh.

Zaključak

U cilju njihovog uključivanja od društva se očekuje podizanje nivoa svesti da su osobe ometene u razvoju osobe koje mogu učestvovati u prilagođenim fizičkim aktivnostima. U Srbiji se aktivnosti ovog tipa ne sprovode ili se sprovode u maloj meri, iako postoje materijalni uslovi za njihovu primenu. Zbog toga je potrebna edukacija kadra za primenu prilagođenog programa plivanja. U prilogu su date preporuke za plivanje osoba ometenih u razvoju prema kategoriji ometenosti.

Ključne reči: osobe ometene u razvoju, prilagođene fizičke aktivnosti, prilagođeni sportovi na vodi, plivanje

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3. Vail, S. (2007). Community development and sports participation. *J Sport Management.*, 21, 571-596.

INFLUENCE OF ADAPTED PHYSICAL ACTIVITY PROGRAM OF SWIMMING IN PERSONS WITH DISABILITIES

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Introduction

Physical activity is a custom activity that has been modified for people with disabilities. One of the custom activity is swimming which means the ability to maintain the body on the surface of the water with the proper moves arms, legs and body. The characteristic appearance when swimming is apparently losing weight because of the buoyant force acting, which means that people who are unable to walk on the earth may be able to perform the steps in the water. To identify strengths, weaknesses and make recommendations for swimming person with cerebral palsy, paraplegia, quadriplegia, muscular dystrophy, amputation and autism.

Method

The study was designed as a review article and is based on an analysis of the References, both domestic and foreign, primarily basing on scientific research papers published in journals in the relevant databases, such as: Index Copernicus, SPORTDiscuss, EBSCO, KOBSON.

Results and discussion

Upon a review of the References we came to the conclusion that the benefits of custom water sports: improve respiratory function, improve heart and stabilization of blood pressure and better balance and ability to walk on land. Persons with developmental disabilities need an environment that supports them, which encourages their development, confidence and success.

Conclusion

In order to include them, society is expected to raise awareness that people with disabilities are persons who may participate in adapted physical activities. In Serbia, the activities of this type are not implemented or are being implemented on a small scale, although there are material conditions for their application. Therefore, the need for education of staff to implement custom swimming program. The following are recommendations for the swimming of persons with disabilities by disability category.

Key words: people with disabilities, adapted physical activity, adapted water sports, swimming.

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UTICAJ ŠESTOMESEČNOG PROGRAMA MALOG FUDBALA NA MOTORIČKE SPOSOBNOSTI INTELEKTUALNO OMETENIH OSOBA¹

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Uvod

Rad sa mentalno nedovoljno razvijenim osobama potvrđuje činjenicu da u njihovom životu ima više barijera koje ometaju njihov razvoj nego što je to slučaj u životu većine ljudi (2). Tako za ova lica, između ostalog, postoji vrlo mali broj organizovanih sportskih aktivnosti, a jedna od najbolje organizovanih sportskih aktivnosti u Beogradu svakako je Škola malog fudbala „Zemun“.

Metod

Rad je longitudinalno istraživanje u kojem je korištena eksperimentalna metoda, a eksperimentalni faktor predstavljala je realizacija šestomesečnog programa škole malog fudbala, u obimu od jednog treninga sedmično. Uzorak istraživanja činilo je 26 osoba sa mentalnom nedovoljnom razvijenošću uzrasta od 7 do 44 godina, a za potrebe istraživanja uzorak ispitanika podeljen je na dva subuzorka: 14 mladih ispitanika, uzrasta 7 do 12 godina i 12 starijih ispitanika uzrasta 25 do 40 godina. Za potrebe istraživanja praćene su dve varijable, skok u vis iz mesta sa zamahom ruku i skok bez zamaha ruku, a visina skoka merena je *optodžamp* metodom. Osim osnovnih pokazatelja deskriptivne statistike, za utvrđivanje značajnosti razlika između dobijenih rezultata korišten je t-test za male zavisne uzorke.

Rezultati sa diskusijom

Posmatranjem rezultata testa koji su ostvareni bez zamaha ruku i sa zamahom ruku, uočava se da na prvom testiranju, sprovedenom novembra 2011. godine, nije bilo statistički značajnih razlika ($p=0.2014$). Međutim, na testiranju koje je sprovedeno nakon 6 meseci realizacije programa, razlike između rezultata ostvarenih na ova dva testa bile su statistički značajne ($p=0.0002$).

Zaključak

Program malog fudbala, koji je realizovan sa mentalno nedovoljno razvijenim osobama, doprineo je poboljšanju rezultata testa na drugom testiranju. Ovi rezultati ukazuju na tendenciju poboljšanja eksplozivne snage, mada razlike u rezultatima nisu prešle granicu statističke značajnosti. Razlike između rezultata u skoku bez zamaha i skoku sa zamahom ruku, na prvom testiranju nisu bile statistički značajne, dok su na drugom testiranju razlike statistički značajne, što ukazuje na značajno poboljšanu koordinaciju ispitanika.

Ključne reči: intelektualna ometenost, motorika, koordinacija, eksplozivnost

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¹ Rad je deo Projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije Republike Srbije“ pod brojem III47015, a kao deo potprojekta “Efekti primenjene fizičke aktivnosti na lokomotorni metabolički psiho-socijalni i vaspitni status osoba sa posebnim potrebama R. Srbije” koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

INFLUENCE OF INDOOR SOCCER ON SOME MOTOR ABILITIES OF THE MENTALLY IMPAIRED PERSONS

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Introduction

Work with mentally impaired persons approves the fact that there are more obstacles in their lives which obstruct their development than in other people's lives (2). Therefore, among other things, there are small number of organized sports activities for these people, but for certain, one the best organized sports activities in Belgrade is School for Indoor Soccer "Zemun".

Method

In longitudinal research we used experimental method and experimental factor presented implementation of 6-month indoor soccer school program which requested a training per week. The study pattern included 26 mentally disabled persons from 7 to 44 years and for the research purpose the pattern was divided into two sub patterns: 14 examinees ages from 7 to 12 and 12 examinees ages from 25 to 40. Two variables were monitored for the research needs: standing high jump with arms swinging and standing high jump without arms swinging. The jump height was measured by Optojump method. Apart from basic indicators of descriptive statistics t-test for small relative patterns was used to determine significant differences between acquired results.

Results and discussion

By monitoring the test results performed either with or without arm swinging on the first test dated on November 2011, there were no significant differences ($p=0.2014$). However the test performed six months later, which included indoor soccer program, showed significantly different results: ($p=0.0002$).

Conclusion

Indoor soccer program which was performed with mentally disabled persons contributed the results improvement of both tests on the second testing. These results indicate some improvement of explosive power, though differences in results didn't cross the border of statistics importance. Still on the second testing differences between results with and without arm swinging were statistically significant as an outcome of significant improvement of coordination ability.

Key words: intellectual impairment, motor abilities, coordination skill, explosive strength

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DEFICITI U SOCIJALNOM PONAŠANJU DECE OMETENE U RAZVOJU NA ČASU FIZIČKOG VASPITANJA¹

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Uvod

Socijalno ponašanje predstavlja zapravo socijalno prihvatljivo ponašanje koje je neophodno pojedincu u interakciji sa drugim ljudima i ostvarivanju pozitivnih socijalnih odnosa sa vršnjacima. Teškoće na ovim poljima dovode do deficita, odnosno nepoželjnih oblika ponašanja. Deficiti u socijalnom ponašanju obično se primećuju sa polaskom u školu i stupanjem u kolektiv. Cilj ovog istraživanja je uočavanje deficita u socijalnom ponašanju na času fizičkog vaspitanja, kako kod dece sa smetnjama u razvoju tako i kod dece tipične populacije.

Metod

Istraživanje je sprovedeno u Beogradu, maja 2012. godine, u sledećim školama: OŠ Braća Baruh, OŠ Dragan Hercog i OŠ Boško Buha. Obuhvaćeno je 126 učenika oba pola. Uzorak čine tri grupe, i to: 79 ispitanika tipične populacije iz redovne osnovne škole Braća Baruh, 9 ispitanika sa cerebralnom paralizom iz osnovne specijalne škole Dragan Hercog i 38 ispitanika sa lakom mentalnom ometenošću iz osnovne specijalne škole Boško Buha. Osnovna metoda koja je korišćena u istraživanju je test observacije socijalnih veština. Procena je vršena tako što ispitivač observira i prati dete u određenim socijalnim uslovima, kao što je čas fizičkog vaspitanja i ocenjuje svaku od navedenih vrsta ponašanja.

Rezultati sa diskusijom

Rezultati istraživanja pokazuju da deca ometena u razvoju imaju deficite u socijalnom ponašanju ali i da deca redovne populacije imaju deficite (10.3% su neprimetni u društvu, 8.8% dece ne učestvuje u timskim igrama i ne želi da nauči pravila, 9.6% dece ne može da usmeri pažnju na instrukcije koje nastavnik daje.), s'tim sto su deficiti manji i izraženi u različitim oblastima u odnosu na decu ometenu u razvoju (deficiti učenika redovne populacije su najizraženiji u oblasti: otpozdravljanje drugih i konverzacija sa drugima, a deficiti učenika ometenih u razvoju u oblasti: nuđenje pomoći drugima, organizovanost, izražavanje ljutnje...).

Zaključak

Na osnovu rezultata istraživanja možemo zaključiti da su deficiti zasupljeni kod obe kategorije dece, kao i da se ispoljavaju u različitim socijalnim veštinama. Međutim, mora se ipak naglasiti da se deficiti u socijalnom ponašanju češće pojavljuju kod učenika koji pohađaju specijalne škole u odnosu na učenike redovnih škola. Neophodno je raditi na ovom problemu u koliko se želi da deca obe kategorije imaju bolje postignuće na svim nivoima edukacije.

Ključne reči: deca sa smetnjama u razvoju, socijalizacija, deficiti socijalnog ponašanja, fizičko vaspitanje

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¹ Rad je deo Projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije Republike Srbije” pod brojem III47015, a kao deo potprojekta “Efekti primenjene fizičke aktivnosti na lokomotorni metabolički psiho-socijalni i vaspitni status osoba sa posebnim potrebama R. Srbije” koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

DEFICITS IN SOCIAL BEHAVIOR OF CHILDREN WITH DISABILITIES IN PHYSICAL EDUCATION LESSON

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Introduction

Social behavior is actually socially acceptable behavior that is necessary to the individual in interaction with other people and developing positive social relationships with peers. Difficulties in these areas lead to a deficit or problem behavior. Deficits in social behavior usually noticed with starting school and entering into collective. The goal of this research is to detect deficits in social behavior in physical education lesson, as children with disabilities and children with typical population.

Method

The survey was conducted in Belgrade, May 2012. in the following schools: Elementary School Braca Baruh, ES Dragan Hercog and ES Bosko Buha. It included 126 students of both sexes. The sample consisted of three groups, as follows: 79 respondents typically population from mainstream primary schools Baruch Brothers, 9 patients with cerebral palsy in special elementary schools Dragan Hercog and 38 subjects with mild mental disabilities from elementary special school Bosko Buha. The basic method used in the study is a test of social skills of observation. The assessment was performed by the examiner and monitors child observation in certain social conditions, such as a physical education class and evaluate each of these types of behavior.

Results and discussion

Results of the study showed that children with disabilities have deficits in social behavior but also that children have deficits in the regular population (10.3% in the company are seamless, 8.8% of children do not take part in team games and does not want to learn the rules, 9.6% of the children can direct attention to the instructions given by the teacher ..), provided, however, that deficits are smaller and seen in different areas in relation to children with disabilities (regular student population deficits are most pronounced in the area: to back greet other and conversations with others, deficits of students with disabilities in the area: offering assistance to others, organization, expression of anger ...).

Conclusion

Based on the research results it can be concluded that the deficits are manifested in both categories of children as well as that they are manifested in different social skills. However, it must be stressed that the deficits in social behaviour occur more frequently with the students attending special schools than with the students of regular schools. It is necessary to deal with this issue in order to have better achievements at all educational levels and in other fields in both categories of children.

Key words: children with disabilities, socialization, social behavior deficits, physical education

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ACCESSIBILITY OF SLOVENE SCHOOL SPORTS HALLS FOR PHYSICALLY IMPAIRED STUDENTS

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Introduction

An important issue of children physical activity is accessibility of suitable buildings and spaces. Accessibility should be universal. The school sports hall is learning environment for physical education which represents prevalent physical activity of children nowadays. It is important to know what possibilities the sports halls offer in connection with the abilities of children and knowledge of teachers.

Method

Within umbrella research project "The analyses of school sports area with guidelines for further investments" (1) survey of accessibility of Slovene school sports halls for students with physical disabilities have been analysed. 107 primary and secondary schools were involved in survey. The questionnaire consisted of 7 aspects of accessibility of school sports halls. The answers with description of accessibility for each aspect were on scale from 1 (bad accessibility) to 3 (suitable accessibility). Data were gathered by trained personnel.

Results and discussion

It was found that more than 50% of Slovene schools have bad access for students with physical disabilities to enter school, to access in a school sports hall and to access to toilet. Especially bad accessibility is to outside playgrounds. The largest architectural barriers are the stairs in the way to the sports hall or the outside playground, too narrow or rotating door and narrow corridors to the sports hall.

Conclusion

The results demands suitable modernizations and renovations of school sports halls to ensure every child same opportunity for proper physical education.

Key words: architectural barriers, students with physical disabilities, physical education, playgrounds

References

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PLESOVI U NASTAVI OSOBA SA SENZORNIM OŠTEĆENJIMA SLUHA

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Uvod

Deca sa invaliditetom se u inkluzivnom obrazovanju susreću ne samo sa fiziološkim, psihološkim problemima razvoja, već i sa problemima socijalne integracije. Plesovi, kao lako i svima dostupna aktivnost, mogu biti od značaja u rešavanju ovih problema i vaspitno-obrazovnih zadataka.

Metod

Za utvrđivanje primene plesnih sadržaja u nastavi osoba sa senzornim oštećenjima sluha, izvršena je analiza plana i programa nastave fizičkog vaspitanja, individualnih obrazovnih planova i intervju sa profesorima o inkluzivnoj nastavi. U radu su dati primeri kompleksa vežbi oblikovanja, kao i preporuke za obuku društvenog plesa ča-ča-ča.

Rezultati sa diskusijom

Plesovi su u nastavnom planu i programu su slabo zastupljeni, a u praksi su slabo korišteni. Razlozi za to su neosposobljenost profesora za individualan pristup, nekreativnost i loši fizički uslovi. Didaktičke preporuke za rad su opšte i ističu značaj strpljenja i kreativnosti u radu. Najveći problem u radu jeste što učenici ne čuju muziku, stoga je važno ukazivati na ritam. Koreografije u paru, omogućavaju učeniku da oseti ritam preko ruke/šake. Sredstva/metode obučavanja su vizuelni prikaz, imitacija, pasivni pokreti i rad u paru. Učenici su slabo su motivisani, pa je značaj primene plesova najveći upravo u povećanju motivacije. Važno je da pokreti usana profesora budu jasno vidljivi, ali i da se koriste pokreti kao nosioci radnje.

Zaključak

Uprkos pozitivnim uticajima, nizak je kvantitet, kvalitet plesnih sadržaja u nastavi, za šta postoje razlozi, ali ne i opravdanja. Razvoj audio i video opreme, uz kreativnost nastavnika omogućava da se sa svima primeni neki od plesnih sadržaja u nastavi fizičkog vaspitanja.

Ključne reči: deca sa invaliditetom, plesni sadržaji, fizičko vaspitanje, inkluzija, plesovi

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DANCES IN TEACHING PEOPLE WITH SENSORY HEARING IMPAIRMENT

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Introduction

Children with disabilities in inclusive education are faced not only with the physiological, psychological concerns of development, but also with the problems of social integration. Dance as easy and accessible activity, may be of importance in solving these problems, and educational and upbringing tasks.

Method

An analysis of the curriculum of physical education, individual education plans, and interviews with teachers about inclusive education, were performed to determine the application of dance contents in persons with hearing impairments. The paper presents examples of the complex formation exercises, as well as recommendations for the training of social dance the cha-cha-cha.

Results and discussion

Dances in the curriculum are poorly represented, and in practice are poorly used. The reasons for this are teacher's incompetence for individual approach, non-creativity and poor physical conditions. Didactic recommendations that are given, are general and emphasize the importance of patience and creativity in work. The biggest problem in education is the fact that students do not hear the music, so it's important to point out the rhythm. Choreography in pairs allows students to feel the rhythm through the arms/hands. Means/methods of education and training are visual representation, imitation, passive movements and work in pairs. Students are poorly motivated, and the greatest importance of applying dances is increasing motivation. It is important that teachers mouth movements are clearly visible, also, that movements be used as carriers actions.

Conclusion

Despite positive impacts, dance classes are low in quantity and quality of the content, for which there are reasons, but not excuses. The development of audio and video equipment, with the creativity of teachers allows that dance as content in physical education be applied to all students.

Key words: children with disabilities, dance activities, physical education, inclusion, dances

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SKLONOSTI KA RAZLIČITIM VRSTAMA AKTIVNOSTI ADOLESCENATA SA LAKOM MENTALNOM RETARDACIJOM¹

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Uvod

Učešće u raznovrsnim aktivnostima doprinosi uspešnom psihosocijalnom razvoju. Adolescenti sa invaliditetom susreću se sa ograničenim mogućnostima učestvovanja u aktivnostima u socijalnoj zajednici. Cilj rada je da istražimo sklonosti adolescenata sa lakom mentalnom retardacijom ka različitim aktivnostima, što može pomoći osmišljavanju programa za njihovo uključivanje u šire socijalno okruženje.

Metod

Uzorkom je obuhvaćeno 28 učenika (21 muškog i 7 ženskog pola) sa lakom mentalnom retardacijom uzrasta od 13 do 18 godina škole „Petar Leković” u Beogradu. Za procenu sklonosti ka različitim vrstama aktivnosti korišćen je instrument Dečje sklonosti ka aktivnostima (1) kojim se procenjuje sklonost ka sledećim tipovima aktivnosti: rekreativnim, fizičkim, socijalnim, zasnovanim na veštinama i za samousavršavanje. Pouzdanost instrumenta na našem uzorku izražena Kronbahovim alfa koeficijentom iznosi 0.96. Ispitanici su za svaku stavku birali 1 od ponuđenih odgovora na trostepenoj skali: 1 – ne bih želeo-la; 2 – možda bih želeo-la, 3 – jako bih želeo-la. U analizi podataka korišćene su mere deskriptivne statistike.

Rezultati sa diskusijom

Ispitanici u proseku pokazuju najveću sklonost u rekreativnoj oblasti ka igranju računarskih i video igara (AS = 2.90), u oblasti fizičkih aktivnosti ka bavljenju plaćenim poslom (AS = 2.63), među socijalnim aktivnostima ka izlaženju napolje sa drugovima (AS = 2.82), u oblasti aktivnosti zasnovanim na veštinama ka plesanju (AS = 2.70) i u oblasti aktivnosti za samousavršavanje ka kupovini (AS = 2.67). Rezultati ukazuju da adolescenti sa lakom mentalnom retardacijom iskazuju u proseku najviše sklonost ka aktivnostima koje omogućavaju druženje sa vršnjacima, zaradu i zabavu.

Zaključak

Programi namenjeni uključivanju mladih sa lakom mentalnom retardacijom u šire socijalno okruženje treba da obuhvate aktivnosti koje omogućavaju druženje, zabavu i zaradu. Aktivnosti namenjene razvoju njihovih veština i sposobnosti treba da budu sadržane u ovim aktivnostima za koje oni iskazuju najviše sklonosti.

Ključne reči: laka mentalna retardacija, adolescenti, sklonosti ka aktivnostima

Literatura

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¹ Rad je deo Projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije Republike Srbije” pod brojem III47015, a kao deo potprojekta “Efekti primenjene fizičke aktivnosti na lokomotorni metabolički psiho-socijalni i vaspitni status osoba sa posebnim potrebama R. Srbije” koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

PREFERENCES FOR ACTIVITIES AMONG ADOLESCENTS WITH MILD MENTAL RETARDATION

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Introduction

Participation in various activities contributes to successful psychosocial development. Adolescents with disability face obstacles to participation in activities in broader social community. The aim of this study is to explore preferences for activities among adolescents with mild mental retardation which might contribute to the development of programs of the inclusion of these persons in broader social community.

Method

The sample included 28 pupils (21 males and 7 females) with mild mental retardation, aged 13-18 years who attend school "Petar Leković", Belgrade. Preferences for activities were assessed using the Preferences for Activities of Children instrument (1) which assesses the following types of activities: recreational, physical, social, skill-based and self-improvement activities. The reliability of the instrument in our sample is Cronbach's $\alpha = 0.96$. For each item the respondents chose the answers on a three point scale: 1 – I would not like to do at all; 2 – I would sort of like to do; 3 – I would really like to do. Data were analysed using descriptive statistics measures.

Results and discussion

The respondents on average show the highest preferences toward playing computer or video games ($M = 2.90$) among recreational activities, for doing a paid job ($M = 2.63$) among physical activities, for hanging out ($M = 2.82$) among social activities, for dancing ($M = 2.70$) among skill-based activities and toward shopping ($M = 2.67$) among self-improvement activities. The results suggest that adolescents with mild mental retardation show the highest preferences towards activities which provide possibilities for spending time with friends, enjoyment, and earning money.

Conclusion

The programs which aim to inclusion of adolescents with mild mental retardation into the broader social environment should include activities which provide possibilities for spending time with friends, enjoyment and earning money. Activities aimed to promote skills and capabilities of these persons should be incorporated into the activities for which they express the highest preferences.

