

NIVO SPECIFIČNE IZDRŽLJIVOSTI I TEHNIČKO-TAKTIČKE EFIKASNOSTI MLADIH FUDBALERA RAZLIČITOG STEPENA TAKMIČENJA

TOPLICA STOJANOVIĆ¹, SLOBODAN GORANOVIĆ¹, ALEKSANDAR
ŠAKANOVIĆ², DARKO STOJANOVIĆ³

¹Fakultet fizičkog vaspitanja i sporta, Banja Luka,
Republika Srpska, Bosna i Hercegovina

²Fakultet fizičkog vaspitanja i sporta, Pale, Republika Srpska,
Bosna i Hercegovina

³Fakultet sporta i fizičkog vaspitanja, Niš, Srbija

Korespondencija:

Prof. dr Toplica Stojanović
Fakultet fizičkog vaspitanja i sporta
Banja Luka, Bosna i Hercegovina
toplica.nis@gmail.com

Sažetak: Sa ciljem da se utvrdi na kom su nivou specifična izdržljivost i tehničko-taktička efikasnost mladih fudbalera različitog stepena takmičenja, i dali stepen takmičenja može da bude pokazatelj razlike nivoa ovih sposobnosti, provedeno je istraživanje na uzorku mladih fudbalera uzrasta od 14 do 16 godina iz osam klubova, od kojih se polovina takmičila u višem, a druga u nižem stepenu takmičenja. Uzorak mjernih instrumenata je činilo 13 testova za procjenu pet faktora specifične izdržljivosti: startne izdržljivosti, izdržljivosti u održavanju plitke formacije, izdržljivosti u brzom vođenju lopte i presing izdržljivosti na loptu, kao i ocjena tehničko-taktičke efikasnosti fudbalera. Rezultati istraživanja su pokazali da su mladi fudbaleri višeg stepena takmičenja imali značajno veću tehničko-taktičku efikasnost, kao i specifičnu izdržljivost u testovima gdje je bilo zastupljeno krivolinijsko kretanje i vođenje lopte, kao i kontrola i dodavanje lopte u kretanju, ali da ta razlika nije evidentirana kod pravolinijskih kretanja i sprinteva.

Ključne riječi: razlike, specifična izdržljivost, tehničko-taktička efikasnost, mladi fudbaleri.

Uvod

Analizom fudbalske igre (strukturnom, funkcionalnom, anatomskom, biomehaničkom, motoričkom ...) dolazimo do značajnih informacija o zahtjevima sa kojima se fudbaleri suočavaju na utakmici i treningu (Krsmanović, 2014). Fudbal se ubraja u polistrukturalna, ciklična i aciklična kretanja, gdje su motoričke sposobnosti zastupljene kompleksno sa visokim nivoom maksimalne potrošnje O₂ (Castagna i sar., 2006; Ramsbottom i sar., 1988; Leger i Lambert, 1982). Intenzitet se mijenja od

THE LEVEL OF SPECIFIC ENDURANCE AND TECHNICAL AND TACTICAL EFFICIENCY OF YOUNG FOOTBALL PLAYERS OF DIFFERENT LEVEL OF COMPETITION

TOPLICA STOJANOVIĆ¹, SLOBODAN GORANOVIĆ¹, ALEKSANDAR
ŠAKANOVIĆ², DARKO STOJANOVIĆ³

¹Faculty of Physical Education and Sport, Banja Luka, Republic of
Srpska, Bosnia and Herzegovina

² Faculty of Physical Education and Sport, Pale, Republic of Srpska,
Bosnia and Herzegovina

³Faculty of Physical Education and Sport, Niš, Serbia

Correspondence:

Prof. dr Toplica Stojanović
Faculty of Physical Education and Sport
Banja Luka, Bosnia and Herzegovina
toplica.nis@gmail.com

Summary: In order to determine at which level is the specific performance and technical and tactical efficiency of young players of different level of competition, and whether the level of competition can be an indicator of level differences of these abilities, a research was conducted on the sample of young football players aged 14 to 16 from the eight clubs, half of them competing in the higher and the other half in the lower level of competition. A sample of measuring instruments consisted of 13 tests for evaluation of five factors of specific endurance: starting endurance, stamina in maintaining the shallow formation, endurance during fast dribbling, ball pressing endurance, and evaluation of technical and tactical efficiency of football players. The results of the research showed that the young players of higher level of competition had significantly greater technical and tactical efficiency, as well as specific performance in tests which included curvilinear movement and dribbling, as well as control and passing the ball in motion, but the difference is not recorded with straight-line movements and sprints.
Key words: differences, specific endurance, technical and tactical efficiency, young football players.

INTRODUCTION

By analyzing football game (structurally, functionally, anatomically, mechanically, motorically...), we receive important information on requests which football players face during games and trainings (Krsmanović, 2014). Football is included in poly-structural, cyclic and acyclic movements, where motoric movements are complexly represented with a high level of maximum consumption of O₂ (Castagna et al.,

umjerenog do maksimalnog. Izvršeni obim rada i ukupna potrošnja energije je velika zbog dugotrajnog rada aktivnosti velikog inteziteta. Fudbaleri imaju visoke nivoe laktatne izdržljivosti i aerobnih sposobnosti zbog strukture i karaktera fudbalske igre (Reilly, Bangsbo i Franks, 2000). Savremena fudbalska igra se sastoji od velikog broja sprinteva, ubrzanja, zaustavljanja, promjena pravca kretanja, uklizavanja, skokova, udaraca, ubacivanja lopte, kretanja s loptom, kretanja bez lopte.

Savremeni fudbal zahtijeva od igrača ispoljavanje visokog nivoa funkcionalnih sposobnosti, tehničko-taktičke efikasnosti, jednom riječju morfofunkcionalne univerzalnosti, kako bi uspješno djelovali u različitim situacijama igre, često u oskudici vremena, ograničenom prostoru i uz aktivno ometanje od strane protivnika (Molnar, 1998). Samo dobar nivo motoričkih i funkcionalnih sposobnosti omogućuje takvo fizičko stanje fudbalera (Reinikainen, 2012), da efikasno djeluje u uslovima visokog psihofizičkog opterećenja tokom svih 90 minuta utakmice.

Poznavanje hijerarhijske strukture elemenata od kojih zavisi rezultat u fudbalu predstavlja osnovni preduslov racionalnog provođenja postupaka u usmjeravanju i selekciji potencijalnih fudbalera (Elsner, 1973), kao i značajan korak efikasnijeg planiranja, programiranja i kontrole trenajnog procesa (Stojanović, Dragosavljević i Kostić, 2009), a na taj način bi se trenajni proces optimizovao sa aspekta vremenskog i energetskog angažmana fudbalera (relacija zamor – oporavak) (Jakonić i Bajić, 1996) u odnosu na finalno efikasno izvođenje tehničko-taktičkih zadataka na utakmici.

Ovakav način kontrole nam omogućuje uvid u faze igre i strukturu kretanja. Osim strukture tehničko-taktičkih elemenata, ovakve informacije nam govore o ponavljanju različitih načina kretanja bez i sa loptom. Posebno moramo istaći procjenu vremensko-prostornih odnosa koje igrač mora sinhronizovati pri rješavanju situacija (Petrić, 1994), a naročito vremenske i prostorne odnose sa kretanjem lopte, protivnikom i da pri tome poštuje pravila fudbalske igre.

Samo pravilno usmjeravanje djece ka sportu, dobra selekcija i dalji stručno-pedagoški rad u organizovanim klubovima zahtijeva planiranje rada po uzrasnim kategorijama na osnovu pokazatelja rasta i razvoja (Siozios, 1992). U radu se prate fizičke i funkcionalne sposobnosti (Molnar, 1998, 2003), smisao za igru, sposobnost rješavanja složenih zadataka i moralno-voljne osobine (Špirtović, 1989).

Cilj ovog istraživanja je da utvrdi na kom su nivou specifična izdržljivost i tehničko-taktička efikasnost mla-

2006; Ramsbottom et al., 1988; Leger & Lambert, 1982). The intensity varies from a moderate to a maximum. Completed scope of work and total energy consumption is high due to prolonged activities of high intensity. Football players have high levels of lactic endurance and aerobic abilities due to the structure and character of the football games (Reilly, Bangsbo & Franks, 2000). Modern football game consists of a large number of sprints, acceleration, stopping, changes of direction, sliding, jumps, kicks, throwing in the ball, movements with the ball and movements without the ball.

Modern football requires from players to demonstrate a high level of functional skills, technical and tactical efficiency, in one word, morpho-functional universality, in order to successfully respond in various situation during the game, often with the lack of time, limited space and with the active obstruction by an opponent (Molnar, 1998). Only a good level of motoric and functional abilities allows such physical condition of players (Reinikainen, 2012), that they can efficiently act under high psychological and physical stress during the 90 minutes of the match.

Knowing the hierarchical structure of the elements on which the result of football depends is a basic precondition for rational implementation of the procedures in directing and selecting process of potential players (Elsner, 1973), as well as a significant step for more efficient planning, programming, and control of the training processes (Stojanović, Dragosavljević & Kostić, 2009), thus to optimize the training process of players in terms of time and energy (liaison fatigue - recovery) (Jakonić & Bajić, 1996) with respect to the final effective implementation of the technical and tactical tasks in the match.

This method of control allows us to see stages of the game and the structure of movement. In addition to the structure of technical and tactical elements, this information tells us about the repetition of different ways of movement with and without the ball. We have to pay special attention to the assessment of temporal and spatial relations which the player must synchronize in order to resolve the situation (Petrić, 1994), and particularly the temporal and spatial relations with the movement of the ball, the opponent and at the same time to comply with football rules.

Only proper guidance of children towards sports, good selection and further professional and educational work in organized clubs requires planning work by age categories on the basis of growth and development indicators (Siozios, 1992). In the study, the physical and functional abilities (Molnar, 1998, 2003), a sense for the game, the ability to resolve complex and moral and volitional qualities are monitored (Špirtović, 1989).

The aim of this study is to determine at which level are the specific endurance and technical and tactical efficiency

dih fudbalera različitog stepena takmičenja, i da li stepen takmičenja može da bude pokazatelj razlike nivoa ovih sposobnosti.