Key words: Adolescents, mild mental retardation, preferences for activities

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UČEŠĆE I ZADOVOLJSTVO U SVAKODNEVNIM AKTIVNOSTIMA OMLADINE SA LAKOM MENTALNOM RETARDACIJOM¹

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Uvod

Učestvovanje u fizičkim aktivnostima, pored značaja koje ima za fizičko zdravlje i funkcionisanje, doprinosi psihičkoj dobrobiti osoba: povećanju stepena samopoštovanja, socijalne podrške, opadanju depresivnosti itd. (2). Cilj ovog rada je da istraži učešće i zadovoljstvo u svakodnevnim aktivnostima omladine sa lakom mentalnom retardacijom. Literatura o ovoj temi naglašava značaj učešća i zadovoljstva u fizičkim aktivnostima kao vitalnog dela procesa razvoja kod dece i mladih.

Metod

Uzorak je činilo 50 ispitanika uzrasta od 15 do 20 godina, muškog (N=36) i ženskog pola (N= 20), učenika Srednje škole „Petar Leković“ u Beogradu. Kao instrument je korišćen CAPE, The Children`s Assessment of Participation and Enjoyment, široko primenjivan u istraživačkoj praksi u inostranstvu. Ovo je prva primena ovog instrumenta u našim uslovima. Instrument je zadavan individualno.

Rezultati sa diskusijom

Ovaj rad bavi se raznovrsnošću i uživanjem u aktivnostima. CAPE identifikuje pet kategorija i dva tipa aktivnosti - formalne i neformalne. Što se tiče učestalosti bavljenja nekom aktivnošću, najviše aritmetičke sredine (AS) u zavisnosti od kategorije i tipa su: hobi, zanati i igre (AS=3.13), socijalne aktivnosti (AS=3.23), mirna rekreacija (AS=2.65), organizovani sportovi (AS=2.21), veštine (AS=1.21), aktivna fizička rekreacija (AS= 2.51), zabava i edukacija (AS=3.27), poslovi i zaposlenja (AS=2.64). Što se tiče zadovoljstva u aktivnostima, najviše AS u odnosu na kategorije i tip aktivnosti su sledeće: hobi, zanati i igre (AS=2.45), socijalne aktivnosti (AS=2.31) mirna rekreacija (AS=2.04) organizovani sportovi (AS=2.79), veštine (AS=1.45) aktivna fizička rekreacija (AS=2.01) zabava i edukacija (AS=2.69) poslovi i zaposlenja (AS=2.06). Za svaki od ajtema utvrđene su frekvencije i procenti.

Zaključak

Učestalost učešća i zadovoljstva u svakodnevnim aktivnostima omladine sa lakom mentalnom retardacijom relativno je podudarna. Potrebno je utvrditi stepen dostupnosti fizičkih aktivnosti koje instrument ispituje, s obzirom na socijalnu izolaciju osoba sa ometenošću. Nalazi istraživanja imaju značajne praktične implikacije u kreiranju daljih intervencija u rehabilitaciji ove dece, s obzirom da identifikuju one svakodnevnne aktivnosti koje imaju potencijalno najviše mogućnosti da vrše pozitivan uticaj na psihofizičko zdravlje osoba sa ometenošću.

Ključne reči: učešće, zadovoljstvo, omladina sa lakom mentalnom retardacijom, CAPE

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¹ Rad je deo Projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije Republike Srbije“ pod brojem III47015, a kao deo potprojekta “Efekti primenjene fizičke aktivnosti na lokomotorni metabolički psiho-socijalni i vaspitni status osoba sa posebnim potrebama R. Srbije” koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

PARTICIPATION AND ENJOYMENT IN DAILY ACTIVITIES OF YOUTH WITH MILD MENTAL RETARDATION

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Introduction

Participation in physical activity, in addition to the importance for physical health and functioning, contribute to psychological well-being of people: increases self-esteem, social support, decrease depression, etc. (2). The aim of this study is to examine the involvement and pleasure in daily activities of youth with mild mental retardation. The References on this subject emphasizes the importance of participation and enjoyment in physical activities, as a vital part of the development of children and youth.

Method

The sample consisted of 50 participants aged 15 to 20 years old, male (N = 36) and female (N = 20), a students of "Petar Leković", high school in Belgrade. We used the Children's Assessment of Participation and Enjoyment (CAPE) as a measure widely applied in research practice abroad. This is the first application of this instrument in domestic conditions. The instrument was administered individually.

Results and discussion

This paper focuses on the diversity and participant's enjoyment in daily activities. CAPE identifies five categories and two types of activities - formal and informal. As for the frequency of practicing an activity, the highest mean value (M), depending on the category and type, are: hobbies, crafts and games (M = 3.13), social activities (M = 3.23), quiet recreation (M = 2.65), organized sports (M = 2.21), skills (M = 1.21), active physical recreation (M = 2.51), entertainment and education (M = 3.27), jobs and employment (M = 2.64). As for the enjoyment of activities, most M in relation to the categories and the type of activities are as follows: hobbies, crafts and games (M = 2.45), social activities (M = 2.31), quiet recreation (M = 2.04), organised sports (M = 2.79), skills (M = 1.45), active physical recreation (M = 2.01), entertainment and education (M = 2.69) and jobs and employment (M = 2.06). For each of these items, frequency and percentages were found.

Conclusion

The frequency of participation and enjoyment in daily activities of youth with mild mental retardation is relatively congruent. It is necessary to determine the degree of accessibility of physical activity that the instrument examines, taking into account the social isolation of persons with disabilities. Findings of investigation have important practical implications in the design of further interventions in the rehabilitation of these children, because they identify the daily activities that have potential for the most positive impact on mental and physical health of persons with disabilities.

Key words: participation, enjoyment, youth with mild mental retardation, CAPE

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UČESTVOVANJE MLADIH SA CEREBRALOM PARALIZOM U SLOBODNIM AKTIVNOSTIMA¹

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Uvod

Osobe sa ometenošću su u socijalnim aktivnostima u riziku od socijalne izolacije i ostvarenja nižeg nivoa životnog zadovoljstva zbog smanjenog učestvovanja (1). Ovaj rad bavi se procenom učešća i zadovoljstva fizičkim aktivnostima mladih sa cerebralnom paralizom koje se odvijaju u vannastavnim, svakodnevnim okolnostima.

Metod

Uzorak čini 29 ispitanika, uzrasta od 11 do 19 godina, muškog (N=13) i ženskog pola (N=15), učenika specijalnih škola u Beogradu. Kao instrument je korišćen CAPE, The Children's Assessment of Participation and Enjoyment koji se sastoji od 55 ajtema. Ajtemi predstavljaju 5 kategorija (rekreacija, fizičke aktivnosti, socijalne aktivnosti, veštine i lično napredovanje/edukacija) i dva tipa aktivnosti (formalne i neformalne). U ovom radu prezentovane su samoprocene koje ispitanici daju o učešću i zadovoljstvu određenim aktivnostima na petostepenim skalama.

Rezultati sa diskusijom

Statističkom analizom utvrđene su AS i SD za sve ajteme – za njihovu učestalost i zadovoljstvo. Prema pojedinim ajtemima, najviše AS učestalosti aktivnosti utvrđene su za ajtem 48 - zabava i edukacija (AS= 6.65), ajtem 53 -obaveze i zaposlenja (AS= 6.31) i ajtem 44 – zabava i učenje (AS=6.13), a najniže za ajtem 49 – socijalne aktivnosti (AS= 0.00), ajtem 51- poslovi i zaposlenja (AS=0.03) i ajtem 27 –veštine (AS= 0.10). Najviše AS zadovoljstva u aktivnostima utvrđene su za ajtem 48 - zabava i edukacija (AS=4.48), ajtem 44- zabava i edukacija (AS=4.21) i ajtem 32 – aktivna fizička rekreacija (AS=4.70), a najniže za ajtem 16 – organizovan sport (AS= 0.14) i ajtem 49 - obaveze i zaposlenja (AS=0.14). Podjednako nisko zadovoljstvo utvrđeno je na ajtemima 51- obaveze i zaposlenja i ajtem 27 – aktivnosti bazirane na veštinama (AS= 0.17). Može se uočiti da se mladi sa cerebralnom paralizom ne bave volonterskim aktivnostima (ajtem 49) i veoma retko imaju časove muzike (ajtem 27), pri čemu ne osećaju ni zadovoljstvo u tim aktivnostima. Najčešće gledaju televizor (ajtem 44) i slušaju muziku (ajtem 48) i pri tome osećaju visok stepen zadovoljstva. Analizirane su frekvencije i procenti sa svaki ajtem, ako se uzme u obzir učestalost i zadovoljstvo.

Zaključak

Rezultati ukazuju na aktivnosti koje su ispitanicima dostupnije i omiljenije kao i one koje su im nedostupne i nepoznate jer nemaju mogućnost da ih sprovedu u našoj sredini. Oni ukazuju na potrebu proširenja okvira rehabilitacije mladih sa cerebralnom paralizom.

Ključne reči: mladi sa cerebralnom paralizom, slobodne aktivnosti, učešće, zadovoljstvo

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¹ Rad je deo Projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije Republike Srbije” pod brojem III47015, a kao deo potprojekta “Efekti primenjene fizičke aktivnosti na lokomotorni metabolički psiho-socijalni i vaspitni status osoba sa posebnim potrebama R. Srbije” koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

PARTICIPATION IN LEISURE ACTIVITY OF YOUNG PEOPLE WITH CEREBRAL PALSY

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Introduction

People with disabilities are at risk for social isolation and lower life satisfaction due to lower participation (1). This paper deals with the assessment of participation and enjoyment in physical activities of young people with cerebral palsy that occur in extracurricular, everyday circumstances.

Method

The sample consisted of 29 participants, aged 11 to 19 years old, male (N = 13) and female (N = 15), pupils from schools in Belgrade. As an instrument, we used the Children's Assessment of Participation and Enjoyment - CAPE, which consists of 55 items. Items presented five categories (recreation, physical activities, social activities, skills and personal promotion/education) and two types of activities (formal and informal). In this paper, the self-assessment about involvement and satisfaction of certain activities is given by participants on five-level scale.

Results and discussion

Through statistical analysis, M and SD were determined for all items, regarding frequency and enjoyment level. According to particular items, the highest AS incidence of activity was determined for item 48 – Entertainment and Education (M = 6.65), item 53 – Jobs and Employment (M = 6.31) and item 44 – Entertainment and Education (M=6.13), and lowest for item 49 - Jobs and Employment (M = 0.00), item 51 - Jobs and Employment (M = 0.03) and item 27 -Skills (M = 0.10). The most of AS pleasure in activities were detected for item 48 – Entertainment and Education (M = 4.48), item 44 – Entertainment and Education (M = 4.21) and item 32 – Active Physical Recreation (M = 4.70), and lowest for item 16 – Organized Sports (M = 0.14), item 49 – Jobs and Employment (M = 0.14). Equally low enjoyment confirmed on items 51 – Jobs and Employment and 27 – other skill based activities (M = 0.17). We can see, that the young with CP do not do voluntarily work and rarely go to music classes (item 49 and 27), while not enjoying them. They mostly watch TV (item 44) and listen to music (item 48) while highly enjoying it. For each of these items, frequency and percentages were analyzed, taking into account the participation and enjoyment.

Conclusion

The results indicate the activities that are more accessible and popular for respondents, and those that are inaccessible and unknown to them, because they don't have ability to implement these activities in our community. These findings point to the need to expand the framework of rehabilitation of young people with cerebral palsy.

Key words: youth with cerebral palsy, leisure activities, participation, enjoyment

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KOMPARATIVNA ANALIZA MORFOLOŠKIH OSOBINA I NEKIH MOTORIČKIH SPOSOBNOSTI PROFESIONALNIH VOJNIKA 4. BRIGADE KOPNENE VOJSKE

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Uvod

Predmet ovog istraživanja je komparativna analiza morfoloških osobina i motoričkih sposobnosti profesionalnih vojnika 4. brigade kopnene vojske iz kasarne „1. pešadijskog puka knjaza Miloša Velikog“ u Vranju, koji se rekreativno bave sportom i vojnika koji samo pohađaju nastavu fizičkog vaspitanja. U istraživanju je uspostavljena hipoteza: H1 – postoje razlike kod morfoloških osobina i motoričkih sposobnosti između vojnika koji su, pored nastave fizičkog vaspitanja podvrgnuti i rekreativnom bavljenju sportom i vojnika koji samo pohađaju redovnu nastavu fizičkog vaspitanja.

Metod

Ovo je istraživanje transferalnog tipa, a rezultati svih testova su obrađeni postupcima deskriptivne i komparativne statistike (t-test). Za prikupljanje relevantnih podataka, korišćene su odgovarajuće tehnike i instrumenti za merenje. Uzorak ispitanika su činile dve grupe vojnika po 30, odnosno eksperimentalna i kontrolna grupa. Uzorak varijabli je podeljen u dve grupe: morfološke i motoričke.

Rezultati sa diskusijom

Dobijeni rezultati ukazuju na homogenost uzorka u smislu antropometrijskih osobina i jedne i druge grupe, kao i to da postoje razlike u svim motorički varijablama, ali je statistički značajna razlika dobijena samo kod varijable: zgibovi (ZGI) ($p=0.02$). Dobijeni rezultati ukazuju na to da je nastava fizičkog vaspitanja dobro koncipirana, te da dodatna rekreativna aktivnost kontrolne grupe nije bitno uticala na promene njihovih motoričkih sposobnosti.

Zaključak

Primenjena rekreativna aktivnost ne dovodi do bitnih promena morfoloških karakteristika i motoričkih sposobnosti vojnika, što je dobro jer neće uticati na uspešno obavljanje njihovih profesionalnih obaveza.

Ključne reči: vojska, morfološke osobine, motoričke sposobnosti, fizičko vaspitanje, dodatna fizička aktivnost

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COMPARATIVE ANALYSIS OF MORPHOLOGICAL CHARACTERISTICS AND SOME MOTOR SKILLS OF FOURTH ARMY BRIGADE PROFESSIONAL SOLDIERS

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Introduction

The subject of this research is a comparative analysis of morphological characteristics and motor skills of professional soldiers of the fourth Brigade from "1st infantry regiment of Prince Miloš the Great" army barracks in Vranje, who are involved in sports recreationally and soldiers who only attend physical education classes. The study established hypotheses: H1 - there are differences in morphological characteristics and motor skills of the soldiers who were also subjected to physical education and recreational sports and soldiers who only attend physical education classes.

Method

This is a transversal study type, and the results of all tests were analyzed using descriptive and comparative statistics (t-test). For data collection appropriate techniques and instruments for measurement were used. The sample of respondents consisted of two groups of 30 soldiers and experimental and control groups. Variable sample was divided into two groups: morphological and motor.

Results and discussion

These results indicated the homogeneity of the sample in terms of the anthropometric characteristics of both groups, as well as that there are differences in all motor variables, but the difference was statistically significant only for variables: chin-ups (ZGI) ($p = 0.02$). The results suggest that physical education classes are well designed, and that additional recreational activity of the control group did not significantly affect the changes of their motor skills.

Conclusion

Applied recreational activity does not lead to substantial changes in the morphological characteristics and motor skills of soldiers, which is good because it will not affect the successful performance of their professional duties.

Key words: military, morphology, motor skills, physical education, extra physical activity

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UTICAJ OSNOVNE OBUKE UPOTREBE SLUŽBENOG PIŠTOLJA NA EFIKASNOST GAĐANJA KOD STUDENATA KRIMINALISTIČKO-POLICIJSKE AKADEMIJE¹

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Uvod

Upotreba službenog oružja pripada prostoru obaveznih profesionalnih veština za koje pripadnici policije moraju biti adekvatno obučeni. Cilj ovog rada je da definiše efikasnost osnovnog programa obuke u rukovanju službenim vaternim oružjem kod studenata Kriminalističko - policijske akademije (KPA) u odnosu na pol.

Metod

U istraživanju je učestvovalo 71 ispitanik (25 devojka i 46 muškaraca), koji su bili studenti KPA iz Beograda, bili predhodnog znanja iz gađanja i koji su pohađali osnovnu obuku u rukovanju službenim oružjem. Ispitanici su tokom obuke testirani 3 puta, i to inicijalno na početku (Test I), u sredini nakon tri programa gađanja tj. nakon 6 dana obuke (Test II), i na kraju obuke, nakon šest programa gađanja, odnosno dvanaesti dan obuke. Test se sastojao od preciznog gađanja u kružnu metu sa 10 metaka i distance od 10 metara. Test se realizovao u standardizovanim uslovima strelišta, bez vremenskog ograničenja gađanja. Rezultat testa je predstavljala vrednost zbira pogodjenih krugova mete, koji je izražen kao procenat efikasnosti gađanja. Rezultati su analizirani pomoću osnovne deskriptivne statistike, primanom ANOVE, dok je promena nivoa efikasnosti gađanja u funkciji trajanja obuke definisana matematičkim modelovanjem pomoću funkcije zavisnosti (2).

Rezultati sa diskusijom

Rezultati su pokazali da na generalnom nivou postoji statistički značajna razlika efikasnosti obuke pucanja kod ispitanika između polova i to na nivou Wilks' Lambde 0.849, $F=6.046$, $p=0.04$. Međutim, utvrđeno je da je jedini nosilac varijabiliteta razlika samo efikasnost gađanja utvrđena ne inicijalnom merenju - Test 1 ($F=19.845$, $p=0.000$), odnosno samo nivo početne veštine gađanja. Razlika efikasnosti gađanja između polova nije utvrđena kod Testova II i III. Definisane polinomske funkcije jednačine predikcije efikasnosti obuke su imale sledeći oblik: Studenti KPA, $y=-0.2194x^2+4.6424x+50.7391$; Studentkinje KPA, $y=-0.4712x^2+9.1412x+28.9167$, gde y predstavlja efikasnost pucanja, a x dane osnovne obuke upotrebe službenog pištolja.

Zaključak

Rezultati su pokazali da su se ispitanici razlikovali samo na inicijalnom merenju, dok je pod uticajem obuke njihova veština gađanja homogenizovana. Kod žena inicijalna efikasnost gađanja je bila 28.92 %, a finalna 70.76 %, dok je kod muškaraca bila 50.74 %, a finalna 74.86 %. Drugim rečima, isti program gađanja je kod žena povećao finalni nivo efikasnosti za čak 144.70 %, dok je kod muškaraca dato povećanje bilo 47.54 %.

Ključne reči: policija, obuka gađanja, službeni pištolj, studenti, KPA

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UTICAJ PRIPREMNE NASTAVE NA NIVO MOTORIČKIH SPOSOBNOSTI KANDIDATKINJA ZA UPIS NA KRIMINALISTIČKO-POLICIJSKU AKADEMIJU¹

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Uvod

Za policijski posao, i pored svih teškoća koje ga karakterišu, postoji veliko interesovanje građana. Potvrda je veliki broj kandidata oba pola za upis na Kriminalističko-policijsku akademiju (KPA). Ova činjenica daje mogućnost da se dobro osmišljenom i sprovedenom selekcijom izaberu najbolji pojedinci koji predstavljaju reprezent prijavljene populacije. Prijemni ispit osmišljen je kao četvorodimenzionalni model u okviru koga je predviđeno da na ishod rezultata ispita utiču i bazične motoričke sposobnosti (BMS). S obzirom da nivo razvijenosti BMS može biti posledica kontinuiranih i planskih fizičkih aktivnosti, KPA je uvela pripremnu nastavu iz ove oblasti. Cilj ovog rada bio je da prikaže uticaj pripremne nastave na BMS kandidata.

Metod

Uzorak ispitanika predstavljalo je 173 kandidata ženskog pola upisanih na osnovne akademske studije. Prvu grupu činilo je 87 devojaka iz generacije upisane školske 2010/11. godine, koja nije imala pripremnu nastavu. Drugu grupu činilo je 86 devojaka upisanih školske 2012/13. godine, sa kojima je organizovana pripremna nastava. Za utvrđivanje razlika između grupa posmatrani su rezultati testova za procenu repetitivne snage mišića opružača ruku (SKLEK), repetitivne snage mišića pregibača trupa (TRUP), brzinske snage mišića opružača nogu (DALJ), motoričke edukabilnosti (GRČ) i opšte aerobne izdržljivosti (KUPER).

Rezultati sa diskusijom

Rezultati MANOVA su pokazali da postoji statistički značajna razlika na generalnom nivo između posmatranih grupa ($p=0.017$). Statističke značajne razlike su utvrđene kod testova DALJ ($p=0.033$), GRČ ($p=0.017$) i KUPER ($p=0.007$). U daljem istraživanju grupe su podeljene u odnosu na status studiranja, a utvrđena je statistički značajna razlika kod samofinansirajućih studentkinja na generalnom nivou ($p=0.021$), kao i kod testova DALJ ($p=0.031$), GRČ ($p=0.005$) i KUPER ($p=0.007$). Kod grupa koji su činile studentkinje upisane na budžet nije utvrđena statistički značajna razlika.

Zaključak

Rezultati istraživanja su pokazali da je pripremna nastava imala uticaj na postignuće kandidatkinja tokom prijemnog ispita na KPA. U odnosu na konačno postignuće, grupa sa pripremnom nastavom imala je statistički značajno bolje rezultate, posebno kod kandidatkinja upisanih u statusu samofinansirajućih. Može se zaključiti da postoji opravdanost uvođenja pripremne nastave ali da još postoji značajan prostor za njeno dalje razvijanje.

Ključne reči: fizičke sposobnosti, studentkinje, KPA

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¹ Rad je deo Projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije Republike Srbije” pod brojem III47015, a kao deo potprojekta “Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije policije R. Srbije” koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

EFFECT OF PREPARATORY COURSE ON FEMALE CANDIDATES LEVEL OF MOTOR SKILLS FOR ADMISSION TO ACADEMY OF CRIMINALISTIC AND POLICE STUDIES

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Introduction

Police work, despite all the difficulties that characterize, is of high interest of citizens. Confirmation is the large number of candidates of both sexes for admission to the Academy of Criminalistic and Police Studies (ACPS). This fact gives the possibility that well designed and implemented selection choose the best and representative individuals of the reported population. The entrance examination is designed as a four-dimensional model within which is stipulated that results of the basic motor skills (BMS) influence on the final outcome. As the level of development of BMS may be the result of continuous and planned physical activity, the ACPS has introduced a preparatory education in this field. The aim of this study was to show the effect of preparatory classes on candidates BMS.