METODE RADA

Uzorak ispitanika

Uzorak ispitanika obuhvaćen ovim istraživanjem je definisan kao namjeran uzorak mladih fudbalera uzrasta od 14 do 16 godina, a čini ga 92 selektirana pojedinca, koji su uključeni u trenazni proces u fudbalskim klubovima kvalitetne lige pionira Republike Srpske, koji čine viši stepen takmičenja i Pionirske lige Federacije BiH, koji čine niži stepen takmičenja. Prvi subuzorak (EG1) čini 45 fudbalera koji se takmiče u pionirskoj ligi Republike Srpske iz sljedećih klubova: FK "Proleter" iz Teslića; AF „Sporting“ iz Teslića; FK „Sloga“ iz Doboja i FK „Željezničar“ iz Doboja. Drugi subuzorak (EG2) čini 47 fudbalera koji se takmiče u pionirskoj ligi Federacije Bosne i Hercegovine iz sljedećih klubova: NK „Borac“ iz Jelaha; NK „Tošk“ iz Tešnja; NK „Usora“ iz Tešanjke i NK „Pobjeda“ iz Tešanjke. Za ovo istraživanje dobijene su saglasnosti klubova, kao i roditelja ispitanika.

Uzorak mjernih instrumenata

Za potrebe ovog istraživanja konstruisana je pogodna baterija mjernih instrumenata izdržljivosti koja po mišljenju autora može da utvrdi postojanje strukture specifične izdržljivosti fudbalera. U konstruisanju baterije od 13 testova autori ovog istraživanja pošli su od zahtjeva: da svi testovi budu realne sekvence kretanja fudbalera; da svi testovi kao motorni zadaci mogu da se izvedu u maksimalnoj brzini; da se obavezno uvažavaju pravila, tehnika i uslovi fudbalske igre. Primenjeni su sljedeći testovi:

- I. Za procjenu faktora specifične startne izdržljivosti u otkrivanju i pokrivanju:
 1. brzo trčanje vijugavo neujednačeno 5x20 m s intervalnim odmorom od 10 sekundi (BTVN5x20)
 2. brzo trčanje s promjenom pravca pod pravim uglom 5x20 m s intervalnim odmorom od 10 sekundi (BTPP5x20)
 3. trčanje na poligonu oko zastavica, osmica, s intervalnim odmorom od 10 sekundi (TPO-SM).
- II. Za procjenu faktora specifične izdržljivosti u održavanju plitke formacije:
 1. brzo trčanje 5x60m s intervalnim odmorom od 10 sekundi (BT5x60)
 2. brzo trčanje 5x80m s intervalnim odmorom od 10 sekundi (BT5x80)

of young football players of different levels of competition, and whether the level of competition can be an indicator of the level differences of these abilities.

METHODS OF WORK

A sample of examinees

The sample included in this study is defined as a deliberate pattern of young football players aged 14 to 16, and it consists of 92 selected individuals, who are involved in the training process in football clubs of quality pioneers' league of Republic of Srpska that are at the higher level of competition and the pioneers' league of Federation of Bosnia and Herzegovina which are at the lower level of competition. The first subsample (EG1) consisted of 45 football players who compete in the pioneer league of Republic of Srpska from the following clubs: FC "Proleter" Teslić; FA "Sporting" from Teslić; FC "Sloga" from Dobjoj i FC "Željezničar" from Dobjoj. The second subsample (EG2) consists of 47 football players who compete in the pioneer league of Federation of Bosnia and Herzegovina from the following clubs: FC "Borac" from Jelajah; FC "Tošk" from Tešanj; FC "Usora" from Tešanjka and FC "Pobjeda" from Tešanjka. For this study approvals from the clubs, as well as the parents of subjects were obtained.

A sample of measuring instruments

For the purposes of the research, suitable battery of measuring instruments of endurance was constructed, which according to the author can determine the existence of structure of specific endurance of players. In constructing the battery consisting of 13 tests, the authors of this study began from following requests: that all tests are realistic sequences of movement of football players; that all tests as motoric tasks can be performed at the maximum speed; to be sure to respect the rules, techniques and requests of the football game. The following tests were applied:

- I. For the assessment of factors of specific starting endurance in opening and covering:
 1. fast running winding unevenly 5x20m with resting interval of 10 seconds (BTVN5x20)
 2. fast running with a change of direction at right angle 5x20m with resting interval of 10 seconds (BTPP5x20)
 3. running on the polygon around flags, eights, with resting interval of 10 seconds (TPOSM)
- II. For the assessment of factors of specific endurance in maintaining shallow formations:
 1. fast running 5x60m with resting interval of 10 seconds (BT5x60)
 2. fast running 5x80m with resting interval of 10 seconds (BT5x80)

- III. Za procjenu faktora specifične sprinterske izdržljivosti:
1. brzo trčanje 5x20m s intervalnim odmorom od 10 sekundi (BT5x20)
 2. brzo trčanje 5x40m s intervalnim odmorom od 10 sekundi (BT5x40)
 3. brzo trčanje 200m (BT200)
- IV. Za procjenu faktora specifične izdržljivosti u brzom vođenju lopte:
1. brzo vođenje lopte vijugavo neujednačeno 5x20m s intervalnim odmorom od 10 sekundi (BVLV5x20)
 2. brzo vođenje lopte promjenom pravca pod pravim uglom 5x20m s intervalnim odmorom od 10 sekundi (BVPP5x20)
- V. Za procjenu faktora specifične presing izdržljivosti na loptu:
1. kombinovani test udarci lopte nogom i glavom u kretanju (KTULNG)
 2. kombinovani test udarci lopte glavom u skoku i padu (KTULG)
 3. kombinovani test udarci lopte glavom nakon primanja lopte grudima i hrptom stopala (KTULN).

Za procjenu tehničko-taktičkih sposobnosti mladih fudbalera projektovan je upitnik koga su ispunili nezavisni licencirani treneri koji rade u klubovima koji su učestvovali u testiranju. Svim trenerima (ocjenjivačima) je dat upitnik za svakog igrača posebno, kako bi mogao zaokružiti samo jedan od ponuđenih odgovora – zaključaka na predloženoj skali od 1 do 9. Treneri su istovremeno ispunili upitnik, bez mogućnosti međusobne komunikacije i dogovaranja. Nakon popune upitnika, za svakog ispitanika je izračunata srednja ocjena, tako što je zbir svih ocjena podijeljen sa osam i zaokružen na cjeli broj, a trenerima nije data mogućnost da imaju uvid u ocjene drugih ocjenjivača.

U procesu treninga, realizujući ili prateći procese obuke i usavršavanje tehničko-taktičkih sposobnosti, ovom skalom od 1 do 9 moguće je procijeniti ove sposobnosti obilježavanjem broja skale:

1. Fond kvalitet tehničko-taktičkih znanja u nivou sportiste početnika (nivo prepoznavanja elemenata),
2. Zna i uspješno primjenjuje mali broj tehničko-taktičkih elemenata,
3. Savladana osnovna tehničko-taktička znanja, ali ih u situacijama takmičenja ne primjenjuje,
4. Savladao osnovna tehničko-taktička znanja, ali ih u situacijama takmičenja teško primjenjuje,

- III. For the assessment of factors of specific sprint endurance:
1. fast running 5x20m with resting interval of 10 seconds (BT5x20)
 2. fast running 5x40m with resting interval of 10 seconds (BT5x40)
 3. fast running 200m (BT200)
- IV. For assessment of factors of specific endurance in fast dribbling:
1. fast dribbling winding unevenly 5x20m with resting interval of 10 seconds (BVLV5x20)
 2. fast dribbling with a change of direction at right angle 5x20m with resting interval of 10 seconds (BVPP5x20)
- V. For assessment of factors of specific pressing endurance on the ball:
1. combined test kicks of the ball with a leg and a head in motion (KTULNG)
 2. combined test kicks of the ball with a head during jump and fall (KTULG)
 3. combined test kicks of the ball with a head after receiving the ball with chests and the foot ridge (KTULN).

For the assessment of the technical and tactical abilities of young football players a questionnaire was designed and it was filled out by independent licensed coaches working in clubs that participated in testing. The questionnaire was given to all coaches (evaluators) for each player individually, in order to circle only one of the given answers- conclusions on presented scale from 1 to 9. Coaches filled out the questionnaire at the same time, without the possibility of mutual communication and consultation. After filling out the questionnaire, the average grade was calculated for each respondent, by dividing the sum of all grades with eight and rounded to an integer, and the coaches had no opportunity to have access into the assessment of other evaluators.

In the process of training, by realizing or following the process of training and improvement of technical and tactical abilities, with this scale from 1 to 9 it is possible to assess these abilities by marking the number of the scale:

1. The quality of technical and tactical knowledge at the level of beginner sportsman (level of recognition of elements).
2. He knows and successfully applies a small number of technical and tactical elements.
3. He mastered the basic technical and tactical knowledge, but he does not apply them in situations of competition.
4. He mastered the basic technical and tactical knowledge, but has difficulties in applying them in situations of

5. Vlada osnovom tehničko–taktičkih znanja i gotovo ih sve uspješno primjenjuje u situacijama takmičenja,
6. Savladao gotovo sve tehničko–taktičke elemente, a neke od njih primjerno primjenjuje u situacijama takmičenja,
7. Savladao sve tehničko–taktičke elemente i mnoge od njih izborno uspješno primjenjuje (na nivou automatizacije) u situacijama takmičenja.
8. Posjeduje znanja kompletnog tehničko–taktičkog repertoara sporta, izborno ih koristi, često na nivou perfekcije u situacijama takmičenja.
9. Posjeduje znanja kompletnog tehničko–taktičkog repertoara i u situacijama takmičenja gotovo sve elemente koristi na nivou perfekcije.

Metode obrade podataka

Za analizu osnovnih statističkih podataka i distribuciju rezultata za obje eksperimentalne grupe su primijenjeni deskriptivni statistički postupci, a izračunati su sljedeći parametri: aritmetička sredina (Mean); najmanji postignuti rezultat (Min.); najveći postignuti rezultat (Max.); raspon minimalnog i maksimalnog rezultata (Range); standardna devijacija aritmetičke sredine (Std.dev.); koeficijent varijacije (Coef.Var.); asimetričnost krivulje distribucije rezultata (Skew.) i spljoštenost krivulje distribucije rezultata (Kurt.) i vrijednost Kolmogorov-Smirnov testa (K-S). Za utvrđivanje razlika između parametara dvije eksperimentalne grupe, primijenjena je jednosmjerna analiza varijanse na multivarijantnom i univarijantnom nivou (one way MANOVA/ANOVA). Podaci su obrađeni u statističkom paketu STATISTICA 7, (StatSoft, Inc., Tulsa, OK).