Method

The sample subjects were the 173 female candidates enrolled in undergraduate studies. The first group consisted of 87 girls from generation entered in 2010/11 school year, which had no preparatory classes. The second group consisted of 86 girls entered in 2012/13 school year, for which were organized preparatory classes. To determine the differences between groups, the results for assessment of repetitive strength of hand extensor muscle (PUSHUPS), repetitive strength of trunk muscle (TRUNK), velocity strength of knee extensor muscle (LJ), motor educability (ME) and general aerobic endurance (COOPER) were observed.

Results and discussion

MANOVA results showed a statistically significant difference in the general level between the groups ($p=0.017$). Statistically significant differences were detected in tests LJ ($p=0.033$), ME ($p=0.017$) and COOPER ($p=0.007$). In further research groups were divided over the status of study, and there was statistically significant difference in self-financed students at a general level ($p=0.021$), as well as the tests LJ ($p=0.031$), ME ($p=0.005$) and COOPER ($p=0.007$). In group consisted of students who were enrolled on the budget, no statistically significant difference was found.

Conclusion

The results showed that the preparatory classes had an impact on the achievement of the candidate in the entrance examination to the ACPS. In relation to the final achievement, the group with preparatory classes had significantly better results, especially for candidates enrolled in self-financed status. It can be concluded that there is justification for introducing preparatory classes, but there is still considerable scope for its further development.

Key words: physical ability, female students, ACPS

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STANJE I TENDENCIJE NASILJA NA SPORTSKIM PRIREDBAMA U REPUBLICI SRBIJI U PERIODU 2009–2011. GODINE¹

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Uvod

U dosadašnjoj praksi nije bilo istraživanja stanja i tendencija nasilja na sportskim priredbama u Republici Srbiji (RS) za period 2009–2011. godina. S tim u vezi, formulisana je i opšta hipoteza koja glasi: „Stanje bezbednosti na sportskom manifestacijama u RS u periodu 2009–2011. godina je stabilno, s povoljnim tendencijama po svim bitnim parametrima, izuzev po broju napada na policajce“.

Metod

Primenila se kompleks metoda primerena istraživanju društveno-humanističkih aspekata za istraživanja karakteristika nasilja na sportskim priredbama. Taj kompleks obuhvata metodu analize sadržaja, primenjenu u istorijskom kontekstu, u smislu analize dokumenata koji sadrže statističke podatke o nasilju na sportskim priredbama u RS u razmatranom periodu. U daljem toku istraživanja korišćena je komparativna statistička metoda, a nakon toga metoda modelovanja.

Rezultati sa diskusijom

Broj sportskih manifestacija u RS u stalnom je porastu. Uprkos tome, u razmatranom periodu zabeležen je trend smanjenja broja težih slučajeva narušavanja javnog reda i mira, stabilizacija broja lakše povređenih osoba, trend pada broja teže povređenih građana i policajaca i napada na sportske sudije, odnosno broja prekinutih sportskih priredbi, kao i smanjenja broja dovedenih i zadržanih lica od strane policije. Negativne tendencije prisutne su u pogledu rasta broja napada na policajce. Dalja istraživanja u ovoj oblasti treba da budu usmerena ka identifikaciji specifičnih formi primenjene fizičke aktivnosti policajaca povodom nasilja na sportskim priredbama.

Zaključak

Stanje bezbednosti na sportskim manifestacijama u RS je stabilno i prisutni su pozitivni trendovi po svim bitnim pokazateljima, izuzev u pogledu broja napada na policajce, koji se utrostručio od 2009. do 2011. godine.

Ključne reči: nasilje, navijači, sportske priredbe, policija

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¹ Rad je deo Projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije Republike Srbije” pod brojem III47015, a kao deo potprojekta “Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije policije R. Srbije” koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

STATUS AND TRENDS OF VIOLENCE AT SPORTING EVENTS IN THE REPUBLIC OF SERBIA IN THE PERIOD OF 2009-2011.

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Introduction

In current practice has not been any research situation and tendency of violence at sporting events in the Republic of Serbia for the period 2009–2011. In this regard, the general formulation of the hypothesis which states: “The situation of security in sporting events in the Republic of Serbia period in 2009–2011. was stable, with favorable trends in all important parameters, except for the number of attacks on police officers.”

Method

It will implement the complex of methods adequate to study the socio-humanistic aspects of violence at sporting events. The complex includes a content analysis method, applied in a historical context, in terms of analysis of documents containing statistical data on violence at sports events in the RS in the considered period. It will still cause the application of comparative and statistical methods and modeling method.

Results and Discussion

Number of sporting events in the RS is steadily increasing. However, in the considered period there are downward trend in the number of severe cases of violation of the public order and peace, stabilization of the number of persons injured more easily, decreasing the number of people injured and more difficult to police and attacks on the umpire or the number of broken sporting events, as well as reducing the number brought and detained persons by police. Negative trends are present in the increase in attacks on police officers. Further research in this area should be directed towards the identification of the specific form of applied physical activities of police officers regarding violence at sporting events.

Conclusion

Situation of security in sporting events in the RS is stable and positive, and trends are presented in all material parameters, except for the number of attacks on police officers, which has tripled since 2009 to 2011.

Key words: violence, fans, sporting events, police

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SEKCIJA 5

**INTERDISCIPLINARNI PRISTUP U ISTRAŽIVANJU EFEKATA PRIMENE
FIZIČKIH AKTIVNOSTI U FIZIČKOM VASPITANJU, SPORTU I REKREACIJI
(DRUŠTVENO-HUMANISTIČKE NAUKE)**

SESSION 5

**INTERDISCIPLINARY APPROACH IN RESEARCH OF THE EFFECTS OF
PHYSICAL ACTIVITY APPLICATION IN PE, SPORT AND RECREATION
(SOCIAL SCIENCES AND HUMANITIES)**

OPAŽANJE IZVORA LIČNE KOMPETENTNOSTI U NASTAVI FIZIČKOG VASPITANJA^{1, 2}

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Uvod

Doživljaj lične kompetentnosti u nastavi fizičkog vaspitanja predstavlja važnu komponentu motivacije za nastavu. Cilj ovog istraživanja bio je proveriti koliki značaj pojedinim izvorima lične kompetentnosti u nastavi fizičkog vaspitanja (lično iskustvo, vršnjaci, nastavnik) pridaju učenici različitog pola, uzrasta, uspeha u nastavi i različitog nivoa bavljenja fizičkim aktivnostima van škole.

Metod

Uzorak je činilo 340 učenika osnovne i srednje škole. Za ispitivanje opažanja izvora lične kompetentnosti u nastavi fizičkog vaspitanja korišćena je skala POC (Middle School Physical Education Perception of Competence Scale), koja je adaptirana za ispitivanja u našim uslovima. Skala sadrži 15 tvrdnji praćenih petostepenim skalama Likertovog tipa koje su grupisane u tri subskale: iskustvo, vršnjaci i nastavnik. Učenici su u upitniku dali podatke o polu, godinama, oceni iz fizičkog vaspitanja, bavljenju sportom i rekreativnim aktivnostima. Podaci su obrađeni deskriptivnom statistikom i statistikom zaključivanja (t-test, koeficijent korelacije i ANOVA).

Rezultati sa diskusijom

Rezultati su pokazali da POC ima zadovoljavajuće metrijske karakteristike (Kaiser-Mayer-Olkin = 0.80, Crombah α = 0.67). Učenici izvore lične kompetentnosti u najvećoj meri vide u vršnjacima (Mean = 3.00), zatim nastavniku (Mean = 2.93) i na kraju ličnom iskustvu (Mean = 2.78). T-testom je pokazano da učenice u opažanju izvora lične kompetentnosti veći značaj pridaju iskustvu i nastavniku, dok učenici veći značaj pridaju vršnjacima. Učenici sa nižim ocenama iz fizičkog vaspitanja veći značaj pridaju iskustvu u odnosu na učenice sa višim ocenama. Učenici koji treniraju veći značaj pridaju vršnjacima, a oni koji ne treniraju iskustvu. ANOVA je pokazala da učenici koji se ređe bave rekreativnim aktivnostima veći značaj pridaju iskustvu i nastavniku. Korelacija između uzrasta i opažanja izvora lične kompetentnosti nije statistički značajna.

Zaključak

Rezultati ukazuju da učenici pri opažanju izvora lične kompetentnosti u nastavi fizičkog vaspitanja veliki značaj pridaju socijalnim faktorima (vršnjaci i nastavnik). Imajući ovo u vidu, potrebno je stvoriti povoljnu nastavnu klimu koja bi povećala doživljaj lične kompetentnosti i motivaciju za nastavu.

Ključne reči: izvori lične kompetentnosti, fizičko vaspitanje, učenici

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PERCEPTION OF COMPETENCE SOURCES IN PHYSICAL EDUCATION

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Introduction

The perception of competence in PE classes is an important component of motivation for instruction. The aim of this study was to examine the level of importance attributed to certain sources of personal competence in PE classes (personal experience, peers, teacher) by the students of different gender, age, with different success in class and different level of extracurricular involvement in physical activities.

Method

The sample consisted of 340 students of elementary and high schools. The perception of competence sources in PE classes was measured by the POC scale (Middle School Physical Education Perception of Competence Scale), adapted for the research in our conditions. The scale consists of 15 statements followed by 5-step Likert-type scale, grouped in three subscales: experience, peers and teacher. The participants provided data in a questionnaire regarding to their gender, PE mark, involvement in sport and recreation. The data were analysed by descriptive statistics, t-test, correlation coefficient and ANOVA.

Results and Discussion

The results indicated that POC has satisfactory metrical characteristics (Kaiser-Meyer-Olkin=0.80, Cronbach α = 0.67). Peers appeared to be the major sources of students' personal competence (Mean = 3.00), followed by the teacher (Mean = 2.93) and finally by personal experience (Mean = 2.78). T-test showed that females grade experience and the teacher as greater source of competence, while the males attribute more importance to the peers. Students with lower PE marks graded higher experience compared to the students with higher marks. The students who train favour peers while those who do not train favour experience. ANOVA has shown that students who are more rarely involved in recreational activities attribute more importance to experience and teacher. The correlation between age and perception of the source of competence is not statistically significant.

Conclusion

The results indicate that in perception of the sources of competence in PE classes, the students attribute great importance to social factors (peers and teacher). Having this in mind, it is necessary to create favourable instruction environment which would increase the perception of personal competence and motivation for learning.

Key words: sources of competence, physical education, students

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INTERESOVANJA ZA FIZIČKE AKTIVNOSTI UČENIKA OSNOVNIH ŠKOLA U SREMSKOJ MITROVICI, JAGODINI I NIŠU

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Uvod

Interesovanja imaju veliki značaj u dinamičkoj strukturi ličnosti i često pokreću na različite vrste aktivnosti. Ovo istraživanje se bavilo problemom interesovanja učenika 7. razreda osnovnih škola u Sremskoj Mitrovici, Jagodini i Nišu, a naročito problemom interesovanja za fizičke aktivnosti (sportsko-rekreativno interesovanje).

Metod

Neeksperimentalno istraživanje anketnog tipa je izvršeno na uzorku od 1095 učenika oba pola. Instrument istraživanja je modifikovani upitnik Pantića i saradnika (1) koji su učenici popunjavali u toku jednog školskog časa. Podaci su obrađeni korišćenjem deskriptivnih statističkih procedura (Hi-kvadrat test, AS i SD).

Rezultati sa diskusijom

Rezultati su pokazali da su interesovanja učenika veoma neujednačena po raširenosti i intenzitetu i da je sportsko-rekreativno interesovanje među najdominantnijim i za učenike i za učenice (preko 70% odgovora u upitnicima, na nivou ukupnog uzorka). Visok intenzitet ovog interesovanja navodi na pretpostavku o aktivnostima učenika/ca u okviru ove oblasti, što je i osnovni razlog ispitivanja interesovanja učenika. Hi-kvadrat test nezavisnosti je pokazao značajnu vezu između pola ispitanika i sportsko-rekreativnog interesovanja $\chi^2_{(4, n=5475)} = 194.314, p = 0.00, f_i = 0.19$.

Zaključak

Značaj rezultata dobijenih ovim istraživanjem je, pre svega, praktične prirode. Interesovanja učenika mogu da budu značajan indikator njihovih potreba, želja, afiniteta. To može da predstavlja osnovu za planiranje sadržaja koji se nude mladima u školi i van nje. Neka interesovanja mogu da budu signal asocijalnih i kontrastivnih tendencija, što takođe predstavlja dobru osnovu za izgrađivanje adekvatne strategije uticaja.

Ključne reči: interesovanja, fizička aktivnost, učenici/učenice

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INTERESTS IN PHYSICAL ACTIVITY OF PRIMARY SCHOOL STUDENTS IN SREMSKA MITROVICA, JAGODINA AND NIŠ

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Introduction

Interests have a great significance in the dynamic structure of personality and often run on different types of activities. This study dealt with the problem of students' interests in 7th grade of primary school in Sremska Mitrovica, Jagodina and Nis, and in particular with the problem of interest in physical activities (sports and recreational interests).

Method

Non-experimental research survey type was conducted on a sample of 1095 students of both sexes. The survey instrument was modified questionnaire Pantić et al (1) that the students filled in during a lesson. Data were analyzed using descriptive statistical procedures (chi-square test, MEAN and SD).

Results and discussion

The results showed that students' interests are very unbalanced by the extent and intensity and the sport and recreation interest is the most dominant among the female and male students (more than 70% of the respondents on the level of the total sample). The high intensity of this interest leads to the assumption about students' activities in this area, which is the main reason for testing students' interest. Chi-square test of independence showed a significant relationship between gender of respondents and the sport of interest $\chi^2_{(4, n=5475)} = 194.314, p = 0.00, \Phi = 0.19$.

Conclusion

The significance of the results obtained in this study is primarily practical. Interests of the students can be an important indicator of their needs, desires, preferences. This may be the basis for planning the content offered to young people in and out of school. Some interests may be a signal of asocial tendencies, which also provides a good basis for developing a proper strategy of influence.

Key words: interests, physical activity, students

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PEDAGOŠKE IMPLIKACIJE REALIZACIJE SPORTSKO – TEHNIČKOG OBRAZOVANJA U SREDNJOJ ŠKOLI¹

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Uvod

Sportsko-tehničko obrazovanje je jedno od ključnih tematskih područja programa fizičkog vaspitanja. To je ujedno i primarni zadatak fizičkog vaspitanja. Postignuća učenika iz sportsko-tehničkog obrazovanja u velikoj meri određuju odnos učenika prema fizičkom vaspitanju. U praksi fizičkog vaspitanja ima indicija da se sportsko-tehničko obrazovanje nedosledno sprovodi. Uzroci su mnogobrojni: subjektivni (nastavnici ne realizuju program) i objektivni (ne postoje uslovi za realizaciju programskih sadržaja). Problem istraživanja je ispitivanje realizacije sportsko-tehničkog obrazovanja na iskustvu studenata Fakulteta sporta i fizičkog vaspitanja. Osnovne hipoteze istraživanja su: „program sportsko-tehničkog obrazovanja kako u nastavi tako i u vančasovnim aktivnostima se ne realizuje u potpunosti, za realizaciju programa u školama ne postoje potpuni uslovi, mnogi zadaci se ne realizuju iz nemarnog odnosa škole i nastavnika prema programu fizičkog vaspitanja“.

Metod

Anketom od 50 ajtema anketirano je 141 studenata prve godine Fakulteta sporta i fizičkog vaspitanja u Beogradu. Dobijen je uvid u realizaciju programskih sadržaja nastave i vančasovnih aktivnosti. Upitnik je strukturiran za potrebe istraživanja. Logička strategija pitanja i njihova upotrebna vrednost urađeni su na principima ispitivanja javnog mnjenja (4). Podaci su obrađeni deskriptivnom statistikom i χ^2 kvadrat testom.

Rezultati sa diskusijom

Utvrđeno je da se programski sadržaji nedosledno realizuju. U nastavi se neki zadaci realizuju u 50% i manje. Realizuje se oko 50% motoričkih zadataka gimnastike i atletike. Rezultati su slični sa prethodnim istraživanjima (2). Situaciji delimično doprinose i uslovi nastave. Realizacija vančasovnih aktivnosti je delimična. Najviše je zastupljeno tekmičenje u sportskim igrama. Manja pažnja posvećena je takmičenjima u individualnim sportovima i izletima. U odnosu na realizaciju zadataka u osnovnoj školi dobijeni su lošiji rezultati u odnosu na predhodnu studiju (1).

Zaključak

Sportsko-tehničko obrazovanje se ne sprovodi dosledno. U školama ne postoje potpuni uslovi za realizaciju programa. Neki zadaci se ne realizuju iako postoje uslovi. Rezultati u pokazali da 2/3 anketiranih studenata smatra da su oštećeni ne realizovanjem programa u potpunosti.

Ključne reči: fizičko vaspitanje, program, realizacija, srednja škola

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¹ Rad je deo Projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije R. Srbije“ pod brojem III47015, a kao deo potprojekta “Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status školske populacije R. Srbije” koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

PEDAGOGICAL IMPLICATIONS OF REALIYATION OF SPORTS- TECHNICAL EDUCATION IN SECONDARY SCHOOLS

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Introduction

Sports-technical education is a key thematic area of the physical education syllabus. That is also a primary task of physical education. The level of sports-technical education determines also the students' relationship towards physical education. The PE practice indicates that the tasks are inconsistently implemented. There are more reason for this: subjective (teachers do not realize the program); objective (there are no conditions for realization of all contents). The realization of sports-technical education was investigated based on the experience of the students of the Faculty of Sport and Physical Education. The hypotheses were: „the program of sports-technical education (classes, extracurricular activities) are not fully realized, there are no all the requirements for program realization in schools, the tasks are not realized due to neglectful relation of school and teachers regarding the program“.

Method

141 first-year students of the Faculty of Sport and Physical Education did a 50-item questionnaire. The overview of the realization of program contents of classes and extracurricular activities was obtained. The questionnaire was structured for the research requirements. The logical strategy of the question and their use value were done based on the principles of opinion poll (4). The results were elaborated with descriptive statistics and χ^2 test.

Results and discussion

It was established that: program contents are inconsistently realized. Certain tasks are realized in classes in less than 50%. Only around 50% of motor tasks of gymnastics and track and field are realized. The results are similar to previous research (2). It can be partly accounted for by instruction conditions. The realization of extracurricular activities is partial. The competition is the most represented in the sports games. Less attention is dedicated to competitions in individual sports and excursions. With regard task realization in elementary schools, the obtained results were worse (1).

Conclusion

Sports-technical education is not consistently implemented. Schools do not provided completed conditions for program realization. Some tasks are not realized despite the fulfilled conditions. 2/3 of the respondents consider themselves deprived due to the failure of program realization.

Key words: physical education, program, realization, secondary schools

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DIFFERENCES IN ENGAGEMENT IN PHYSICAL ACTIVITIES IN LEISURE TIME BETWEEN STUDENTS OF BELGRADE AND SKOPJE STATE UNIVERSITIES¹

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Introduction

Adults aged 18-64 years should do at least 150 minutes of moderate-intensity aerobic physical activity throughout the week, or do at least 75 minutes of vigorous-intensity aerobic physical activity through the week, or an equivalent combination of moderate – and vigorous intensity activity (1). Leisure time physical activity is subject to changing trends. Organized sport activities have long provided substantial and varied opportunities for activity for many groups (2). The goal of the study is to determine How often students at State Universities in Belgrade and Skopje, engage physical activity, sport in leisure time. We expect to detect statistically significant differences between students of both Universities.

Method

The Survey has been conducted on a sample of 1173 male respondents, of which 861 respondents from State University in Belgrade and 312 respondents of State University in Skopje. Closed type of anonymous questionnaire was distributed to the respondents. Differences between respondents were tested with descriptive (frequency distribution, percentage) and comparative statistics (X^2 -chi-square) test.

Results and discussion

Analysis of the results of the question: How often students at State Universities in Belgrade and Skopje, engage in some kind of physical activity or sport in leisure time? has shown that 4.76% students at Belgrade University are never practicing any kind of physical activity, while the same answer was provided by 4.16% of students at Skopje University. Sometimes are physically active in leisure time 24.4% of students at State University in Belgrade, compared to 34% at Skopje University who have provided the same answer. 35.9% of students practice physical activity 1-2 times per week at Belgrade University, compared with 35.6% at Skopje University; 3-4 times/week physical activity is the answer provided by 35% of Belgrade students, compared to 26.3% of students in Skopje. Statistically significant difference has been detected among 2 groups of students ($X^2=13.27$, $df=3$, $p=.00$). Results are corresponding with data obtained with European Opinion Research Group, 2003 that have shown that 2/3 of adult population in EU countries are insufficiently engaged in physical activity for achievement of optimal health benefit.

Conclusion

Higher trend of engagement in sports and recreational activities has been noted in Belgrade students, which could be attributed to acquired positive sports tradition, as well as achievements at individual and team levels in some sports recently. Although lower, Skopje students have also shown some interest in engagement in sport activities; in general, there is a need at both universities to create programs for more frequent engagement of students in some forms of physical activities in their leisure time.

Key words: physical activities, leisure time, students

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PHYSICAL ACTIVITY DURING STUDENTS' FREE TIME -MOTIVATIONS AND TEMPTATIONS

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Introduction

The deficient promotion strategy for an active lifestyle places Romania on the first position for juvenile obesity in Europe and the last evaluations regarding the motor and effort capacity of middle school and high school students reveal concerning results. Motivation and students' orientation towards spending their free time in an active manner embody a feasible alternative in order to change mentalities and behaviors of the young generation. The purpose of this study is to identify the negative temptations and especially the motivations of middle school and high school students for practicing outdoor sportive-recreational activities within the independent activity and to correlate them with the physical activity index.