REZULTATI I DISKUSIJA

Vrijednosti centralnih i disperzionih parametara, mjera asimetrije i spljoštenosti u prostoru specifične izdržljivosti i tehničko taktičkih sposobnosti fudbalera višeg stepena takmičenja (EG1), usmjeravaju na mogućnost primjene parametrijskih postupaka (Tabela 1.). Minimalne (Min.) i maksimalne (Max.) vrijednosti varijabli specifične izdržljivosti fudbalera višeg stepena takmičenja ukazuju da se vrijednosti nalaze u očekivanom rasponu. Vrijednosti koeficijenata varijacije (Coef.Var.) ukazuju na homogenost uzorka fudbalera višeg stepena takmičenja kod svih varijabli, a kreću se u rasponu od 3.31 do 11.31. Vrijednosti simetričnosti krive raspodjele rezultata (Skew.) ukazuju da je raspodjela kod svih varijabli specifične izdržljivosti i tehničko taktičkih sposobnosti ispitanika simetrična, odnosno, da je kriva raspodjele rezultata u granicama normalne i da ima najviše rezultata

competition.

5. He masters the basic technical and tactical knowledge and applies almost all of them successfully in situation of competition.
6. He mastered almost all technical and tactical elements, and some of them he applies exemplary in situations of competition.
7. He mastered all technical and tactical elements and he optionally and successfully applies many of them (at the level of automation) in situations of competition.
8. He has knowledge of the complete technical and tactical sport repertoire, he uses them optionally, often at the level of perfection in situations of competitions.
9. He has knowledge of complete technical and tactical repertoire and uses almost all elements on the level of perfection in situations of competition.

Data processing methods

For the analysis of basic statistical data and distribution of results for both experimental groups, descriptive statistical methods were applied, and the following parameters were calculated: the arithmetic mean (Mean), lowest achieved score (Min.); highest achieved score (Max.); the range of minimum and maximum results (Range); standard deviation of arithmetic mean (Std.dev.); the coefficient of variation (Coef. Var.); the asymmetry of the distribution curve results (Skew.) and the flattening of the curve distribution of results (Kurt.) and the value of the Kolmogorov-Smirnov test (KS). In order to determine the difference between the parameters of the two experimental groups, the one-way analysis of variance on the multivariate and univariate level was applied (one way MANOVA/ANOVA). The data are processed in the statistical package STATISTICA 7, (StatSoft, Inc., Tulsa, OK).

RESULTS AND DISCUSSION

The values of central and dispersion parameters, measures of asymmetry and flattening in a area of specific endurance and technical and tactical abilities of football players of a higher level of competition (EG1), direct to the possibility of applying parametric methods (Table 1). Minimal (Min.) and maximal (Max.) values of the variables of specific endurance of football players of a higher level of competition indicate that the values are in the expected range. The values of the coefficient of variation (Coeff.Var.) indicate the homogeneity of the sample of football players of a higher level of competition in all the variables, ranging from 3.31 to 11.31. Values of symmetrical distribution curve results (Skew.) indicate that the distribution is symmetrical at all the variables of specific endurance and technical and tactical abilities of the exami-

oko srednje vrijednosti. Distribucija vrijednosti uglavnom se kreće u okviru normalne raspodjele (K-S) kod većine testova, osim kod kombinovanog testa udarci lopte nogom i glavom u kretanju (KTULNG), čije su vrijednosti veće od granične (K-S=0.27>0.243). Ovo ukazuje na dobru diskriminativnost svih testova.

Tabela 1. Deskriptivni parametri specifične izdržljivosti i efikasnosti izvođenja tehničko taktičkih zadataka fudbalera – viši stepen (EG1)

Varijabla	N	Mean	Min.	Max.	Range	Std.Dev.	Coef.Var.	Skew.	Kurt.	K-S
BTVN5x20	45	6.00	5.59	6.44	0.85	0.23	3.82	0.34	-0.93	0.14
BTPP5x20	45	6.58	5.92	7.31	1.39	0.39	5.91	0.33	-0.96	0.15
TPOSM	45	6.12	5.71	6.48	0.77	0.20	3.31	0.04	-0.83	0.09
BT5x60	45	9.14	8.25	9.99	1.74	0.36	3.99	-0.00	0.09	0.06
BT5x80	45	11.58	10.68	12.19	1.51	0.41	3.57	-0.58	-0.47	0.11
BT5x20	45	3.43	3.02	4.01	0.99	0.28	8.21	0.38	-1.18	0.15
BT5x40	45	6.19	5.46	6.81	1.35	0.30	4.80	-0.02	0.30	0.09
BT200	45	36.45	29.60	45.38	15.78	3.09	8.49	0.68	1.90	0.20
BVLV5x20	45	8.56	7.44	9.90	2.46	0.63	7.32	0.52	-0.41	0.09
BVPP5x20	45	9.47	8.32	10.81	2.49	0.59	6.20	0.37	-0.14	0.09
KTULNG	45	11.13	9.00	13.00	4.00	1.12	10.06	-0.58	-0.69	0.27*
KTULG	45	10.73	8.00	13.00	5.00	1.21	11.31	-0.26	0.19	0.18
KTULN	45	10.69	8.00	13.00	5.00	1.04	9.74	-0.34	0.07	0.24
OCENA TT	45	6.80	5.00	9.00	4.00	1.18	17.34	-0.03	-0.81	0.19