Method

Two questionnaires have been used for the study carried out between 2nd -20th of April 2012 on a sample of 196 middle school students and 187 high school students from Brasov and Mures: the evaluation of the physical activity index (IAF) and another one to identify motivations and methods to spend the free time actively.

Results and discussion

Results show that middle school students have a superior index of physical activity than the high school students. The study reveals that 66.6% of the middle school students as compared with 62.5% of high school students practice sportive-recreational activities out of pleasure for movement and for health, whereas 37.5% of high school students in comparison with 29.1% of middle school students are motivated by group affiliations or self-perfection. An interesting result is represented by the fact that middle school students (25%) are more preoccupied with the physical aspect as opposed to high-school students (12.5%).

Conclusion

On middle school level, the students' motivations to practice physical activities in their spare time are especially extrinsic: educational, promoted by teachers and media related, through advertising clips and promotion programs for an active and healthy lifestyle. In the case of high school students another set of motivations was encountered, especially of intrinsic nature, focused on social integration, self-esteem, physical aspect, contentment created by the activity, success, appealing character of physical activities, etc. The negative causes are numerous and mainly artificially motivated and they are correlated with appealing negative temptations.

Key words: physical activities, motivations, temptations

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CORRELATION BETWEEN: TYPE OF RECREATIONAL WATER ACTIVITIES - THE STRESS - PROFESSIONAL QUALIFICATION

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Introduction

Aquatic driving recreational activities presented in their composition: the autotelic feature intrinsic finalities they produce, seeking personal satisfaction of all practitioners, autoplasic feature that motivates their practice in order to achieve harmony of body and adaptation to new situations, and a feature involving motor movements sanogenic determined by aerobic effort by requiring muscle power and influencing mental improvement of all functions of the body. This study aims to investigate the option of practicing adult women recreational aquatic activities (acquagym, aquafitness, aqua-pullpush-gym), their preference to choose programs depending on stress levels and qualifications

Method

The study sample consisted of 30 women, aged 30-50 years and graduate in three occupational categories: doctor, professor and economist. Investigative tools consisted of two questionnaires: one for assessing the level of stress and one to assess practice of aqua-physical activity. The study took place from June-September 2012, stress evaluation questionnaire was applied in June, preferably questionnaire in September.

Results and discussion

Stress assessment questionnaire indicated that out of 30 subjects, 4(13.3%) is within the “normal stress” and occupational category is doctors, 20 subjects (66.7%), fall in “moderate stress” is represented: 6 doctors, 4 professors, 4 economists and all sample and 6 economists women to” very stressful” (20%). Preference subjects: 17 aqua-pullpush-gym (56.7%), 8 teachers, 5 doctors and 5 economists, 8 Acquagym (26,6%), including 5 doctors, 3 teachers and 5 economists is preferred by aquafitness (16.7%).

Conclusion

All persons who had high stress index e preferred aqua-fitness, work more demanding and not very attractive and recreation and the majority favoured aqua-pullpush-gym. Acquagym was preferred by doctors and teachers who had a low to medium stress state due to attractiveness, diversity and level of effort but less demanding compared to the other activities covered by this study.

Key words: aquatic activities, stress, occupation

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SPORTSMAN'S PERSONALITY AND THE ACTIVITY OF SELECTION

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Introduction

Knowing the sportsmen's personality represents a major aspect both for teachers and coaches, in their activity of selecting sportsmen. In sport, knowing the sportsmen personality is a key factor for forecasting their results and planning their practice.

Method

The main research method used in this inquiry was a questionnaire. It was aimed to proving the following aspects:

- spiritual intelligence and top experience;
- the sportsman psychological condition;
- the situational emotional situation.

The experimental sample consisted of athletes aged 14 to 17 years, handball players at H.C. Rom-Cri Brașov, trained by Prof. Florin Paraschiv and Prof. Alina Teslărașu, and consisted of 16 field players and 4 goalkeepers practicing handball for 6-7 years. The initial selection was made at the age of 9-10 years, covering a period of two years of general early initiation and a specific initiation period of 2-3 years.

Results and discussion

The questionnaire aimed at analysing spiritual intelligence and peak experience of the subjects under investigation, as well as their ability to perform complex tasks as a team or as individuals. The results categories were: between 5 and 30 points, your harmony with the world around you is quite low, but the situation may change through education and freedom of thought; between 30 and 55 points, you are ready environment, your life has already provided many lessons and you're on the right track. However, your ego is struggling, yet, be the best; more than 55 points, you have the ability to make the best decisions, you know that it is impossible to be separated from society. The results gained by applying the questionnaires suggest the following aspects: some personal characteristics may be associated with spiritual intelligence are represented by traditional qualities like sincerity, humility and mercy; the sportsman's self-knowing is good, which shows that they are able to improve it during training and therefore rising their performance and also their ability to auto-evaluate in a realistic way; by analysing their personality profiles, we can make the conclusion that there is a strong connection between the results gain while performing in competitions and their personality.

Conclusion

The results gained by applying this questionnaire allow us to draw the big picture on the development level of the sportsmen's spiritual intelligence, but most importing, identifying the developing methods of his learning process.

Key words: personality, selection, sport

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POVEZANOST TAKMIČARSKE ANKSIOZNOSTI SA FIZIOLOŠKIM I BIHEJVIOALNIM INDIKATORIMA STRESA KOD SPORTISTA

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Uvod

Studije u oblasti psihologije sporta pokazale su da crta i stanje anksioznosti, način reagovanja na stres i veštine suočavanja sa problemima i teškoćama mogu pozitivno ili negativno uticati na kvalitet izvođenja sportiste. Doživljeni stres možemo meriti bihevioralno (kvalitet izvođenja), upitnicima samoprocene i preko fizioloških parametara. Cilj ovog istraživanja je utvrđivanje povezanosti između fizioloških reakcija organizma sportiste na stresne situacije, samoprocene stanja anksioznosti pred takmičenje i kvaliteta izvođenja u stresnim situacijama.

Metod

Uzorak je činilo 109 sportista ($M=85$, $\bar{Z}=24$) prosečne starosti 21.6 ± 4.6 . Varijable uključene u istraživanje su: mera samoprocene: nivo takmičarske anksioznosti meren testom takmičarske anksioznosti SCAT-c (1, 2), fiziološke mere: promene u provodljivosti kože, puls, frekvenci disanja i napetosti mišića kao posledica uvođenja kognitivnog i emocionalnog stresa, i bihevioralna mera: kvalitet izvođenja (broj grešaka u kognitivnom zadatku). Fiziološke reakcije merene su Biofeedback Biograph infinity 5.0. aparatom. Izvršena je korelaciona analiza u SPSS 17.0 programskom paketu.

Rezultati sa diskusijom

Korelacionom analizom utvrđene su dve značajne korelacije: između frekvencije disanja u emocionalnom stresu (zadatak proživljavanja stresne sportske situacije) i takmičarske anksioznosti ($r = 0.336$, $p < 0.01$) i između provodljivosti kože tokom rada matematičkog zadatka i broja grešaka u tom zadatku ($r = -0.202$, $p < 0.05$). Što je nivo takmičarske anksioznosti sportista veći (opažanje takmičarske situacije kao preteće), to u toku zadatka imaginacije stresne, sportske situacije reaguju većom frekvencijom disanja u odnosu na frekvenciju disanja u prethodnoj, opuštajućoj fazi merenja. Što je veći porast provodljivosti kože u kognitivnom zadatku u odnosu na fazu opuštanja pre toga, to je broj grešaka koji sportista pravi tokom rada tog stresnog zadatka manji.

Zaključak

Rezultati su pokazali da postoje izvesne značajne korelacije između fizioloških, bihevioralnih i mera samoprocene reakcije na stres. Nalazi ukazuju da veza između fiziološke aktivacije, kognitivnog funkcionisanja i kvaliteta izvođenja nije jednoznačna, što je značajno za praksu, jer omogućava predviđanje ponašanja sportista u stresnim takmičarskim situacijama i individualizaciju programa njihove psihološke pripreme za nastupe.

Ključne reči: anksioznost, stres, provodljivost kože, puls, frekvencija disanja

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RELATIONSHIPS BETWEEN COMPETITIVE ANXIETY, PHYSIOLOGICAL AND BEHAVIOURAL MEASURES OF STRESS REACTION AMONG ATHLETES

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Introduction

Studies in the field of sport psychology showed that the anxiety trait and state, different stress responses and coping mechanisms can influence performance of athletes. Stress reaction can be measured in 3 response modalities: performance (behavioural measure), self – report measures and physiological reactions. The aim of this study was to identify relationships between physiological responses to stressful situations, self-report measures of competitive state anxiety and performance in stressful situations.

Method

One hundred and nine subjects, 24 female and 85 male athletes, with a mean age of 21.6 ± 4.6 participated in the study. The variables which were measured in this research were: self-report measure of competitive anxiety operationalized through SCAT-c questionnaire (1, 2), physiological reactions: changes in skin conductance, heart rate, breathing and muscle tension after introducing cognitive and emotional stress, and behavioural measure: quality of performance (number of errors made during cognitive assignment). Physiological reactions were measured by Biofeedback Biograph infinity 5.0. instrument. Correlations analysis was conducted in SPSS 17.0 software.

Results

The results reveal two statistically significant correlations: between frequency of breathing during emotional stress and competitive anxiety ($r = 0.336$, $p < 0.01$) and between skin conductance during cognitive stress and number of errors during cognitive stress ($r = -0.202$, $p < 0.05$). Athletes who reported higher level of competitive anxiety, had higher frequency of breathing during emotional stress (imagining stressful situation) compared to the frequency of breathing before the introducing of emotional stress. The athletes who had larger increasing in skin conductance during the cognitive stress, had less errors during the cognitive assignment.

Conclusion

The results of the study showed that there were significant correlations between 3 modalities of stress responses: self-report, physiological and performance measures. Linking 3 modalities of stress responses measures revealed that relationships between them are not simple. That information could be useful in everyday work with athletes, since it allows us to predict athletes' performance in stressful, competitive situations and developing individualized programs of their psychological preparation.

Key words: anxiety, stress, skin conductance, heart rate, respiration rate

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POSTUPANJE JEDINICA POLICIJE U SUZBIJANJU NASILJA NA SPORTSKIM MANIFESTACIJAMA¹

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Uvod

U dosadašnjoj praksi segmentarno je istraživano pitanje postupanja jedinica policija u suzbijanju nasilja na sportskim manifestacijama. Otuda, formulisana je i opšta hipoteza koja glasi: „Postupanje jedinica policije i forme primene njihove fizičke aktivnosti u suzbijanju nasilja na sportskim manifestacijama u Republici Srbiji poslednjih godina ima tendenciju povećanja nivoa uspešnosti njihovog delovanja.“

Metod

Primenjivaće se kompleks metoda primerenih istraživanju društveno-humanističkih aspekata policijskog delovanja na sportskim manifestacijama. Ovim su obuhvaćene metode analize sadržaja, implementiranu u istorijskom kontekstu, u smislu analize dokumenata o postupanju i delovanju policijskih službenika na sportskim priredbama u slučajevima nasilja u Republici Srbiji. To će dalje usloviti primenu istorijsko-komparativne metode i metode klasifikacije.

Rezultati sa diskusijom

Budući da je broj sportskih manifestacija u Republici Srbiji u neprekidnom porastu, kao i trend u pogledu broja napada na policijske službenike, neophodno je istražiti uzroke tih napada, kao i postupanje policije u tim uslovima. Tendencija je takođe, da je u tim napadima vremenom manji broj teže povređenih policijskih službenika. Istraživanja u ovoj oblasti treba da budu usmerena ka identifikaciji specifičnih formi primenjene fizičke aktivnosti policijskih službenika povodom nasilja na sportskim priredbama, kao i predvideti nove forme policijskog delovanja u zavisnosti od budućih napada.

Zaključak

Policijski službenici su razvili specifične forme upotrebe fizičke aktivnosti, poslednjih godina u Republici Srbiji, a u zavisnosti od budućih napada na njih očekuje se dalji razvoj u oblicima njihovog postupanja prilikom suzbijanja nasilja na sportskim manifestacijama.

Cljučne reči: nasilje, upotreba fizičke aktivnosti, sportske manifestacije, policija

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¹ Rad je deo Projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije R. Srbije” pod brojem III47015, a kao deo potprojekta “Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije policije R. Srbije” koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

ENGAGEMENT OF POLICE UNITS TO COMBAT VIOLENCE AT SPORTING EVENTS

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Introduction

In current practice, the issue of engagement of police units to combat police violence at sporting events was partially explored. Hence, the general formulation of the hypothesis states: "The engagement of police units and implemented forms of physical activity in the prevention of violence at sporting events in the Republic of Serbia in recent years has tended to increase the level of success of their actions."

Method

The complex of methods adequate to study the socio-humanistic aspects of police work on sports events shall be implemented. This includes the analysis method, implemented in a historical context, in terms of their handling of documents and activities of police officers at sporting events in cases of violence in the Republic of Serbia. It will still cause the application of the historical-comparative method and classification method.

Results and discussion

As the number of sporting events in the Republic of Serbia is in a constant rise, and the trend in the number of attacks on police officers, it is necessary to investigate the causes of the attacks, as well as the actions of the police in these circumstances. The tendency is also that the attacks at police officers with the injured has decreased. Research in this area should be directed to the identification of the specific form of applied physical activities of police officers on the occasion of violence at sporting events, as well as provide for new forms of policing, depending on future attacks.

Conclusion

Police officers have developed specific forms of use of physical activity in recent years in Serbia, and depending on future attacks on them it is expected to develop further forms of engagement in prevention of violence at sporting events.

Key words: violence, use of physical activity, sporting events, police

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SPECIFIČNOSTI KOGNITIVNIH SPOSOBNOSTI FUDBALSKIH GOLMANA U ODNOSU NA OSTALE IGRAČE U TIMU

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Uvod

Postoje brojna istraživanja koja se bave razlikama između fudbalera u zavisnosti na poziciju koju zauzimaju u timu u više prostora, ali je veoma malo onih koji se odnose na mogućnosti i potencijale izvođenja svesnih mentalnih aktivnosti poput opažanja, pamćenja, mišljenja i slično. Kognitivno se često izjednačava sa mentalnim, inteligentnim i spoznajnim, dok hronometrija u psihologiji predstavlja pristup proučavanja prikazivanja karakterističnih psihičkih pojava, koji polazi od pretpostavke, da se na osnovu vremena odvijanja neke pojave može proniknuti u složenost njene strukture, te dešifrovati dinamika funkcionisanja mehanizma uz pomoć kojih se one ostvaruju (1, 2). Cilj istraživanja je da utvrdi postojanje razlika kognitivnih sposobnosti između fudbalskih golmana i ostalih igrača u timu.

Metod

Uzorak je sačinjen od 32 fudbalera, od kojih je bilo 16 golmana i 16 igrača, uzrasta od 16 do 18 godina, sa teritorije AP Vojvodine, testiranih pomoću CRD baterije testova (distribucija pažnje, operativnog mišljenja i psihomotorne reakcije), u kabinetu za dijagnostiku sportista Pokrajinskog zavoda za sport i medicinu sporta u Novom Sadu. Referentna vrednost za svaku korišćenu varijablu bila je ukupno vreme, koje predstavlja manifestaciju interakcije svih faktora koji određuju uspešnost rešavanja datog testa.

Rezultati sa diskusijom

Rezultati multivarijantne analize varijanse (MANOVA) su pokazali nepostojanje statistički značajne razlike u celom sistemu primenjenih varijabli ($p=0.47$), dok je univarijantna analiza varijanse (ANOVA), takođe, pokazala da ne postoje statistički značajne razlike između grupa ni u jednoj analiziranoj varijabli. Nepostojanje razlika u kognitivnim i psihomotornim sposobnostima, između igrača i golmana mogu se pripisati urođenim sposobnostima i funkcionisanju CNS, koje poseduju dečaci analiziranog uzrasta, bez obzira na poziciju koju zauzimaju u timu.

Zaključak

Ne postoji statistički značajna razlika između subuzoraka u opštim kognitivnim sposobnostima, ali verovatno postoji razlika u strukturi kognitivnih sposobnosti i mentalnom potencijalu, što bi bio predmet daljeg istraživanja ove oblasti.

Ključne reči: kognitivne sposobnosti, fudbaleri, golman.

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COGNITIVE SKILLS SPECIFICITIES OF FOOTBALL GOALKEEPERS IN COMPARISON TO OTHER PLAYERS IN THE TEAM

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Introduction

Numerous studies exist dealing with the differences between football players in various interest fields depending on their position in the team, but very few of those which concerning the capabilities and potentials of performance conscious mental activities such as perception, memory, thinking and so on. Cognitive is often equated with mental and intelligent, while chronometry in psychology presents study of psychic phenomena characteristic presentation approach, which is based on the assumption that on the time of some phenomena lasts we can fathom the complexity of its structure, and decipher dynamic of mechanism functioning through which they are realised (1, 2). The research aim is to identify differences between cognitive abilities of football goalkeepers and other players in the team.

Method

The sample consisted of 32 football players, of which there were 16 players and 16 goalkeepers aged from 16 to 18 years, from territory of autonomous region of Vojvodina, were tested using *CRD* battery of tests (distribution of attention, operational thinking and psychomotor reactions), in diagnostics athletes cabinet of Provincial Institute of Sports and Sports Medicine in Novi Sad. Reference value for each of the used variable was the total time, which is a manifestation of the interaction of all factors that determine successful given test solving.

Results and discussion

Results of multivariate analysis of variance (MANOVA) showed lack of statistically significant differences in the overall system applied variables ($p = 0.47$), while the univariate analysis of variance (ANOVA), also showed no statistically significant differences between groups in any of the analyzed variables. The lack of differences in cognitive and psychomotor performance, between the players and the goalkeeper can be attributed to an inborn ability and functioning of the CNS, which analyzed boys possess, regardless of the position they play in the team.

Conclusion

The conclusion is that there is no statistically significant difference between the subsamples in general cognitive abilities, but there is probably a difference in the structure of cognitive abilities and mental potential, which would be the subject of further research in this area.

Key words: Cognitive abilities, football players, goalkeepers

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THE MODIFICATION OF ONE'S BELIEF SYSTEM AS AN IMPORTANT FACTOR IN IMPROVING ATHLETIC PERFORMANCE

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Introduction

Beliefs are organized, pre-formed approaches on perception, which filter considerably our communication to ourselves. Beliefs may come from our environment or from events, may arrive in our minds through accumulated knowledge, may appear as a consequence of results achieved in the past or may be formed by creating in our minds the experience we wish to achieve.

Method

Neuro-linguistic programming has a series of specific techniques through which we can change someone's belief system and their limiting beliefs. This change can be useful especially in cases where athletic achievements are blocked by beliefs such as: I can't, I don't believe, I will not win.

Results and discussion

The specific techniques for changing the belief system were applied on 25 athletes included in the Olympic teams. The methodology was as follows: identifying the limiting beliefs which hinder athletic performance, establishing the frame for the new belief, changing the limiting belief by changing the specific sub modalities, anchoring the new state, verifying the way in which the new belief has been stabilized. This mental technique works well in all the cases where the athlete collaborates openly. Consolidating the results over time depends on external factors: the environment to which the athlete returns, the collaboration with the sports coach, the atmosphere within the family – but most importantly the athlete's own motivation. In cases where the motivation was internal, the results were persistent and only needed to be strengthened during the consolidation phase of the process.

Conclusion

It is important that these cases be followed continuously in order to assess the stability of these processes on medium - (5years) and long term (10 years). The speed at which results were achieved after applying the technique for changing limiting beliefs was obvious, and this can be a useful tool for many sports coaches.

Key words: athletic performance, belief system, emotions, neuro-linguistic-programming, timeline

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SEKCIJA 6

**INTERDISCIPLINARNI PRISTUP U ISTRAŽIVANJU EFEKATA
PRIMENE FIZIČKIH AKTIVNOSTI
(BIOMEDICINSKE NAUKE)**

SESSION 6

**INTERDISCIPLINARY APPROACH IN RESEARCH OF THE EFFECTS
OF PHYSICAL ACTIVITY APPLICATION
(BIOMEDICAL SCIENCES)**

FIZIČKA AKTIVNOST I HRONIČNE NEZARAZNE BOLESTI

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Uvod

Fizička aktivnost je važan činilac u borbi protiv gojaznosti kao jednom od vodećih faktora rizika za hronične nezarazne bolesti. Fizička aktivnost se preporučuje kao pomoćno sredstvo kako u prevenciji gojaznosti tako i u terapiji. Veza između fizičke aktivnosti odnosno neaktivnosti sa hroničnim nezaraznim bolestima je dobro poznata. Cilj studije je procena značaja fizičke aktivnosti u nastanku hroničnih nezaraznih bolesti.

Metod

Pregled References poslednjih 15 godina korišćenjem ključnih reči fizička aktivnost, hronične nezarazne bolesti, prevencija hroničnih nezaraznih bolesti. Analizirani su radovi samo u časopisima sa recenzijom, koji su u PUBMED bazi.