Legenda: N – broj ispitanika; Mean – aritmetička sredina; Std.Dev. – standardna devijacija; Min. – minimalni rezultat; Max. – maksimalni rezultat; Range – raspon rezultata; Coef. Var. – koeficijent varijacije; Skew. – simetričnost krive raspodele rezultata; Kurt. – spljoštenost krive raspodele rezultata; K-S – Kolmogorov-Smirnov test normalnosti krivulje distribucije (granična vrednost za uzorak od 45 ispitanika iznosi 0.243).

Vrijednosti centralnih i disperzionih parametara, mjera asimetrije i spljoštenosti u prostoru specifične izdržljivosti i tehničko taktičkih sposobnosti fudbalera nižeg stepena takmičenja, usmjeravaju na mogućnost primjene parametrijskih postupaka (Tabela 2.). Minimalne (Min.) i maksimalne (Max.) vrijednosti varijabli specifične izdržljivosti fudbalera nižeg stepena takmičenja ukazuju da se vrijednosti nalaze u očekivanom rasponu. Vrijednosti koeficijentata varijacije (Coef.Var.) ukazuju na homogenost uzorka fudbalera nižeg stepena takmičenja kod svih varijabli, a kreću se u rasponu od 4.59 do 13.69. Vrijednosti simetričnosti krive raspodjele rezultata (Skew.) ukazuju da je raspodjela kod svih varijabli specifične

nees, i.e. that the results distribution curve is within normal limits, having the most results around the mean value. Distribution of values generally remains within the normal distribution (K-S) with most tests, except for the combined test kicking ball with a leg and a head in movement (KTULNG), where the values are greater the limit (K-S=0.27>0.243). This indicates good discriminability of all tests.

Table 1. Descriptive parameters of specific endurance and efficiency of performing technical and tactical tasks of football players- higher level (EG1)

Legend: N - number of subjects; Mean – arithmetic mean; Std. Dev. - Standard deviation; Min. - The minimum score; Max. - The maximum score; Range - the range of results; Coef. Var. - Coefficient of variation; Skew. - Symmetry of the curve distribution of results; Kurt. - Flattening the curve of distribution of results; HP - the Kolmogorov-Smirnov test for normality distribution curve (limit for the sample of 45 subjects was 0.243).

The values of central and dispersion parameters, measures of asymmetry and flattening in a area of specific endurance and technical and tactical abilities of football players of lower level of competition, direct to the possibility of applying parametric methods (Table 2.). Minimum (Min.) and maximal (Max.) values of the variables of specific endurance of football players of lower level of competition indicate that the values are in the expected range. The values of the coefficient of variation (Coef. Var.) indicate the homogeneity of the sample of players of lower level of competition in all the variables, ranging from 4.59 to 13.69. Values of symmetrical curve results distribution (Skew.) indicate that the distribution at all the variables of

izdržljivosti i tehničko taktičkih sposobnosti ispitanika simetrična, odnosno, da je kriva raspodjele rezultata u granicama normalne i da ima najviše rezultata oko srednje vrijednosti. Distribucija vrijednosti se kreće u okviru normalne raspodjele (K-S) kod svih testova, obzirom da su im vrijednosti manje od granične (K-S<0.238). Ovo ukazuje na dobru diskriminativnost svih testova.

Tabela 2. Deskriptivni parametri specifične izdržljivosti i efikasnosti izvođenja tehničko taktičkih zadataka fudbalera – niži stepen (EG2)

Varijabla	N	Mean	Min.	Max.	Range	Std.Dev.	Coef.Var.	Skew.	Kurt.	K-S
BTVN5x20	47	6.32	5.52	7.04	1.52	0.35	5.49	0.25	-0.11	0.09
BTPP5x20	47	6.85	6.13	7.75	1.62	0.38	5.57	0.46	-0.18	0.09
TPOSM	47	6.39	5.84	7.18	1.34	0.38	6.00	0.59	-0.60	0.10
BT5x60	47	9.27	7.35	11.00	3.65	0.89	9.58	-0.29	-0.04	0.08
BT5x80	47	11.70	10.50	13.10	2.60	0.76	6.52	0.25	-1.18	0.12
BT5x20	47	3.49	2.97	4.06	1.09	0.29	8.25	0.26	-1.15	0.12
BT5x40	47	6.27	5.48	6.86	1.38	0.29	4.59	-0.10	0.61	0.09
BT200	47	36.59	29.70	45.43	15.73	3.15	8.61	0.66	1.46	0.19
BVLV5x20	47	8.99	7.68	10.86	3.18	0.73	8.07	0.79	0.53	0.10
BVPP5x20	47	9.91	8.71	11.75	3.04	0.71	7.21	0.71	-0.00	0.09
KTULNG	47	10.15	8.00	12.00	4.00	1.08	10.67	-0.09	-0.56	0.17
KTULG	47	10.09	8.00	13.00	5.00	1.38	13.69	0.72	0.04	0.21
KTULN	47	9.96	8.00	12.00	4.00	1.16	11.65	0.09	-0.71	0.17
OCENA TT	47	5.70	4.00	8.00	4.00	1.23	21.61	0.02	-0.99	0.19