Rezultati sa diskusijom

Postoji dosta podataka o značaju fizičke aktivnosti u prevenciji mnogih oboljenja, pogotovo aterosklerotskih, što doprinosi boljem kvalitetu života i produžetku životnog veka. U 24 godišnjoj studiji praćenja uzroka svih smrtnih ishoda kod 10282 žene, Hu i saradnici zaključuju da gojaznost i smanjenja fizička aktivnost predstavljaju nezavisne prediktore smrtnog ishoda. Prekomerna telesna masa i gojaznost udružene sa fizičkom neaktivnošću (fizička aktivnost manja od 3.5 sati nedeljno) su u ovoj studiji, i to kod nepušača, bili uzroci smrti kod kardiovaskularnih bolesnika u 59% slučajeva, a u 21% kod pacijenata sa malignim tumorima. Slični rezultati o vezi između fizičke aktivnosti i obolevanja i umiranja naročito od kardiovaskularnih bolesti dobijeni su i u drugim studijama. Fizička aktivnost ne samo da značajno smanjuje rizik od razvoja hroničnih nezaraznih oboljenja, već je i inverzno povezana sa težinom oboljenja, pogotovo kardiovaskularnih bolesti.

Zaključak

Fizička aktivnost ima ne samo značajne efekte u gubitku telesne mase, već su poznati i korisni zdravstveni efekti čak i nezavisni od gubitka težine. Fizička aktivnost od najranijeg životnog perioda može prevenirati nastanak hroničnih nezaraznih bolesti i njihovu progresiju kao i prateće komplikacije. Bavljenje fizičkom aktivnošću u bilo kojoj populacionoj grupi mora biti pod kontrolom stručnog lica.

Ključne reči: fizička aktivnost, hronične nezarazne bolesti, prevencija

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PHYSICAL ACTIVITY AND CHRONIC NON-COMMUNICABLE

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Introduction

Physical activity is an important factor in the fight against obesity as one of the leading risk factors for chronic diseases. Physical activity is recommended as an aid in the prevention of obesity and in therapy. The relationship between physical activity and inactivity with chronic non-communicable diseases is well known. The aim of the study is to assess the importance of physical activity in the development of chronic diseases.

Method

A References review the last 15 years using the key words physical activity, chronic non-communicable diseases, the prevention of chronic disease. We analyzed only papers in peer-reviewed journals that are in PubMed database.

Results and discussion

There is a lot of information about the importance of physical activity in the prevention of many diseases, especially atherosclerosis, which contributes to a better quality of life and extend life expectancy. In the 24 year follow-up study of the causes of all deaths of 10 282 women, Hu and colleagues conclude that obesity and reduced physical activity are independent predictors of mortality. Overweight and obesity are associated with physical inactivity (exercise less than 3.5 hours per week) in this study, and to non-smokers, were the causes of death in cardiovascular patients in 59% of cases, and in 21% of patients with malignant tumors. Similar results on the link between physical activity and the incidence and mortality of cardiovascular diseases in particular have been obtained in other studies. Physical activity not only significantly reduces the risk of developing chronic diseases, but also inversely associated with severity of disease, particularly cardiovascular disease.

Conclusion

Physical activity has a significant impact not only in weight loss, but are also known beneficial health effects even independent of weight loss. Physical activity from an early period of life can prevent onset of chronic diseases and also their progression and associated complications. Physical activity in any population group must be under the control of an expert.

Key words: physical activity, chronic non-communicable diseases, prevention

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CUT OFF VREDNOSTI UZRASTA KOD POPULACIJE ODRASLIH MUŠKARACA R. SRBIJE U FUNKCIJI INDIKATORA GOJAZNOSTI¹

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Uvod

Redovna fizička aktivnost je ključna odrednica energetske potrošnje. Ona je osnova energetske ravnoteže i glavni mehanizam u kontroli telesne mase (1). Prema zvaničnim podacima u Srbiji u 2010. godini od svih novootkrivenih slučajeva osoba sa akutnim koronarnim sindromom i osoba sa dijabetesom 37.6% je u poslednjih 5 godina pre otkrivanja bolesti bilo fizički neaktivno (2, 3). Cilj ovog istraživanja je da kod odraslih muškaraca R. Srbije definiše kritični uzrast nakon kojeg dolazi do povećanja vrednosti BMI i procenta masnog tkiva, kao nezaznih pokazatelja faktora rizika, preko prihvaćenih standarda za granicu rizika po zdravlje.

Metod

Uzorak ispitanika je bio sastavljen od 299 zdravih muškaraca iz Srbije. Osnovni deskriptivni pokazatelji uzorka su bili: Uzrast - 30.1 ± 8.8 godina, BMI = 25.85 ± 3.26 $\text{kg} \cdot \text{m}^{-2}$, procenat telesne masti (PBF) = 16.75 ± 6.58 %. U odnosu na strukturu učestalosti vežbanja 17.4% ispitanika nije vežbalo, 42.8% je vežbalo 1-3 puta, 33.8% je vežbalo 4-5 puta i 6.0% je vežbalo više od 6 puta nedeljno. Sva merenja su izvršena u periodu 2010 – 2012. godine u Metodičko-istraživačkoj laboratoriji (MIL) Fakulteta sporta i fizičkog vaspitanja Univerziteta u Beogradu. Merenja su realizovana standardizovanom procedurom primenom analizatora telesne strukture: InBody 720. Indikatore aktuelnog stanja gojaznosti su definisale sledeće varijable: indeks telesne mase (BMI, $\text{kg} \cdot \text{m}^{-2}$) i procenat telesne masti (PBF, %). Cut Off vrednosti zavisne i nezavisne varijable su određene metodom ROC krive, dok je kriterijum statističke značajnosti senzitivnosti i specifičnosti definisan na nivou 95% verovatnoće za $p < 0.05$.

Rezultati sa diskusijom

Rezultati su pokazali da se kod ispitivanih muškaraca uzrast od 27 godina života kritičan period u smislu održavanja vrednost BMI do granice 24.99 $\text{kg} \cdot \text{m}^{-2}$ (Senzitivnost – 67.46, Specifičnost – 61.54, AUC = 0.669, $p < 0.001$) nakon čega dolazi do povećanja BMI u funkciji uzrasta. U odnosu na PBF sa kriterijem manjim od 17.99% masti u organizmu statistički značajan kritičan period uzrasta je 28 godina (Senzitivnost – 69.69, Specifičnost – 60.45, AUC = 0.685, $p < 0.0001$), dok je za kriterijum PBF od 24.99% masti u organizmu statistički značajno kritičan period nakon 33 godine života (Senzitivnost – 56.25, Specifičnost – 75.66, AUC = 0.602, $p < 0.0002$).

Zaključak

Na osnovu dobijenih rezultata može se zaključiti da postoji određeni obrazac ponašanja i načina života kod muškaraca u Srbiji koji uslovljava da se vrednost BMI nakon uzrast od 27 godina života povećava ka kategoriji predgojaznih osoba, dok procenat masti u telu nakon uzrasta od 33 godine prelazi u kategoriju gojaznih osoba.

Ključne reči: BMI, muškarci, bioimpedanca, procenat masti

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¹ Rad je realizovan u okviru projekta „Efekti primenjene fizike aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije Republike Srbije“ br. III47015, potprojekat “Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status radno aktivne populacije R. Srbije” koji je finansiran od strane Ministarstva za nauku i tehnološki razvoj Republike Srbije – Ciklus naučnih projekata 2011-2014.

CUT-OFF AGE VALUES IN MALE POPULATION OF THE REPUBLIC OF SERBIA AS INDICATORS OF OBESITY

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Introduction

Regular physical activity is the key determinant of energy expenditure. It is fundamental for maintaining energy balance and presents the main mechanism in the control of body mass. According to the official statistics, out of the total of newly diagnosed cases of acute coronary syndrome and diabetes, 37.6% accounted for individuals who had been physically inactive 5 years prior to diagnosis. The aim of this study was to define the critical age at which there is an increase in BMI and body fat percentage as non-contagious risk factor indicators, using the adopted standards for health risk cut-off values.

Method

The study sample included 299 healthy males from Serbia. The main sample descriptors were: Age = 30.1 ± 8.8 yrs, BMI = 25.85 ± 3.26 kg·m⁻², and Percentage Body Fat (PBF) = 16.75 ± 6.58 %. With respect to the frequency of exercise per week, 17.4% of the respondents did not exercise at all, 42.8% exercised 1–3 times, 33.8% exercised 4–5 times, while 6.0% exercised more than 6 times. All measurements were taken during the period 2010–2012 in the Laboratory for Methodology and Research (MIL) of the Faculty of Sports and Physical Education, University of Belgrade. A standardized measurement procedure was used on InBody 720, a body composition analyzer. The current obesity indicators were defined by the following variables: Body Mass Index (BMI, kg·m⁻²) and Percentage Body Fat (PBF, %). Cut-off values for the dependent and independent variables were determined using the ROC curve method, while the sensitivity and specificity criteria for statistical significance were defined at 95% probability for $p < 0.05$.

Results with discussion

The results showed that the age of 27 years was critical in the observed men with respect to maintaining BMI up to the level of 24.99 kg·m⁻² (Sensitivity – 67.46, Specificity – 61.54, AUC = 0.669, $p < 0.001$), after which BMI grew with age. Considering PBF levels lower than 17.99%, the age of 28 was critical with statistical significance (Sensitivity – 69.69, Specificity – 60.45, AUC = 0.685, $p < 0.0001$), while the period after 33 years of age was critical for PBF of 24.99% (Sensitivity – 56.25, Specificity – 75.66, AUC = 0.602, $p < 0.0002$).

Conclusion

The results of the study suggest that there is a certain pattern of behavior and lifestyle in the male population in Serbia which induces the increase in BMI values after the age of 27 towards pre-obesity, while the body fat percentage after the age of 33 reaches obesity.

Key words: BMI, men, bioimpedance, body fat percentage

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SOME SPIROMETRY DIFFERENCES BEFORE AND AFTER RUGBY TRAINING

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Introduction

Rugby Union is an interactive game where the player must have a high level of preparedness in which the integral functional skills must be at an optimum level. For a rugby player, a certain level of functional aerobic capacity is required and also sufficient ventilation. Research in which the measured ventilation of rugby players was conducted by Falvey et al. (2) who examined EIB. Spirometry before and after training with other methods can help in the detection of players who have exercised-induced bronchoconstriction (EIB). H₀ - There would be no statistically significant differences in rugby player spirometry before and after training.

Method

Testing was conducted on a sample of 20 senior representative rugby players (18-33 years old). All subjects measured height and weight and then calculated the BMI. Spirometry indicators were measured at rest with the equipment for lung function testing "Microquark" PC Cosmed. Players were connected to a mouthpiece part with a closed nose and then performed a forced expiratory maneuver. The same procedure was done 15 minutes before training and 5 to 20 minutes after a training. Using the software package Statistica for "Windows Ver.10.0" authors calculated the descriptive statistical parameters.

Results and discussion

Following the goal of the research, the authors used the t-test for paired samples to determine the significance of differences in each spirometry variable before and after training. P value <0.05 was defined as a level of significance. The author has calculated the differences of individual measurements of spirometric variables before and after training for each participant individually. Authors find that there is no statistically significant difference in spirometric characteristics before and after training. However, these are average values of all players such as might be expected because of the similar results obtained by Falvey et al. (2). Some authors (1) find that PEF value used for the diagnosis of EIB and this value should be 15% lower after exercise. According to that, only two players meet this criterion. Implication for practice: easy detection of players with EIB, which can be substantially reduced by proper therapy. Limitations: small number of players, no data of players' history of EIB and smoking, excessive length of training, all players are not tested at the same time after training. Future research direction: how closely related are the results of spirometry testing (especially those with EIB) with a maximum of oxygen level in the rugby players.

Conclusion

Sports coaches should instruct their players on these kinds of spirometric tests, which may be standardized to their eventual deficits, so they can be discovered and managed to prevent the future occurrence of symptoms of EIB.

Key words: rugby union, spirometry, ventilation, EIB

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ANTHROPOMETRIC AND PHYSIOLOGICAL CHARACTERISTICS OF AN ELITE KARATEKA: A CASE STUDY

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Introduction

Anthropometric and physiological profiles are commonly constructed to offer norms and assist in training, selection and preparation of athletes. Despite their significance, there is little information on karate athletes (karateka), in particular at elite level. Therefore, the aim of the present study is to provide an anthropometric and physiological profile of an elite karateka.

Method

The case study was a 22 year old karateka who was a Commonwealth champion under 53kg at the time of the study. Height, body mass (BM), sum of seven skinfolds (sum7), upper arms and thighs circumferences were taken for anthropometric characteristics. Flexibility (hip and knee flexion), reverse punch power and back leg Mawashi Geri (backMG) power were measured for physiological characteristics. Where appropriate, measurements were taken on both right and left sides.

Results and discussion

The karateka had a height of 1.54m, BM of 54.6kg and sum7 of 103.4mm. Upper arm circumference was 28.5 cm and 28.5cm while thigh circumference was 49.5cm and 49cm, for right and left sides, respectively. Hip flexion was 102.7° and 102° while knee flexion was 109° and 108.7° for right and left sides, respectively. Reverse punch power was 613.5W for right arm and 552.5W for left arm. Finally, backMG produced 1575W and 1320W for right and left leg, respectively. These results indicate poor hip and knee flexibility. This could be detrimental to performance as it could lead to reduced range of motion and less powerful kick, as the distance the leg would cover prior to impact would be reduced. This is the first study to report sport-specific measurements, so it is not possible to make comparisons to other studies. Hence, the results are provided as norms for other Karatekas. However, the side-to-side measurement can be used to calculate right to left ratios (2). This imbalance ratios can offer a better understanding of any injury likelihood or performance impairment. Punching power imbalance was 10.0% while kicking imbalance was 16.2%, indicating a considerable deviation between the two legs. A value of 15% appears to be the threshold past which both injury and performance suffer (147), hence attention should be paid in reducing these imbalances.

Conclusion

Despite the popularity of Karate, little information exists on the anthropometric and physiological characteristics of elite Karatekas. The present study aimed to offer some information towards creating an elite Karateka's profile. Care needs to be given to muscular imbalances to avoid increased injury likelihood as well as performance impairment.

Key words: karateka, anthropometric, physiological characteristics

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EFEKTI OSMONEDELJNOG PROGRAMA KROS TRČANJA NA AEROBNE SPOSOBNOSTI I TELESNI SASTAV STUDENTKINJA¹

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Uvod

Hodanje i trčanje predstavljaju ciklične aktivnosti najčešće korišćene u cilju razvoja aerobne sposobnosti, koja je značajna fizička sposobnost iz zdravstvenog aspekta. Cilj ovog istraživanja je bio da se utvrdi uticaj osmonedeljnog programa kros trčanja na povećanje aerobne sposobnosti i telesni sastav studentkinja.

Metod

Istraživanje je obavljeno na uzorku od 28 studentkinja (prosečne starosti 20.43 ± 1.16 godina) druge godine osnovnih akademskih studija na Fakultetu sporta i fizičkog vaspitanja Univerziteta u Beogradu, koje u okviru predmeta Teorija i metodika atletike pohađaju nastavu krosa u trajanju od 8 nedelja. U cilju određivanja funkcionalnih sposobnosti kardiovaskularnog i respiratornog sistema i procene maksimalne aerobne moći ispitanica korišćen je 20-metarski „shuttle run“ test. Telesni sastav određen je pomoću multifrekventne bioelektrične impedanse (InBody 720, Biospace, Seoul, Korea). Testiranja varijabli obavljena su u Metodičko-dijagnostičkoj laboratoriji Fakulteta sporta i fizičkog vaspitanja, Univerziteta u Beogradu. Statistička analiza podataka obuhvatila je izračunavanje osnovnih deskriptivnih parametara, a razlike između inicijalnog i završnog testiranja dobijene su korišćenjem Studentovog t-testa. Provera uticaja treninga krosa na izračunate varijable utvrđena je pomoću eta kvadrat testa.

Rezultati sa diskusijom

Rezultati su pokazali da je došlo do statistički značajnog poboljšanja VO_{2max} ($t = -3.889$, $p = 0.001$) pod uticajem primenjenog programa. Nije dobijena statistički značajna razlika u vrednostima BMI, ali je došlo do značajnog povećanja količine čiste mišićne mase (FFM, $t = -2.637$, $p = 0.014$), uz istovremeno smanjenje količine (FM1, $t = -3.785$, $p = 0.001$) i procentualnog udela (FM2 $t = 2.989$, $p = 0.006$) masnog tkiva.

Zaključak

Program kros trčanja, planiran po kriterijumima savremenih znanja iz oblasti sportskih nauka, koji je sproveden u trajanju od osam nedelja na uzorku studentkinja doveo je do značajnog poboljšanja funkcionalnih sposobnosti i morfološke strukture. Ovako programiran trenažni proces može se primeniti na široj populaciji, koji bi, uz individualni pristup, doprineo otklanjanju posledica sedentarnog načina života i uticao na celokupno poboljšanje zdravlja studenata.

Cljučne reči: kros, aerobne sposobnosti, telesni sastav, studentkinje

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¹ Rad je deo Projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije Republike Srbije“ pod brojem III47015, a kao deo potprojekta “Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status studentske populacije R. Srbije” koji se finansira od strane Ministarstva prosvete i nauke R. Srbije – Ciklus naučnih projekata 2011-2014.

EFFECTS OF AN EIGHT-WEEK CROSS-COUNTRY RUNNING ON AEROBIC CAPACITY AND BODY COMPOSITION OF FEMALE STUDENTS

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Introduction

Walking and running are the cyclical activities most used to develop aerobic fitness, which is important physical ability from health aspects. The aim of this study was to determine the effect of the eight-week cross-country running at increasing aerobic capacity and body composition of female students.

Method

The survey was conducted on a sample of 28 female students (mean age 20.43 ± 1.16 years) in the second year of undergraduate studies at the Faculty of Sport and Physical Education, University of Belgrade, they in subject of Theory and methodology of athletics attend cross country running on a period of 8 weeks. In order to determine the functional capabilities of the cardiovascular and respiratory systems, and estimates of maximum aerobic power, 20-meter shuttle run test was used. Body composition was determined using bioelectrical impedance multifrequency (InBody 720, Biospace, Seoul, Korea). Tests were conducted in the Methodological-diagnostic laboratory of the Faculty of Sport and Physical Education, University of Belgrade. Statistical analysis included the calculation of basic descriptive parameters, and the differences between the initial and final tests were obtained using the Student's t-test. The impact of cross country training on the calculated variables was determined using eta squared test.

Results and discussion

The results showed that there was a statistically significant improvement in VO_{2max} ($t = -3.889$, $p = 0.001$) under the influence of the applied program. There was no statistically significant difference in BMI values, but there was a significant increase in the amount of fat free mass (FFM, $t = -2.637$, $p = 0.014$), while reducing the amount of (FM1, $t = -3.785$, $p = 0.001$) and percentage share (FM2 $t = 2.989$, $p = 0.006$) adipose tissue.

Conclusion

Cross country program, planned by the criteria of modern knowledge in the field of sport science, which ran for eight weeks in a sample of female students has led to a significant improvement in functional ability and morphological structures. Such programmed training process can be applied to the general population, which, along with individual approach, contributed to eliminating the consequences of sedentary lifestyles and impact on the overall improvement of health of students.

Key words: cross country running, aerobic capacity, body composition, students

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TREND PROMENA INDIKATORA GOJAZNOSTI KOD MUŠKARACA BEOGRADA U RELACIJI SA UZRASTOM¹

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Uvod

Fizička neaktivnost je jedan od osnovnih faktora rizika zdravlja i direktno je povezana sa smanjenjem radno-funkcionalnih sposobnosti stanovništva. Sa faktorima modernog načina života (hipokinezija, stress, loša ishrana), ona najviše doprinosi pojavi fenomena gojaznosti i prekomerne gojaznosti kod sve većeg procenta ljudi. Cilj ovog istraživanja bio je definisanje modela trenda promena morfoloških varijabli povezanih sa gojaznošću kod populacije muškaraca grada Beograda uzrasta od 20 do 59 godine.

Metod

Istraživanje je realizovano u periodu 2010 – 2012. godine u Metodičko-istraživačkoj laboratoriji (MIL) Fakulteta sporta i fizičkog vaspitanja Univerziteta u Beogradu. Merenja su izvršena standardizovanom procedurom primenom analizatora telesne strukture najnovije generacije: InBody 720. Indikatore aktuelnog stanja gojaznosti su definisale sledeće varijable: telesna masa (TM, kg), indeks telesne mase (BMI, $\text{kg}\cdot\text{m}^{-2}$), količina telesne masti (BFM, kg), procenat telesne masti (PBF, %) i visceralna mast (VFA, cm^2). Uzorak ispitanika su predstavljale zdrave osobe muškog pola (N=578) sa sledećim deskriptivnim karakteristikama: Uzrast = 34.9 ± 8.9 god.; TV = 181.8 ± 6.71 cm; TM = 89.1 ± 13.5 cm; BMI = 26.95 ± 3.78 $\text{kg}\cdot\text{m}^{-2}$; BFM = 17.84 ± 8.45 kg; PBF = 19.42 ± 6.95 %; VFA = 95.25 ± 37.73 cm^2 . Trend promena ispitivanih indikatora gojaznosti je izračunat primenom linearne regresione metode.

Rezultati sa diskusijom

Kod ispitivanih muškaraca je utvrđen statistički značajan trend promene svih posmatranih indikatora gojaznosti u funkciji godina života tj. od 20 do 59.9 godina sa sledećim karakteristikama intenziteta i smera promene: utvrđeno je da se TM povećava intenzitetom od 0.349 kg po godini života ($R^2=0.0528$, $F=32.11$, $p=0.000$); BMI se povećava intenzitetom od 0.14 $\text{kg}\cdot\text{m}^{-2}$ po godini života ($R^2=0.1065$, $F=69.80$, $p=0.000$); BFM se povećava intenzitetom od 0.364 kg po godini života ($R^2=0.1453$, $F=97.94$, $p=0.000$); PBF se povećava intenzitetom od 0.322 % po godini života ($R^2=0.1683$, $F=116.53$, $p=0.000$); VFA se povećava intenzitetom od 2.488 cm^2 po godini života ($R^2=0.3414$, $F=298.64$, $p=0.000$).

Zaključak

Rezultati su pokazali da kod ispitivanih muškaraca Beograda postoji statistički značajan trend promene svih posmatranih indikatora gojaznosti u funkciji godina života. U odnosu na VFA utvrđen je najveći intenzitet promene i to od 2.488 cm^2 , dok je najmanji utvrđen kod BM i to od 0.349 kg po godini života.

Ključne reči: gojaznost, bioimpedanca, muškarci, trend

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A CHANGE TREND IN OBESITY INDICATORS IN BELGRADE MALE POPULATION RELATIVE TO AGE

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Introduction

Physical inactivity is one of the major health risk factors directly associated with a decline in functional abilities in the population. Coupled with the factors of modern way of life (hypokinesia, stress, poor diet), it is the leading contributor to the phenomenon of rapidly increasing rates in obesity and overweight in people. The aim of this study was to define the trend model for morphological changes related to obesity in the male population aged 20 to 59 in the city of Belgrade.

Method

The measurements were taken during the period 2010–2012 in the Laboratory for Methodology and Research (MIL) of the Faculty of Sports and Physical Education, University of Belgrade. A standardized measurement procedure was used on InBody 720, a latest generation body composition analyzer. The current obesity indicators were defined by the following variables: body mass (BM, in kg); body mass index (BMI, in $\text{kg}\cdot\text{m}^{-2}$); body fat mass (BFM, in kg); percentage body fat (PBF, in %); and, visceral fat area (VFA, cm^2). The sample included healthy males ($N=578$) with the following descriptive characteristics: Age= 34.9 ± 8.9 yrs; BH= 181.8 ± 6.71 cm; BM = 89.1 ± 13.5 kg; BMI = 26.95 ± 3.78 $\text{kg}\cdot\text{m}^{-2}$; BFM = 17.84 ± 8.45 kg; PBF = 19.42 ± 6.95 %; and, VFA = 95.25 ± 37.73 cm^2 . The linear regression method was used to calculate the change trend in the observed obesity indicators.

Results and discussion

A statistically significant trend was established for the change in all observed obesity indicators related to age, i.e., between 20 and 59.9 years. The characteristics in the intensity and direction of change per year of age were as follows: an increase in BM of 0.349 kg/yr ($R^2=0.0528$, $F=32.11$, $p=0.000$); an increase in BMI of 0.14 $\text{kg}\cdot\text{m}^{-2}/\text{yr}$ ($R^2=0.1065$, $F=69.80$, $p=0.000$); an increase in BFM of 0.364 kg/yr ($R^2=0.1453$, $F=97.94$, $p=0.000$); an increase in PBF of 0.322 %/yr ($R^2=0.1683$, $F=116.53$, $p=0.000$); an increase in VFA 2.488 cm^2/yr ($R^2=0.3414$, $F=298.64$, $p=0.000$).

Conclusion

The results showed that the studied population of Belgrade males displayed a statistically significant change trend in all observed obesity indicators relative to age. The highest and lowest intensities of change were found, respectively, in VFA, 2.488 cm^2 , and in BM, 0.349 kg per year of age.

Key words: obesity, bioimpedance, males, trend

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ZASTUPLJENOST TELESNIH DEFORMITETA POLAZNIKA ŠKOLE PLIVANJA

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Uvod

Loše držanje dece se veoma često zanemaruje i tako se javljaju mnogo veći problemi. Redovnim praćenjem i procenom posturalnog statusa dece, mnogi zdravstveni problemi, kao i telesni deformiteti, mogu se konstatovati na vreme u fazi posturalnog poremećaja, kroz loše držanje, pre nego što se razvijaju u deformitete.

Metod

U cilju utvrđivanja zastupljenosti telesnih deformiteta, prikupljeni su podaci na uzorku od 67 polaznika škole plivanja „Barakuda“ iz Beograda. Istraživanje je obuhvatilo 36 devojčica i 31 dečaka. Posturalni status je procenjen metodom posmatranja, na osnovu kliničkog lista po modelu Radisavljević M. i Radojević J. Statistička analiza sprovedena je deskriptivnom metodom.

Rezultati sa diskusijom

Dobijeni rezultati su prikazani tabelarno, statistički i zatim analizirani uz izvođenje zaključaka. Na osnovu procene stanja posturalnog statusa dece, može se odrediti zastupljenost telesnih deformiteta kod dečaka i devojčica. I kod dečaka i kod devojčica primećuje se slabo držanje kičmenog stuba u frontalnoj kao i u sagitalnoj ravni (među kojima su najzastupljenije krilaste lopatice - 58 %), hiperekstenzija u zglobu kolena (44 %) kao i spuštenost svoda stopala (49 %).

Zaključak

Na osnovu rezultata analize posturalnog statusa može se zaključiti da je značajno narušen posturalni status kod velikog broja dečaka i kod devojčica polaznika škole plivanja „Barakuda“. Zastupljenost posturalnih poremećaja i telesnih deformiteta je u celini zabrinjavajuća. Neophodno je preduzeti odgovarajuće korektivne vežbe (u vodi i van vode) u cilju prevencije, sanacije i korekcije utvrđenog stanja.

Ključne reči: korektivna gimnastika, posturalni status, deformiteti, prevencija, korekcija

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THE PRESENCE OF THE BODY DEFORMITIES AMONG THE STUDENTS OF SWIMMING SCHOOL

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Introduction

The bad body posture among the children is often neglected, which causes much bigger problems. By regular monitoring and evaluation of the postural status, the body deformities and other health problems can be stated in time, during the phase of postural disorder, before being developed into deformities.

Method

Aimed at establishing the presence of the body deformities, we have collected the data based on the sample of 67 students of the swimming school "Barakuda" from Belgrade. The research involved 36 girls and 31 boys. Postural status was evaluated by the method of observation, based on the clinical list modelled by Radisavljevic M. and Radojevic J. Statistical analysis was performed by descriptive method.

Results and discussion

The obtained results are shown in the tables, statistically and then analyzed. By evaluating the condition of the postural status among the children, we can determine the presence of the body deformities among the boys and girls. Among both boys and girls, we noticed the bad posture of the spinal column in the frontal and the sagittal plane (among which are the most common winged scapula - 58%), hyperextension in the joint of the knee (44 %) and lowered arch of the foot (49 %).

Conclusion

Based on the results of the analysis of the postural status, we may conclude that the postural status is significantly disrupted among the large number of boys and girls from the school "Barakuda". The presence of the postural disruptions and body deformities is worrying. It is necessary to start doing certain corrective exercises (in and out of water) in order to prevent or improve the determined condition.

Key words: corrective gymnastics, postural status, deformities, prevention, correction

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UTICAJ INDIVIDUALNO PROGRAMIRANOG VEŽBANJA U FITNES STUDIJU „FIESTA“ NA PROMENE MORFO–FUNKCIONALNIH KARAKTERISTIKA REKREATIVACA¹

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Uvod

Telesna masa je dobar indikator adekvatnog unosa kalorija, a telesna struktura nam pomaže da utvrdimo da li se kalorije unose u dovoljnim količinama i u pravilnim intervalima. Cilj istraživanja je da se utvrdi na koji način individualno programirano vežbanje u trajanju od 8 nedelja sa korigovanom ishranom u skladu sa individualnim potrebama utiče na promene telesnog sastava vežbača rekreativaca. kao i da se postepeno utiče na trajne i temeljne korekcije u načinu života.

Metod

Uzorak ispitanika čine četiri osobe prosečne starosti 30.75 godina (± 4), sedanterni uz neredovnu i nepravilnu ishranu. Uzorak varijabli čine 16 antropometrijskih varijabli na osnovu kojih se metodom merenja i procenom telesnog sastava po Mateiki izračunavaju indirektno varijable telesnog sastava. U domenu komparativne statističke analize korišćen je t test za zavisne uzorke. U ovom istraživačkom radu, kao sredstvo treninga akcenat je dat na osnovnom vidu kretanja (hodanje, brzo hodanje).

Rezultati sa diskusijom

Puls u miru se smanjio u proseku za 10.5 otk/min. Prosečna vrednost procenta koštane mase se povećala za 1.5% po ispitaniku. Debljina potkožnog masnog tkiva u proseku se smanjila za 7.2% po ispitaniku, dok kod mišićne mase nije došlo do znatnih promena na šta nam ukazuje i t-test (Studentov t), uz minimalni gubitak od 1.57%. Maksimalna potrošnja kiseonika (VO_2max) se poboljšala za 6.9 ml/ min/ kg TM. Ovakvo individualno programirano vežbanje u trajanju od 8 nedelja i korigovanom ishranom u skladu sa individualnim potrebama pojedinaca uticalo je na promene telesnog sastava i poboljšanje kardiovaskularnih sposobnosti.

Zaključak

Telesna masa je dobar indikator adekvatnog unosa kalorija, a telesna struktura nam pomaže da utvrdimo da li se kalorije unose u dovoljnim količinama i u pravilnim intervalima. Osmonedeljni program strogo individualno vodjene rekreacije doveo je do poboljšanja u sferi pulsa u miru, smanjenja masne komponente telesnog sastava, ali nije bilo značajnijih promena na nivou maksimalne potrošnje kiseonika ni mišićne komponente telesnog sastava.

Ključne reči: gojaznost, morfofunkcionalne karakteristike, individualni program vežbanja

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INFLUENCE OF INDIVIDUAL PROGRAMMED EXERCISES OF THE FITNESS STUDIO “FIESTA” ON CHANGES OF MORPHO-FUNCTIONAL FEATURES OF RECREATIONISTS

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Introduction

Body mass is a good indicator of adequate calorie intake while the body structure help us establish whether the calories are taken in sufficient amounts and at regular intervals. The research was aimed at establishing how the individual 8-week programmed exercising with corrections of nutrition in compliance with the individual needs, can affect the changes of body composition of recreationists, and additionally, gradually induce permanent and fundamental corrections in lifestyle.

Method

The sample of subjects consisted of four persons of average age of 30.75 years (± 4), sedentary with irregular and improper nutrition. The sample of variables consisted of 16 anthropometric variables, based on which, by applying the method of measurement and assessment of body composition using the method by Matyka, the indirect variables of body composition were calculated. T-test for dependent variables was used in the domain of comparative statistical analysis. This research, as the training means, favoured the basic movement aspect (walking, fast walking).

Results and discussion

Heartbeat at rest decreased on average for 10.5 Bt/min. The average value of the bone mass percentage increased for 1.5% per respondent. The subcutaneous fat thickness, decreased on average for 7.2% per subject, while the muscular mass did not significantly changed, which is also indicated by the t-test (Student's t), and the loss was minimal of 1.57%. The maximal oxygen consumption (VO_{2max}) increased for 6.9 ml/min/kg BM. Such individual programmed 8-week exercising with corrected nutrition in line with individual needs, influenced the changes of body composition and improvement of cardiovascular abilities.

Conclusion

Body mass is a good indicator of adequate calorie intake and the body structure helps us establish whether the calories are taken in sufficient amounts and at regular intervals. The 8-week program of strictly individually programmed recreation led to improvement of heartbeat at rest, decrease of fat component of the body composition.

Key words: obesity, morpho-functional features, individual exercising program

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SEKCIJA 7

ATLETIKA

SESSION 7

TRACK AND FIELD

UTICAJ KONSTRUKCIJE I NAČINA NOŠENJA ŠTAFETE NA BRZINU TRČANJA

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Uvod

Izvorište štafetnog trčanja se nalazi u prenošenju poruka u antičkoj Grčkoj. Kasnije su se održavala takmičenja u prenošenju upaljenih baklji u okviru verskih svetkovina. U početnom periodu baklja je bila dužine oko jedan metar, da bi tokom evolucije takmičenja dolazilo do skraćivanja u cilju poboljšanja brzine trčanja. Nisu postojale samo promene u konstrukciji štafete, već se tokom istorije štafetnog trčanja menjao i način nošenja, kao i izmena.

Metod

U radu je korišćen metod teorijske analize, istorijski metod, kauzalni i deskriptivni metod.

Rezultati sa diskusijom

Prirodno je da su tokom evolucije štafetnog trčanja bile prisutne inovacije u pogledu konstrukcije štafete, kao i same tehnike nošenja i izmene štafete. Jedna od inovacija je i pronalazak štafete sa perifernim težištem. Predložena nova štafeta je jednostavne konstrukcije i izvedena je uz zadržavanje svih standardnih veličina propisanih domaćim i svetskim pravilima. Pretpostavka je da će se njenom primenom pri držanju na uobičajeni način u šaci postići poboljšanje u brzini trčanja štafetnih trka, a na bazi važećih atletskih pravila. Kritički osvrt na prednosti i nedostatke koji su postojali u prošlosti razmatrani su u cilju iznalaženja boljih rešenja za buduća ostvarenja još bržeg trčanja.

Zaključak

Na osnovu sinkretizma i komparativne analize konstrukcije i načina nošenja štafete iz perioda antičke Grčke pa do današnjih dana, moguće su predikcije u smislu stvaranja novih ideja koje bi doprinele poboljšanju brzine u štafetnom trčanju.

Ključne reči: štafeta, konstrukcija, način nošenja, brzina trčanja

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THE INFLUENCE OF STRUCTURAL AND WAYS OF CARRYING BATONS ON RUNNING SPEED

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Introduction

Origins of running relay race were in the transmissions of messages in ancient Greece. Later, the competition was held in transferring lighted torches in the religious ceremonies. In the initial period, the torch was about one meter in length, and during the evolution of the competition became reduced in order to improve the running speed. There were not only changes in the structure of relay baton, but throughout history of running relay, exchanges and way of carrying were changed also.

Method

The paper applies the method of theoretical analysis, historical methods, causal and descriptive method.

Results and discussion

It is natural that during the course of evolution running relay innovations were presented in terms of relay baton design, as well as in technique of carrying and exchanging the baton. One innovation was the construction of relay baton with peripheral focus. The proposed new relay baton is of a simple structure and is produced based on the sizes prescribed by domestic and international standards. The assumption is that its application in keeping the hand in the ordinary way will achieve improvement in the speed of running relay races, based on the current athletic policies. A critical review of the advantages and weaknesses that existed in the past have been considered in order to find better solutions for the future to achieve even faster running.

Conclusion

Based on syncretism and comparative analysis of structure and way of carrying the baton from the time of ancient Greece to the present days, the predictions in providing new ideas that would help improve the speed of the relay race could be implemented.

Key words: relay, baton, construction, method of carrying, running speed

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THE MODERN SPRINT MODEL

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Introduction

The modern sprint model is conceived on the basis of a biomechanical study of the world's fastest runner Usain Bolt. We analysed the kinematic structure of the double running stride in the phase of maximum sprint velocity in the zone between 80 and 90 m.

Method

The parameters of the sprint stride technique were established using the 2-D kinematic analysis and the APAS software (Ariel Dynamics Inc., San Diego, CA). The recordings were made with two synchronised Casio 300 video cameras operating at the frequency of 300 Hz. The analysed space was calibrated using the measurement frame of the following dimensions: 1 m x 1 m x 2 m. The 15-segment model of the sprinter was digitized and defined with 18 reference points.

Results and discussion

A high level of biomechanical rationality of the sprint stride was established. The stride length was 2.72 m, the frequency 4.35 Hz, the horizontal speed of the centre of gravity 11.69 m·s⁻¹, the duration of the contact phase 0.086 s, the duration of the flight phase 0.145 s and the vertical amplitude of the centre of gravity 0.049 m. The ratio between the braking phase and the acceleration phase was 37:63%. The vertical ground reaction force was 4106 kN.

Conclusion

The results of the study showed a high efficiency of the stride technique, which was manifested in the parameters of the ground reaction force, the stride length and frequency, the angle velocity of individual segments and the low level of velocity reduction in the braking phase.

Key words: sprint stride, biomechanics, technique, kinematic, Bolt

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NACIONALNA PRVENSTVA U MARATONU OD 1930. U KRALJEVINI JUGOSLAVIJI DO 2010. U REPUBLICI SRBIJI

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Uvod

Uporedo sa pojavom maratona u svetu, kao atletske discipline, počinje i organizovanje nacionalnih prvenstava. U većini država njihov nastanak je bio između dva svetska rata, kao što je to bilo i u Kraljevini Jugoslaviji. Cilj istraživanja je bio da se pronađu, prikupe, rekonstruišu i kritički analiziraju podaci o nacionalnim prvenstvima u maratonu u periodu 1930-2010. godina.

Metod

Primenjen je istorijski, kauzalni i deskriptivni metod. Prikupljeni su podaci o svim prvenstvima u maratonu i izvršena, u mogućoj meri, rekonstrukcija maratonskih trka. Posmatrano vremensko razdoblje, u zavisnosti od istorijskih događaja, podeljeno je na sledeće periode: 1. Od prvog državnog prvenstva u Kraljevini Jugoslaviji 1930. do 1939; 2. Od državnog prvenstva DFJ 1949. do 1991; 3. Od 1992. do prestanka postojanja SCG 2006; 4. Od 2006. do 2010.

Rezultati sa diskusijom

Prvi podaci u kojima se pominje državno prvenstvo u maratonu su iz 1930. Ideju je, prema pronađenim podacima, pokrenuo maratonac Dimitrije Stefanović. Tokom perioda od 1930. do početka Drugog svetskog rata u Kraljevini Jugoslaviji je održano deset prvenstava u maratonu, od kojih jedno u Beogradu. Sa tehničke strane trke su bile veoma loše organizovane. U njima je nastupao mali broj takmičara, kao što je to bilo uobičajeno i na državnim prvenstvima drugih zemalja. Tokom perioda od 1949. do 1991. maraton je uglavnom organizovan u okviru državnih prvenstava zajedno sa ostalim disciplinama, a nakon toga kao deo masovnih maratona.

Zaključak

Analiza kvaliteta i kvantiteta državnih prvenstava u maratonu pokazala je postojanje velike raznolikosti. Ovo takmičenje još uvek egzistira najviše postojanjem naših masovnih maratona. Ostvarenja su na nižem nivou, jer je manja zainteresovanost i atletičara i atletičarki Srbije da nastupaju na državnim prvenstvima. Na rezultate i broj učesnika državnih prvenstava u maratonu uticali su: politika, način organizovanja maratonskih trka, vreme održavanja značajnih takmičenja, a u kasnijem periodu novčane nagrade koje su isplaćivali organizatori masovnih maratona.

Ključne reči: atletika, maraton, nacionalna prvenstva

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NATIONAL CHAMPIONSHIPS IN MARATHON FROM 1930. IN KINGDOM OF YUGOSLAVIA TO 2010. IN REPUBLIC OF SERBIA

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Introduction

Concurrently with the worldwide appearance of marathon, as discipline in athletics, the organizing of National Championships starts. In the majority of countries, they occurred between two world wars, same applying for Kingdom of Yugoslavia. The goal of this research was to find, gather, reconstruct and do critical analysis of the data about national championships from 1930 to 2010.

Method

Historical, causal and descriptive methods were used. The data on all marathon championships were gathered and, to a feasible extent, a reconstruction of marathon races was conducted. With regard to the time frame, depending on historical events, it was divided into following periods: 1. From the 1st National Championship in Kingdom of Yugoslavia in 1930 to 1939; 2. From National Championship of DFY in 1949 to 1991; 3. From 1992 to 2006, when Serbia and Montenegro ceased to exist; 4. From 2006 to 2010.

Results and discussion

The first data where national championship had been mentioned go back to 1930. The idea, according to the found information, was initiated by marathon runner Dimitrije Stefanović. During the period from 1930 to the beginning of World War II, ten marathon championships had been held, of which one took place in Belgrade. Looking at them from a technical perspective, they were organized rather poorly. There were a meagre number of competitors, which was also common for national championships of other countries. During the period from 1949 to 1991, marathon was mainly organized on a national championship together with other disciplines, and after that, it became a part of mass marathons.

Conclusion

The analysis of quality and quantity of marathon national championships showed a great diversity. This competition still exists because of our mass marathons. Achievements are low, for athletes' interest to compete on national championships is a lot lower. The results and number of competitors on marathon national championships were affected by: politics, the way of organizing marathon races, important events' dates, and later on prize money handed out by the organizers of mass marathons.

*Key words:*athletics, marathon, national championships

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NASTANAK I RAZVOJ MARATONA ZA ŽENE U SRBIJI

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Uvod

Prošlo je osamdeset osam godina od prvih, modernih Olimpijskih igara, na kojima je održan maraton, do zvaničnog učešća žena u ovoj atletskoj disciplini. Trčanje maratona bila je isključivo muška disciplina sve do 1970. godine, kada su počele da se uključuju i žene. Slično je bilo i na tlu Srbije. Ženska atletika u Srbiji se razvijala sporije nego muška. Gotovo dvadeset godina kasnije od razvijenih atletskih zemalja se uvode u atletske programe trčanje na 10.000 m, polumaraton i maraton za žene. Cilj ovog istraživanja je bio da se pronađu, prikupe, rekonstruišu i kritički analiziraju podaci o maratonu za žene u Srbiji.

Metod

Da bi se utvrdio nastanak i razvoj maratona za žene i njegove razvojne faze primenjene su istorijska, kauzalna i deskriptivna metoda. Prethodno rečeno utvrđeno je na osnovu dostupnih naučnih istraživanja, spisa i dokumenata zvaničnih institucija i privatnih arhiva.

Rezultati sa diskusijom

Na osnovu rezultata istraživanja može se konstatovati da se za nastanak maratona u Srbiji može izdvojiti period 80-ih godina prošlog veka. Žene su prvi put zvanično na državnom prvenstvu u maratonu i hodanju nastupile 1987. godine. Trku je završilo pet takmičarki. Do 1994. godine rezultati žena u maratonu su stalno napredovali, zatim je došlo do stagnacije rezultata do 2003. godine, kada je postignut najbolji rezultat u maratonskom trčanju kod nas. Posle ovog perioda dolazi do pada u kvalitetu rezultata. Istraživanje je pokazalo da je na takmičenjima u maratonu učestvovalo malo takmičarki. Svake godine maraton u Srbiji u proseku istrči jedanaest trkačica. U posmatranom periodu samo su dve atletičarke imale vrhunske rezultate koji su bili približni evropskim i svetskim ostvarenjima.