Legenda: N – broj ispitanika; Mean – aritmetička sredina; Std.Dev. – standardna devijacija; Min. – minimalni rezultat; Max. – maksimalni rezultat; Range – raspon rezultata; Coef.Var. – koeficijent varijacije; Skew. – simetričnost krive raspodjele rezultata; Kurt. – spljoštenost krive raspodjele rezultata; K-S – Kolmogorov-Smirnov test normalnosti krivulje distribucije (granična vrednost za uzorak od 47 ispitanika iznosi 0.238).

Analizom dobijenih rezultata na multivarijantnom nivou, može se konstatovati da između fudbalera pionirskog uzrasta koji se takmiče u dva različita stepena takmičenja, postoji statistički značajna razlika u ispitivanim prostorima specifične izdržljivosti i tehničko taktičkih sposobnosti, čija vrijednost Wilks' Lambde (0.622) i Rao-ve aproksimacija (F=3.34), uz stepene slobode 14 i 77, ukazuju na statističku značajnost razlika na nivou p=0.000 (Tabela 3.).

specific endurance and technical and tactical abilities of subjects is symmetrical, i.e. that the results distribution curve is within normal limits, having the most results around the mean value. Distribution of values remain within the normal distribution (K-S) in all tests, considering that their values are less than the limit (K-S<0.238). This indicates good discriminability of all tests.

Table 2. Descriptive parameters of specific endurance and efficiency of performing technical and tactical tasks of football players- lower level (EG2)

Legend: N - number of subjects; Mean – arithmetic mean; Std.Dev. - Standard deviation; Min. - The minimum score; Max. - The maximum score; Range - the range of results; Coef.Var. - Coefficient of variation; Skew. - Symmetry of the curve distribution of results; Kurt. - Flattening the curve of distribution of results; HP - the Kolmogorov-Smirnov test for normality distribution curve (limit value for the sample of 47 subjects was 0.238).

Analysing the results at the multivariate level, it can be concluded that between football players of the pioneer age who compete in two different levels of competition, there is a statistically significant difference in the examined areas of specific endurance and technical and tactical abilities, whose value Wilk's lambda (0.622) and Rao's approximation (F=3.34), with degrees of freedom 14 and 17, indicate a statistically significant difference at the level of p=0.000 (Table 3.).

Tabela 3. Multivarijantne razlike specifične izdržljivosti i efikasnosti izvođenja tehničko taktičkih zadataka između fudbalera višeg i nižeg stepena takmičenja

Wilk's Lambda	F	Effect df	Error df	Q
0.622	3.34	14	77	0.000*

Wilks' Lambda – vrijednost koeficijenta Wilksovog testa za jednakost centrioda grupa; **F** – vrednost koeficijenta F-testa za značajnost Wilks'ove Lamde; **Effect df** i **Error df** – stepeni slobode; **Q** – koeficijent značajnosti razlika centrioda grupa; * statistički značajna razlika.

Na univarijantnom nivou se može uočiti da su razlici između fudbalera različitih stepena takmičenja (Tabela 4.) doprinijele statistički značajne razlike na nivou značajnosti $p \leq 0.01$ u testovima za procjenu faktora startne izdržljivosti u otkrivanju i pokrivanju (BTVN5x20; BTPP5x20 i TPO-SM5x), faktora specijalne izdržljivosti u brzom vođenju lopte (BVLV5x20 i BVPP5x20) i faktora presing izdržljivosti na loptu (KTULNG; KTULG i KTULN), ali i razlika u tehničko taktičkim sposobnostima u korist fudbalera višeg stepena takmičenja. Kod testova za procjenu faktora specifične izdržljivosti u održavanju plitke formacije (BT5x60 i BT5x80) i faktora specifične sprinterske izdržljivosti (BT5x20; BT5x40 i BT200) nije konstatovana značajna razlika.