Zaključak

Nastanak maratona za žene u Srbiji uslovljen je nastankom maratona za žene u svetu, ali je bio potreban duži vremenski period za ustanovljavanje. Na osnovu rezultata istraživanja moguće je odrediti budući razvoj ove atletske discipline, u cilju omasovljavanja i unapređenja ženskog maratonskog trčanja u Srbiji, samim tim i sporta žena.

Ključne reči: maraton, žene, Srbija

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THE ORIGINS AND DEVELOPMENT OF THE MARATHON FOR WOMEN IN SERBIA

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Introduction

It's been eighty-eight years from the first modern Olympic Games, on which were held marathon, to the official women's participation in this athletic event. Running a marathon was the only men's events until 1970, when they began to include women. Similarly, that was in Serbia. Women's athletics in Serbia has developed more slowly than men's. Almost twenty years later than the developed countries it has been introduced 10.000 m, half-marathon and marathon for women in athletic programs. The aim of this study was to identify, collect, restore and critically analyze data on the marathon for women in Serbia.

Method

To determine the origin and development of the marathon for women and their developmental stages historical, descriptive and causal methods were applied. Foregoing determined on the basis of available scientific research, papers and documents of official institutions and private archives.

Results and discussion

On the basis of these results it can be concluded that the formation of a marathon in Serbia can extract the period 80-ies. Officially, women are occurred the first state championship in the marathon and walking in 1987. The race ended five contestants. To 1994 the results of the women's marathon are constantly advancing, then there has been a stagnation of results until 2003, when achieved the best result in marathon running with us. After this period quality of results decline. The study showed small number of contestants that participated in the marathon. Each year an average the marathon runs eleven runner. During the reporting period, only two athletes had excellent results which were close to the European and international achievements.

Conclusion

The genesis of the marathon for women in Serbia is caused by the genesis of women's marathon in the world, but needed a long time to establish. On the basis of these results it is possible to determine the future development of this athletic discipline, in order to improve the spreading and development of the women's marathon run in Serbia, thus the sport of women.

Key words: marathon, women, Serbia

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NEKE KARAKTERISTIKE PSIHOLOŠKOG PROFILA ELITNIH ATLETIČARA SRBIJE

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Uvod

Rezultati velikog broja stranih i domaćih studija pokazali su da među psihološkim svojstvima sportista najveći uticaj na njihov uspeh imaju, ne toliko opšta svojstva ličnosti, koliko razvijenost i korišćenje onih psiholoških svojstava i veština koje su specifične za sport, jer ona istovremeno uvažavaju karakteristike ličnosti sportiste s jedne strane i specifične zahteve takmičarskih situacija s druge strane (interakcionistički pristup). Cilj ovog istraživanja bio je da pokaže da li se takmičarska anksioznost, sportsko samopouzdanje i nivo razvijenosti psiholoških veština prevladavanja stresa u sportu kod atletičara, mogu dovesti u vezu sa polom, starošću i takmičarskim iskustvom.

Metod

Istraživanje je izvedeno na uzorku elitnih atletičara Srbije (N=60) oba pola (m= 29; ž=31) i prosečne starosti od 20 godina koji se 10 i više godina bave različitim atletskim disciplinama. Varijable uključene u istraživanje su: nivo takmičarske anksioznosti meren testom takmičarske anksioznosti *SCAT-c* (Bačanac, 1989), nivo sportskog samopouzdanja meren *Inventarom sportskog samopouzdanja* (SCI, Vealey & Knight, 2008), *Inventar psiholoških veština prevladavanja stresnih situacija u sportu* (ACSI-28, Smith et al., 1995), pol, starost i takmičarsko iskustvo. Podaci su obrađeni korelacionom analizom, analizom varijanse i t-testom.

Rezultati sa diskusijom

Rezultati su potvrdili da atletičarke, u poređenju sa atletičarima, kao i atletičare oba pola koji se kraće bave sportom u poređenju sa iskusnijim takmičarima, karakteriše dosledno viši nivo crte takmičarske anksioznosti (pred start takmičenja pokazuju više simptoma kognitivnog i somatskog uzbuđenja) i niži nivo sportskog samopouzdanja. Atletičari muškog pola imaju razvijenije psihološke veštine prevladavanja stresa u sportu nego atletičarke ($t=2.99$, $p=0.004$), a posebno su uspešniji u savladavanju problema, trenabilniji su (pozitivnije reaguju na primedbe i kritike trenera), pokazuju više samopouzdanja u situacijama postignuća i na takmičenja izlaze rasterećeniji, sa manje negativnih misli, briga i strahova od neuspeha. Starost nije pokazala značajnu povezanost sa takmičarskom anksioznošću i veštinama prevladavanja stresa atletičara. Pokazalo se da sa uzrastom atletičara raste i njihovo sportsko samopouzdanje ($r=0.44$, $p<0.01$), naročito stepen uverenosti u kognitivnu efikasnost ($r=0.434$, $p<0.01$) i psihološku rezilijentnost ($r=0.417$, $p<0.01$).

Zaključak

Iz navedenih i ostalih rezultata možemo zaključiti da je takmičarsko iskustvo najvažnija determinanta sportskog samopouzdanja atletičara, dok je pol ključni faktor koji utiče na intenzitet takmičarske anksioznosti i razvijenost psiholoških veština prevladavanja stresa.

Ključne reči: takmičarska anksioznost, sportsko samopouzdanje, veštine prevladavanja stresa, atletičari

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PSYCHOLOGICAL PROFILE CHARACTERISTICS OF SERBIAN ELITE ATHLETICS

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Introduction

Numerous past studies revealed that psychological characteristics that influence athletes' success are not general personality traits, but level of development and usage of psychological characteristics and skills that are specific to sports situations, because these characteristics include personality traits of the athletes and specific demands of competitive sports situations at the same time (interactionist approach). The aim of this study is to examine the association between competitive anxiety, sports confidence, athletic coping skills and gender, age and sports experience.

Method

Sixty elite Serbian athletics (Male=29, Female=31), with an average age 20 years and an average sports experience of 10 or more years, participated in the study. The variables measured in this research were: competitive anxiety operationalized through *SCAT-c* questionnaire (1), sports self-confidence operationalized through *Sport Confidence Inventory* (SCI), athletic coping skills operationalized through *Athletic Coping Skills Inventory* (ACSI-28), gender, age and sports experience (2). Analysis of variance, t-test and correlation analysis were conducted.

Results and discussion

Results revealed that female athletics, compared to male athletics, and athletics with less sports experience, compared to athletics with more experience, have higher competitive anxiety (which means that they show more symptoms of cognitive and somatic arousal before competitive situations) and lower sports confidence. Male athletics have better developed athletic coping skills than female athletics ($t=2.99$, $p=0.004$), particularly: they better cope with adversity, have more developed coachability (they react positively to coaches' critics and suggestions), have more confidence, achievement motivation and less negative thoughts, worries and fears of failure. Results showed that there is no correlation between age of athletics and both competitive anxiety and athletic coping skills. There is a positive correlation between age and sports confidence, particularly level of confidence in cognitive efficacy ($r=0.434$, $p<0.01$) and psychological resilience ($r=0.417$, $p<0.01$).

Conclusion

We can conclude, based on the results of this study, that the sports experience is the most important factor of self-confidence of athletics and that gender has the most important influence on intensity of competitive anxiety and level of development of athletic coping skills.

Key words: athletics, competitive anxiety, sports confidence, athletic coping skills

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STRESS AND SATISFACTION WITH LIFE AMONG SLOVENE RECREATIONAL RUNNERS

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Introduction

While the physiological benefits of physical activity are well established, less is known about the psychological or emotional benefits, particularly among adults who participate in recreational running. Recreational running is considered as one of most popular sport activities in Slovenia. Therefore the aim of the study was to investigate the influence between incidences of running activity on mental health, which was defined as psychological signs of stress. We also tried to find an answer to the question of the differences in mental health between runners and representative sample of Slovenes.

Method

Sample of subjects consisted of 1324 adult recreational runners (37.8±10.9 yrs.) and 856 adult Slovenes, representing general population (39±13.73 yrs.). Data were collected with a survey. Frequency of recreational running was measured by asking runners how many times per week they run and what the weekly running distance is. To determine mental health the respondents marked how often the 9 signs of stress appeared within a last month. Scores on the first component of stress were computed with principal component analysis using Andersen-Rubin method. The effects of sport activity on stress were evaluated with general linear models. Comparison between recreational runners and representative sample in stress signs were computed using t-test.

Results and discussion

The results indicated that the runners run 3.4 (SD=1.2) times per week, with average weekly running distance of 35.3 km. Influence of running activity on stress was found. In the linear model (adj. $R^2=0.048$, $p<0.001$) expected stress level decreases by 0.085 z-value for each additional session of running training per week. In the second model ($n=680$, adj. $R^2=0.052$, $p<0.001$) expected stress level decreases by 0.005 by every kilometer run within a week. In both models older athletes and males have lower expected values of stress, as though gender is not significant predictor in the second model. Findings also indicated that respondents most often confront anger and exhaustion. Runners experience at least once a week anger (Me=1.86; IQR = 1.09) and exhaustion (Me=1.81; IQR = 1.11), while representative sample most often deal with exhaustion (Me=2.01; IQR= 0.86). Most of stress signs appear statistically significantly more often with recreational runners than representative sample of Slovenes; only exhaustion seems to be confronted less often with runners.

Conclusion

When analysing only runners it could be concluded that more sportingly active individuals experience the signs of stress less often. When comparing incidence of stress signs between runners and representative sample it shows that runners confront most of stress signs more often, but they seem to be less exhausted.

Key words: recreational running, stress, Slovenes

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DIFFERENCES BETWEEN THE ELITE AND SUB-ELITE SPINTERS IN KINEMATIC AND DYNAMIC DETERMINANTS OF VERTICAL JUMPS

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Introduction

Vertical jumps are important training tools as well as a diagnostic method for examining the take-off strength of lower extremities in sprinters. The aim of the study was to examine differences in an area of take-off strength between the elite and sub-elite sprinters. Countermovement jump and 45-centimetre drop jump tests were used as criteria of take-off strength.

Method

Sample of measured subjects included 12 best Slovenian sprinters (age 22.4 ± 3.4 years; average of best results in 100-metre sprint was 10.82 ± 0.25 s). They divided in two sub-groups with the official 100-metre sprint running result being used as a grouping criterion. Vertical jumps were measured in a biomechanical laboratory of the Polyclinic for physical medicine and rehabilitation »Peharec« in Pula. First, athletes performed countermovement jump and then 45-cm drop jump. Each jump was executed five times. In countermovement jumps measured subjects started from an upright standing position followed by a crouch (90° knee angle) and immediate vertical take-off. Drop jumps were executed from a 45 centimetre high bench, landing was performed on a surface – tensiometric plate – followed by an immediate vertical take-off. A system of 9 CCD cameras (BTS Smart-D) with a 200 Hz frequency of 200 and resolution 768 x 576 pixels was used in order to carry out a 3-D kinematic analysis of vertical jumps. A programme BTS Suite was used to analyse kinematic parameters. Dynamic variables of vertical jumps were examined with the use of two separate force platforms (Kistler, Switzerland) at a sampling rate of 800 Hz. Analysis included the following dynamic variables: maximal ground reaction force, impulse of force, impulse of force in eccentric and concentric phases.

Results and discussion

Statistically significant differences ($p < 0.05$) between the sprinters of both groups were revealed in six kinematic and dynamic parameters. In countermovement jump, the differences between the groups of sprinters were revealed in parameters height of the jump (elite 65.39 ± 6.03 cm, sub-elite 57.55 ± 2.03 cm), vertical velocity of body centre of gravity (elite 3.23 ± 0.15 m/s, sub-elite 2.94 ± 0.09 m/s), and the impulse of force in the concentric phase of the jump. In drop jump, elite and sub-elite sprinters differentiated in the realisation of movement velocity in the eccentric (elite 3.05 ± 0.1 m/s, sub-elite 2.81 ± 0.07 m/s) and concentric phases (elite 3.18 ± 0.15 m/s, sub-elite 2.87 ± 0.24 m/s). Elite sprinters better utilise the stretch reflex, which allows them to more efficiently transfer elastic energy from first into second phase of take-off action.

Conclusion

Vertical and drop jumps are important training tools in plyometric training of sprinters. They can be used to improve functioning of eccentric-concentric muscular work in lower extremities. Furthermore, these jumps are reliable and objective measuring instrument for diagnosing and planning of training process of athletes in the area of strength.

Key words: sprint, countermovement jump, drop jump, kinematic, dynamic parameters

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POVEZANOST VITALNOG KAPACITETA PLUĆA SA REZULTATIMA TRČANJA 100 M, 400 M I 800 M

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Uvod

U ovom radu je analizirana vrijednost respiratornog sistema i njena povezanost sa rezultatima trčanja na 100m, 400m i 800m. Problem istraživanja u ovom radu je povezanost rezultata navedenih atletskih disciplina sa vrijednostima volumena kiseonika izdahnutog u prvoj sekundi, vrijednosti maksimalnog forsiranog kapaciteta pluća i maksimalne brzine izdaha. Cilj istraživanja je, utvrditi postojanja povezanosti rezultata koje su ispitanici postigli u više atletskih disciplina sa vrijednostima funkcija respiratornog sistema.

Metod

Uzorak ispitanika čini 40 studenta muškog pola, koji redovno pohađaju nastavu na Fakultetu fizičkog vaspitanja i sporta u Banjoj Luci. Prediktorske varijable u ovom istraživanju su: rezultati trčanja na 100m, 400m, 800m, a kriterijske varijable su: vrijednost volumena kiseonika izdahnut u prvoj sekundi, vrijednost maksimalnog forsiranog kapaciteta pluća, maksimalna brzina izdaha. Mjerenje vremena na 100m, 400, i 800m je vršeno ručno. Funkcije respiratornog sistema su mjerene spirometrom MicroLab 3500-NEW. Korištene su metode teorijske analize i deskriptivna metoda. Rezultati su obrađeni postupcima deskriptivne i komparativne statistike. Statistička obrada podataka izvršena je pomoću statističkog programa SPSS (17.0).

Rezultati sa diskusijom

Korelaciona analiza je pokazala da postoji statistički značajna povezanost između kriterijskih i prediktorskih varijabli. Koeficijent korelacije (r) između rezultata trčanja 100m sa vrijednostima pojedinih funkcija respiratornog sistema iznosi -0.72, -0.67 i -0.67, kod rezultata trčanja na 400m iznosi -0.60, -0.55 i -0.60, dok kod rezultata trčanja na 800m iznosi -0.61, -0.55 i -0.66. Regresiona analiza je pokazala statistički značajno predviđanje rezultata prediktorskih varijabli na osnovu vrijednosti kriterijskih varijabli. Ukoliko se povećaju pojedine funkcionalne sposobnosti respiratornog sistema rezultati trčanja na 100m će se smanjiti za 1.22, 0.97 ili 0.01 sekundu, na 400m 7.27, 5.62 ili 0.06 sekundi i rezultati na 800m 16.96, 13.01 ili 0.15 sekundi.

Zaključak

Dobijeni rezultati doveli su do zaključka da su funkcije respiratornog sistema značajno povezane sa rezultatima trčanja na 100m, 400m i 800m, te da se na osnovu vrijednosti funkcija respiratornog sistema mogu statistički značajno predvidjeti rezultati trčanja na spomenute tri dionice. S tim u vezi, trenazni proces atletičara koji trče na ovim dionicama treba u svom planu i programu da predvidi razvijanje funkcija respiratornog sistema, jer one značajno mogu uticati na ostvarivanje boljih rezultata na tim disciplinama.

Ključne reči: vitalni kapacitet pluća, trčanje, predviđanje

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CONNECTION BETWEEN LUNGS VITAL CAPACITY AND RESULTS OF RUNNING ON 100 M, 400 M AND 800 M

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Introduction

In this study is analyzed the value of the respiratory system and its correlation with results of running on 100m, 400m and 800m. Researched issue in this study is correlation between mentioned athletic discipline results with values of the volume of oxygen exhaled in the first second, the maximum value of forced lung capacity and the maximum speed of expiration. The goal of this research is to determine the existence of connected results, which examined subjects achieved in more athletic disciplines with values of respiratory system functions. Following hypotheses are assumed: H1 – it is expected to have statistically significant interconnectivity between running results with respiratory system functions; and H2 - it is expected to have statistically significantly prediction of results of running on 100m, 400m and 800m based on oxygen exhaled volume values in first second, the value of the maximum capacity of the forced lungs and maximum speed of expiration.

Method

The sample consisted of 40 male students. Predictor variables in this study are: results of running on 100m, 400m, 800m, and criterion variables are: the volume value of oxygen exhaled in the first second, the value of the maximum forced lung capacity, maximum speed of expiration. Measuring of time on 100m, 400 and 800m was done manually. Functions of the respiratory system were measured by spirometer Microlab 3500-NEW. The methods of theoretical analysis and descriptive methods were used. The results were analyzed using descriptive and comparative statistics. Statistical analysis of data was performed by using SPSS statistical software (17.0).

Results and discussion

Comparative statistics showed a statistically significant correlation between the criterion and predictor variables. This confirms the value of significance, which in all cases is 0.00. It was also concluded that statistically significant can be predicted results of predictor variables based on the values of criterion variables. Also, the value of significance in this case is 0.00.

Conclusion

The research and analysis of the results led to the conclusion that the function of the respiratory system is significantly associated with the results of running on 100m, 400m and 800m, and that based on values of respiratory functions can significantly predicted result of running on mentioned three stocks. In this regard, the training process of athletes who run in these stocks should be in your plan and program to predict the development of respiratory function, because they can significantly affect the achievement of better results in these disciplines.

Key words: a vital lung capacity, running, prediction

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MONITORING THE INFLUENCE OF KINEMATICS PARAMETERS IN THE SAMPLE OF 110 METERS HURDLES

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Introduction

This paper aims to address the level of technical training try-out for the 110 meters hurdles due to lack of modern methodologies in training intervention, by objective detection and correction of technical errors during hurdle crossing by using video analysis software.

Method

The use of the pedagogical observation method has revealed specific aspects of the drive ability and runner leap over the hurdles, in terms of technique and kinematics. This method allowed us to compare case studies (S2 and S3) with the reference model (S1) and the model in the References and therefore the application of these variables obtained during the training, their responses to requests for video viewing. Video analysis method shows the possibility of processing of video based on video analysis software, which aims to capture and observe motor movement.

Results and discussion

After recording video size parameters, values of kinematics parameters were recorded individually during the course of the experimental research. Thus, a procedure for monitoring those parameters was developed in order to determine technical aspects. Keeping the track of individual data sheets permits the observation of the positive and negative aspects and the correction of objective individual technical errors. Customization of the monitoring system for sporting performance contributes to objectivity in practice through the use of various video tools (1). Due to the importance of the sporting technique in the 110 meters hurdles in achieving an efficient way without a substantial loss of speed, implementing a monitoring project for this connection is perfectly justified (2).

Conclusion

The evaluation and monitoring of technical preparation are complex processes and involve the objectification of the driving ability structure technologies, at the kinematics parameters level, for the purpose of conducting scientific technical training and being able to correct individual errors in order to increase performance.

Key words: monitoring, technique, kinematics

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RESEARCH ON THE BULGARIAN U14 TRACK AND FIELD STATUS AND TENDENCY OF DEVELOPMENT

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Introduction

Our study presents the current situation of the Bulgarian U14 track and field as objectively state of Bulgarian track and field future and politics of its development. We show in details Bulgarian Athletics Federation (BAF) politics for the age group U14 and the official competitions organized by BAF. Also we showed the effect of the U14 combined competition which includes outdoor National Championships (including 60 meters, 60 meters hurdles, long jump, and 800 meters or shot put for the boys and for the girls the difference is 600 meters or shot put) and indoor (including 60 meters, long jump, 800 meters or shot put for the boys and for the girls the difference is 600 meters or shot put).

Method

For achieving the aim of the following study we analyzed Bulgarian National Championships both outdoor and indoor (from 2009 to 2012 – due to the change in the disciplines for the athletes U14 made in 2009 by BAF). Also we have conducted discussion with several experienced track and field coaches. Object of our research are boys and girls aged U14 card – indexed in BAF and participated in National Championships (NC) in this age group. We also used certain statistical methods and computer programs for accomplishing the statistical analysis – SPSS 19.0 and Microsoft Office 2010.

Results and discussion

We used this age group due to our understanding that it is the "foundation of the pyramid" and from there we can forecast the future of the Bulgarian track and field. We noticed also that after the change in the disciplines after 2009 the children taking part in the NC raised. Also the combined events give better opportunity of the young athletes to show their talent and make easier for coaches to develop their talents. We think that it will be positive to include the discipline of 60 m hurdles indoors and high jump both outdoor and indoor. This will help develop coordination, speed and strength abilities of grow up athletes.

Conclusion

With the including of various disciplines we are gaining better motivation for practicing track and field among children of different social groups by organizing and conducting different athletic forums considering children capabilities, interest and needs. Also the expanding and creating motivation among young athletes for systematic training and also gaining competition experience will help the achievement of higher results.

Key words: U14, track and field, athletics, trend

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RAZLIKE IZMEĐU DJEVOJČICA I DJEČAKA U KINEMATIČKIM PARAMETRIMA SPRINTERSKOG TRČANJA

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Uvod

Sprint je ciklička motorička aktivnost koja se sastoji od ponavljajućih trkaćih koraka, a horizontalna brzina sprinterskog koraka produkt je duljine i frekvencije koraka. Cilj ovog istraživanja je utvrditi razlike između djevojčica i dječaka mlađe školske dobi u kinematičkim parametrima sprinterskog trčanja koji određuju brzinu trčanja i vremenu trčanja na 50 m.

Metod

Uzorak ispitanika čini 150 učenika i učenica prvog i drugog razreda jedne osnovne škole u Puli. Od ukupnog broja, 70 je dječaka i 80 djevojčica. Prosječna je dob dječaka 8.12 ± 0.63 godina, visina tijela je 133.56 ± 7.66 cm, a masa tijela 31.42 ± 8.05 kg. Prosječna je dob djevojčica 8.08 ± 0.61 godina, visina tijela je 132.05 ± 6.44 cm, a masa tijela je 29.91 ± 7.25 kg. Uzorak varijabli čine kinematički parametri sprinterskog trčanja u fazi maksimalne brzine (frekvencija koraka, duljina koraka, trajanje kontakta i trajanje leta) i vrijeme trčanja na 50 m. Kinematički parametri sprinterskog trčanja u fazi maksimalne brzine prikupljeni su primjenom tehnologije Optojump (Microgate, Italija), dok je vrijeme trčanja na 50 m dobiveno primjenom fotočelija. Izračunati su osnovni deskriptivni parametri, a za utvrđivanje razlika između dječaka i djevojčica u kinematičkim parametrima sprinterskog trčanja korištena je univarijatna analiza varijance i diskriminacijska analiza.

Rezultati sa diskusijom

Duljina koraka varijabla je u kojoj nema statistički značajnih razlika između dječaka i djevojčica, iako djevojčice postižu prosječno više vrijednosti. Trajanje kontakta dulje je kod djevojčica za 6.6% u odnosu na dječake, dok je trajanje leta kod djevojčica dulje za 10%. Djevojčice u prosjeku imaju i nižu frekvenciju koraka za 7.2% u odnosu na dječake. Dječaci postižu bolje vrijednosti u svim varijablama vremena trčanja na 50 m, a prosječno vrijeme trčanja na dionici od 50 m kod dječaka je brže za 4.8% u odnosu na djevojčice.

Zaključak

Dobiveni rezultati potvrđuju dosadašnje spoznaje dobivene na ispitanicima starije dobi prema kojima dječaci mlađe školske dobi postižu bolje vrijeme u trčanju na 50 m, imaju veću frekvenciju koraka, kraće trajanje faze leta i kraće trajanje kontakta s podlogom, dok djevojčice imaju veću duljinu koraka u sprinterskom trčanju.

Cljučne riječi: sprintersko trčanje, kinematički parametri, djeca

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DIFFERENCES BETWEEN GIRLS AND BOYS IN KINEMATIC PARAMETERS OF SPRINTER'S RUNNING

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Introduction

Sprinting is a cyclic motor activity which consists of repetitive running steps and the horizontal speed of the sprinter's step is a product of the length and frequency of the step. The main aim of this research is to determine differences between girls and boys of a younger school age in kinematic parameters of running at maximum speed (the frequency of steps, the length of steps, the duration of the contact and the flight) and the results in 50 metre running.

Method

The sample of examinees consisted of 150 male and female pupils from the first and second form of a primary school in Pula (70 male and 80 female pupils). The average male pupils' age was 8.12 ± 0.63 , their height was 133.56 ± 7.66 centimetres, and their body mass was 31.42 ± 8.05 kilogrammes. The average female pupils' age was 8.08 ± 0.61 , their height was 132.05 ± 6.44 centimetres, and their body mass was 29.91 ± 7.25 kilogrammes. The sample of variables consisted of variables used for determining the kinematic parameters of the sprinter's running in the phase of the maximum speed (the frequency of steps, the length of steps, the duration of the contact and the flight) and the 50-metre running time. The kinematic parameters of the sprinter's running in the phase of maximum speed have been collected by applying the Opto jump technology (Microgate, Italy) which was set on the segment between the 15th and the 35th metre, on a length of 20 metres. The 50-metre running time has been measured by the system for electronic measuring.

The basic descriptive parameters have been worked out, while the differences between girls and boys have been analyzed by the univariant analysis of variance and discriminant analysis.

Results and discussion

The length of steps is a variable for which there are not statistically significant differences between boys and girls although girls achieve averagely higher values. The duration of the contact is longer for girls for 6.6 percent compared to boys, while the length of flight is longer for 10 percent. On average, girls have a 7.2 percent lower frequency of steps when compared to boys. Boys achieve higher values for the 50 metre running time variable, while boy's average running time is 4.8 percent faster compared to girls.

Conclusion

The obtained results confirm former knowledge according to which boys achieved better results in 50-metre running time, a higher frequency of steps, a shorter duration of the flight phase and a shorter contact of the foot with the ground, while girls achieve averagely higher values of the length of steps.

Key words: sprinter's running, kinematic parameters, children

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UPOREDNA ANALIZA TEHNIKE VRHUNSKIH BACAČA KOPLJA

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Uvod

Bacanje koplja je atletska disciplina u kojoj bacač nastoji da kombinovanim pravolinijskim i lučnim kretanjem tela saopšti koplju najveću moguću brzinu u trenutku izbačaja da bi postigao što duži hitac. Tokom evolucije ove discipline koristili su se različiti načini i vrste bacanja koplja koji su imali uticaja na domet. Biomehanička analiza tehnike vrhunskih bacača koplja, odnosno njenih segmenata omogućuje da se odrede najznačajniji faktori u postizanju rezultata. Cilj ovog rada je bio da se utvrdi koji biomehanički parametri u fazi izbačaja koplja najviše utiču na dužinu hica.

Metod

U radu su korišćene teorijska analiza, deskriptivna i kauzalna metoda. Na osnovu biomehaničkih analiza sedam atletičara sa Svetskog prvenstva u Sevilji 1999. godine i pet atletičara sa Otvorenog prvenstva Katara 2009. godine, pokušano je da se odrede najznačajniji pokazatelji tehnike vrhunskih bacača koplja. U posmatranim istraživanjima za analizu tehnike korišćena je 3D fotogrametrička analiza.

Rezultati sa diskusijom

Može se zaključiti da svaki bacač poseduje individualni model bacanja koji je povezan sa onim što se može nazvati “filter efikasnosti”. Ovi “filteri” predstavljaju minimalne zahteve potrebne za kvalitetnije bacanje koplja i utiču na poziciju kinetičkog lanca kopljaša u finalnoj fazi izbačaja i međusobnu koordinaciju delova tela pri bacanju. Najvažniji trenuci koji su se izdvojili u fazi izbačaja su: trenutak ostvarivanja kontakta zadnje stajne noge (noga podrške) sa podlogom, trenutak kada prednja stajna noga ostvaruje kontakt sa podlogom (dvopotporni položaj) i trenutak izbačaja. Među vrhunskim bacačima koplja brzina izbačaja je najbolji parameter koji predviđa daljinu hica. Ugao izbačaja ima značajnu vezu sa daljinom bacanja, ali u manjoj meri nego brzina izbačaja, dok napadni ugao nema veliki uticaj na daljinu bacanja.

Zaključak

Na osnovu rezultata istraživanja dobijeni su podaci koji su bitni za analiziranje i korigovanje tehnike bacanja koplja kod vrhunskih bacača. Dobijeni rezultati ukazuju na to da je za potrebe ostvarivanja vrhunskih rezultata u bacanju koplja, kao i u drugim bacačkim disciplinama neophodno primenjivanje biomehaničkih procedura tokom trenažnih i takmičarskih aktivnosti.

Ključne reči: bacanje koplja, biomehanička analiza, faza izbačaja

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COMPARATIVE ANALYSIS OF THE TECHNIQUES OF TOP JAVELIN THROWERS

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Introduction

Javelin is an athletic discipline in which the thrower is trying to combined rectilinear and arched body movements convey javelin the greatest possible speed at the time of casting to achieve a long shot. During the evolution of the discipline used by the different modes and types of throwing spears that have had an impact on the range. Biomechanical analysis techniques top javelin throwers or its segments makes it possible to identify the most important factors in achieving results. The aim of this study was to determine which biomechanical parameters in the ejection phase spears greatest impact on the length of the shot.

Method

In this paper the theoretical analysis, descriptive and causal methods were applied. Based on biomechanical analysis of seven athletes on the World Championships in Seville 1999 and five athletes on the Qatar Open Championship 2009, an attempt was made to determine the most important indicators of top javelin throwers techniques. In observed researches 3D analysis is used to analyze the techniques.

Results and discussion

It can be concluded that each thrower has individual model of throwing that is associated with what might be called “filter efficiency.” These “filters” are the minimum requirements necessary for a better throwing javelin and affect the position of the kinetic chain in the final stage of throwing and coordination of body parts. The most important moments that have stood out in the ejection phase: the moment of contact the last landing leg (foot supports) with the ground, a moment when the front stein foot makes contact with the ground (doublesupport position) and ejection time. Among the top javelin thrower’s ejection velocity parameter that provides the best distance shots. Ejection angle has a significant relationship with the throwing distance, but to a lesser extent than the ejection speed, and angle of attack does not have a large impact on distance throws.

Conclusion

Based on the results of the study the obtained data were important for the analysis and correction techniques of throwing javelin in elite throwers. The results indicate that for the purpose of achieving excellence in javelin throwing, as well as other disciplines, necessary application of biomechanical procedures in training and competitive activities.

Key words: Javelin, biomechanical analysis, ejection phase

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2. Viitasalo, J. (2003). *Biomechanics in javelin throwing with special reference to feedback for coaching*. Jyväskylä, Finland: KIHU Research Institute for Olympic Sports.

THE COMPLEX RELATIONSHIP BETWEEN THE SPECIFIC MUSCULAR STRENGTH AND THE INDIVIDUAL TECHNIQUE OF CLEARING THE BAR DURING THE HIGH-JUMP

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Introduction

The study originated from the concept that preparation for high jump event can be improved by possessing a correct and economical technique, based on analytic training, on study of the movement calculated with the help of the digital computer. The analysis aimed at highlighting the interaction between the two moments, impulse-take off, focused on specific muscular strength and air phase. The “issues” encountered in trainings and competitions, regarding the technical deficiencies caused by forces incorrectly applied during the performance, can be solved by applying modern technologies, which help analyse and adjust the effort of the high-jumpers according to physiological reactions. The measurements are significant in order to establish an optimum training process and by default to ensure results during competitions by eliminating incorrect moves new reflexes are created due to technique corrections.

Method

The physiological research of the maximum power based on the speed-force condition, on the Miron Georgescu platform (modified by Pierre de Hillerin), the measurement of biometric parameters with the Kistler platform, video recording techniques with a high-speed camera, “Trouble shooter” equipped with TFT color display and a scanning rate of 1000 frames/sec.

Results and discussion

The cinematic research recorded the following results: frame by frame image processing, frame selection from a reference point to another, “frame to frame” time render processing, thus being obtained the best execution time. The study of forces recorded on Georgescu platform and Kistler platform had in view: the initial average unitary force, the average air height, the interval of contact with the ground, length of time in the air, the pressure on the contact surface, projection angle and impulse force.

Conclusion

Based on the research, a motor program suitable to high-jumpers is presented, focused on specific physical training with the purpose of an “integrating training of technique”.

Key words: high-jump, cinematic analyse, muscular strength, technique

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DIFFERENCES BETWEEN RUNNING SPEED IN POLE VAULTING AMONG TOP POLE VAULTERS AND ROMANIAN NATIONAL TOP VAULTERS

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Introduction

Pole vault jumping consists of passing above the bar placed as high as possible, accomplishing the best synthesis between grabbing a lever which has to be brought to a vertical position and its usage in order to obtain the best record. The difference between top pole vaulters athletes and Romanian top vaulter athletes is that the results are considerably inferior and one of the main reason for this situation is that the speed running in the last part of the approach has lower values.

Method

The data on international level were measured with special equipment (optical lenses) and taken from certain research articles that are in connection with the theme studied by me and which I have mentioned in the bibliography. The data of national pole vaulting athletes in 2012 were measured with Micro Time Racer2, based on photocell, and we determined the running speed of the last part of the approach. These data were taken during the 2012 indoor National Championship.

Results and discussion

We observed that the difference of running speed in the last 15m of the approach was significantly lower in the Romanian top vaulters athletes than the running speed of the world top pole vaulters.

Conclusion

We considered that this is the main problem for the poor results obtained on national level of the pole vaulters in Romania. Of course the low speed on the approach combined with poor acceleration on the last steps have influence of highness of the pole grip and also of the amplitude and ethnicity of the jump.

Key words: polo vault, speed running, amplitude, technicity

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REALNIJE MERENJE REZULTATA U SKOKU U DALJ I TROSKOKU

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Uvod

Atletika je jedan od najstarijih, najkompleksnijih i najneizvesnijih, ... „kraljica sportova“. Sve veći su napori da se stvori vrhunski atletičar i najbolji rezultat. Jedna od karika u velikom „lancu“, od početka bavljenja atletikom, do rekordnog skoka je i objektivno suđenje. Ono se postiže nepristrasnim suđenjem, tumačenjem Atletskih pravila, koja su podložna promenama, ali objektivno prevedeno u praksi, aktuelna pravila nisu uvek na strani takmičara. Cilj rada je ukazivanje na činjenice da izmereni rezultati prema važećim Pravilima za horizontalne skokove (skoku udalj i troskoku), nisu identični realno postignutom ispravnom skoku na oficijelnom takmičenju.

Metod

U radu je izvršena analiza aktuelnih Atletskih pravila i Tehničkih uputstava za najznačajnija takmičenja, praćenje i analiza snimaka izvedenih skokova najboljih atletičara skakača. Na osnovu empirijskog metoda, predloženo je tehničko rešenje za precizno merenje skokova.

Rezultati sa diskusijom

Prema postojećim Pravilima, ispravni pokušaji u horizontalnim skokovima, mere se od najbliže zabeleženog traga u smeru ka odskočištu (nulta tačka), pa do odrazne linije, gde glavni sudija očitava postignuti rezultat. Na osnovu rezultata analize došlo se do zaključka da je potrebno realno merenje postignutog rezultata, koje ni u jednom momentu nije na štetu skakača i to od mesta odraza (na osnovu jasnog otiska na odraznoj dasci), a ne od predviđene linije odraza, pa do najbliže zabeleženog traga ka odraznoj liniji u doskočištu, kako je prema važećim Pravilima. Ovo podrazumeva dve specijalne pikir igle i lasersko merenje, na velikim takmičenjima, ili specijalno konstruisan merni uređaj na odraznoj dasci, kojim bi se prostim pomeranjem naprave postavljala granična oznaka za precizno merenje mernom trakom.

Zaključak

Na osnovu analize aktuelnih atletskih pravila, Tehničkih uputstava, snimaka sa najvećih takmičenja i ličnog višedecenijskog sudijskog iskustva može se zaključiti da su takmičari u horizontalnim skokovima oštećeni za većinu svojih najboljih rezultata, jer im se u postignutu daljinu skoka nije merila razlika od mesta odraza do odrazne linije. Uvođenjem savremenih mernih uređaja na bazi lasera, sa preciznim markiranjem mesta odraza i doskoka ovaj nedostatak bi se lako prevazišao i samim tim odgovornima dali argumenti za izmenu Pravila za atletska takmičenja.

Ključne reči: atletska pravila, skok udalj, troskok, merenje

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A MORE REALISTIC MEASURE RESULTS IN THE LONG JUMP AND TRIPLE JUMP

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Introduction

Athletics is one of the oldest, most complex and uncertain, ... "Queen of Sports". The increasing efforts to create a superb athlete and best score. One of the links in a "chain", from the start of business in athletics, a record jump in a fair trial. This is achieved impartial trial, athletic interpretation of rules, which are subject to change, but objectively translated into practice, the current rules are not always on the side of competitors. The essence of the paper is to emphasize the fact that the measured results follow the rules for horizontal jumps (long jump and triple jump), are not identical realistically achieved official proper jump on the competition.

Method

An analysis of current athletic policies and technical instructions for the most important competition, monitoring and analysis of images derived rebounds best athletes jumping. Based on empirical methods, the proposed technical solution for precise jumps.

Results and discussion

Under the existing rules, attempts to correct the horizontal jumps, measured from the nearest recorded trace in the direction towards the take-off (zero point) to the reflex line, where the chief judge read the result achieved. The point of this paper is the real measurement of achieved results, but at no time in jumping and damage to places of reflection (on the basis of a clear imprint on takeoff board), and not a reflection of the predicted lines, to the Rules of the trail to the nearest recorded takeoff line in landing pit. This includes two special pikir needles and laser measurement at major competitions or specially designed measuring device takeoff board, which would make moving simple posed boundary marks for precise measuring tape.

Conclusion

Based on the analysis of current athletic rules, technical instructions, clips from the biggest competition of decades of judicial and personal experience it can be concluded that the competitors in the horizontal jumps injured for a most its best results since they achieved in the jump distance is not a measure of the difference of to the reflex mirror line. The introduction of modern technology, modern measuring devices based on laser marking with precise reflection of this lack of carries and could be easily overcome, and therefore responsible for changing the arguments given rules athletics.

Key words: athletic rules, long jump, triple jump, measuring

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ФАКУЛТЕТ СПОРТА И
ФИЗИЧКОГ ВАСПИТАЊА
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Наставно-научно веће Факултета на 15. седници одржаној 12. јула 2012. године, а у складу са чл. 28, 29. и 30. Статута Факултета, донело је

О Д Л У К У

1. Међународни научни скуп поводом Дана Факултета 11. и 12. 2012. године одржаће се под називом: "Ефекти примене физичке активности на антрополошки статус деце, омладине и одраслих".

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Одлуку доставити: Декану, Продеканима, Секретару, Свим члановима Научног и организационог одбора и Архиви.



ДЕКАН ФАКУЛТЕТА

Академик Ђорђе Стефановић



Република Србија

Министарство за науку и технолошки развој

Конкурс за предлагање пројеката у Програму суфинансирања интегралних и интердисциплинарних истраживања за период 2011 - 2014.

ПРОГРАМ	<i>Интегрална и интердисциплинарна истраживања</i>
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ОБЛАСТ	<i>Унапређење доношења државних одлука и афирмација националног идентитета</i>
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Назив пројекта	<i>Ефекти примењене физичке активности на локомоторни, метаболички, психо-социјални и васпитни статус популације Р Србије</i>
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Евиденциони број	<i>47015</i>
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Београд, јул 2010. године

Saglasnost Etičke komisije Fakulteta sporta i fizičkog vaspitanja Univerziteta u Beogradu za realizaciju projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije R Srbije“ (br. 47015)

Na osnovu uvida u plan projekta „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije R Srbije“ (br. 47015, rukovodilac doc. dr Milivoj Dopsaj), a koji je odobren od Ministarstva za nauku i tehnološki razvoj R Srbije u okviru ciklusa nacionalnih naučnih projekata za period 2011-2014. godine, Etička komisija Fakulteta sporta i fizičkog vaspitanja Univerziteta u Beogradu iznosi mišljenje da se, kako u koncipiranju tako i u planiranju realizacije istraživanja i primene dobijenih rezultata, polazilo od principa koji su u skladu sa etičkim standardima, čime se obezbeđuje zaštita ispitanika od mogućih povreda njihove psiho-socijalne i fizičke dobrobiti.

U skladu sa iznetim mišljenjem Etička komisija Fakulteta sporta i fizičkog vaspitanja Univerziteta u Beogradu daje saglasnost za realizaciju istraživanja planiranih projektom „Efekti primenjene fizičke aktivnosti na lokomotorni, metabolički, psiho-socijalni i vaspitni status populacije R Srbije“ (br. 47015, rukovodilac doc. dr Milivoj Dopsaj) a koji je odobren od Ministarstva za nauku i tehnološki razvoj R Srbije u okviru ciklusa nacionalnih naučnih projekata za period 2011-2014. godine.



Za Etičku komisiju

red. prof. dr Đušan Ugarković

van. prof. dr Vladimir Koprivica

РЕПУБЛИКА СРБИЈА
УНИВЕРЗИТЕТ БЕОГРАДУ
ФАКУЛТЕТ СПОРТА И ФИЗИЧКОГ ВАСПИТАЊА
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UNIVERSITY OF BELGRADE
FACULTY OF SPORT AND PHYSICAL EDUCATION

APPROVAL OF THE ETHICS COMMITTEE OF THE FACULTY OF SPORT AND PHYSICAL EDUCATION, UNIVERSITY OF BELGRADE FOR EXECUTION OF THE PROJECT "EFFECTS OF THE APPLIED PHYSICAL ACTIVITY ON LOCOMOTOR, METABOLIC, PSYCHO-SOCIAL AND EDUCATIONAL STATUS OF THE POPULATION OF THE REPUBLIC OF SERBIA" (No. 47015)

Based on the inspection of the plan of the project "Effects of the Applied Physical Activity to Locomotor, Metabolic, Psycho-Social and Educational Status of the Population of the Republic of Serbia" (No. 47015, project leader assistant prof. Milivoj Dopsaj, PhD), approved by the Ministry of Science and technological development of the Republic of Serbia within the cycle of national scientific projects for the period from 2011 to 2014, the Ethics Committee of the Faculty of Sport and Physical Education of the University of Belgrade considers that both in research conception and execution planning as well as in the application of the obtained results, from its beginning the project has been undertaken based on the principles which comply with ethical standards, ensuring thus protection for human subjects from possible violation of their psycho-social and physical benefit.

In conformity with the aforesaid opinion, the Ethics Committee of the Faculty of Sport and Physical Education of the University of Belgrade has granted the approval for realization of the research planned by the project "Effects of the Applied Physical Activity to Locomotor, Metabolic, Psycho-Social and Educational Status of the Population of the Republic of Serbia" (No. 47015, project leader Assistant prof. Milivoj Dopsaj, PhD) which is approved by the Ministry of Science and technological development of the Republic of Serbia within the cycle of national scientific projects for the period from 2011 to 2014.

For the Ethics Committee
full prof. Dušan Ugarković, signed
associate prof. Vladimir Koprivica, signed
(Stamp)

END OF TRANSLATION

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