Tabela 4. Univarijantne razlike specifične izdržljivosti i efikasnosti izvođenja tehničko taktičkih zadataka između fudbalera višeg i nižeg stepena takmičenja

Varijabla	Mean (EG1)	Mean (EG2)	Diff.	F (1,90)	p
BTVN5x20	6.00	6.32	-0.32	26.83	0.000*
BTPP5x20	6.58	6.85	-0.27	11.04	0.001*
TPOSM	6.12	6.39	-0.27	16.44	0.000*
BT5x60	9.14	9.27	-0.13	0.87	0.354
BT5x80	11.58	11.70	-0.12	0.94	0.335
BT5x20	3.43	3.49	-0.06	1.25	0.267
BT5x40	6.19	6.27	-0.08	1.47	0.229
BT200	36.45	36.59	-0.14	0.04	0.835
BVLV5x20	8.56	8.99	-0.43	9.49	0.003*
BVPP5x20	9.47	9.91	-0.44	10.20	0.002*
KTULNG	11.13	10.15	0.98	18.37	0.000*
KTULG	10.73	10.09	0.64	5.70	0.019*
KTULN	10.69	9.96	0.73	10.10	0.002*
OCENA TT	6.80	5.70	1.10	19.03	0.000*

Mean – aritmetička sredina; **Diff.** – razlika aritmetičkih sredina; **F** – vrednost F-testa za testiranje značajnosti razlika aritmetičkih sredina; **p** – koeficijent značajnosti razlika aritmetičkih sredina; * statistički značajna razlika.

Table 3. Multivariate differences of specific endurance and efficiency of performing technical and tactical tasks between football players of higher and lower level of competition

Wilks' Lambda - the value of coefficient of Wilks test for equality of group centroid; **F** - The coefficient of F-test for significance Wilks' Lambda; **Effect df** **Error** and **df** - degrees of freedom; **Q** - coefficient of difference significance of groups centroid; * Statistically significant difference.

At the univariate level, it can be noticed that the significant differences in the level of significance $p < 0.01$ in the tests for the assessments of the factors of starting endurance in opening and covering (BTVN5x20; BTPP5x20 i TPOSM5x), special endurance factors in the fast dribbling (BVLV5x20 i BVPP5x20) and the factor of pressing endurance on the ball (KTULNG; KTULG i KTULN), as well as difference in the technical and tactical abilities in favour of players of a higher level of competition, contributed to the difference between football players of different level of competition (Table 4). In tests for assessment of factors of specific endurance in maintaining shallow formations (BT5x60 i BT5x80) and factors of specific sprint endurance (BT5x20; BT5x40 i BT200), significant difference was not noted.

Table 4. Univariate differences of specific endurance and efficiency of performing of technical and tactical tasks between football players of higher and lower levels of competition

Mean - arithmetic mean; **Diff.** - Differences in arithmetic means; **F** - value of F-test for testing significance of differences of arithmetic means; **p** - coefficient of the significance of differences of arithmetic means; * Statistically significant difference

U diskusiji utvrđenih razlika može se konstatovati da su fudbaleri pionirskog uzrasta višeg stepena takmičenja imali značajno bolje rezultate u prostoru specifične startne izdržljivosti u otkrivanju i pokrivanju, specifične izdržljivosti u brzom vođenju lopte i specifične presing izdržljivosti na loptu, dok ta razlika nije uočena u prostoru specifične izdržljivosti u održavanju plitke formacije i specifične sprinterske izdržljivosti. Uzroke ovakvih razlika možemo pripisati višem nivou tehničko-taktičkih sposobnosti fudbalera višeg stepena takmičenja, obzirom da nastale razlike egzistiraju u testovima gdje se zadaci izvode u krivolinijskom kretanju i vođenju lopte, kao i u testovima kontrole i dodavanja lopte u kretanju, dok tih razlika nema kod testova pravolinijskih sprinteva i sprinteva u cilju održavanja plitke formacije. Do ovakvih rezultata su došli i drugi istraživači (Ćeremiđić, 2013; Hadžić, 2004). Nesumljivo je da nivo kontrole lopte značajno utiče na kvalitet izvođenja testova u kojima rezultat u velikoj mjeri zavisi od tehničke osposobljenosti igrača (Siozios, 1992), a manje od njihove brzine i izdržljivosti (Bozalacis, 1999), obzirom da je bolji rezultat onaj koji ima manju vrijednost u sekundama. Svaka greška koja se javlja u baratanju i vođenju lopte, kao i u kretanju po krivolinijskim putanjama, donosi značajne razlike u konačnom vremenu trajanja testova, te su i fudbaleri višeg i nižeg stepena takmičenja postigli različite rezultate u testovima ovih sposobnosti.

U daljoj diskusiji se može pretpostaviti da je i period bavljenja fudbalom igrača višeg i nižeg stepena takmičenja različit, odnosno da su fudbaleri višeg stepena duže u trenažnom procesu, obzirom da je nivo usvojenosti tehničkih elemenata fudbalske igre u značajnoj korelaciji sa dužinom treniranja. Nesporno je da i talenat fudbalera ima uticaja na dužinu trajanja usvajanja tehnike, ali je ta zavisnost znatno veća u odnosu na dužinu treniranja, obzirom da se majstorstvo u fudbalu postiže tek nakon višegodišnjeg treninga.

ZAKLJUČAK

Eksperimentalni podaci koji su prikupljeni i prikazani u ovom istraživanju nedvosmisleno pokazuju da parametri specifične izdržljivosti i tehničko-taktičke efikasnosti imaju veće vrijednosti kod mladih fudbalera višeg stepena takmičenja u odnosu na one iz nižeg stepena. Jedan od glavnih razloga ovakvih rezultata jeste činjenica, da je nivo tehničko-taktičke efikasnosti značajno uticao na ishod u testovima specifične izdržljivosti, obzirom da je sadržaj tih testova bio povezan sa rješavanjem složenih tehničkih zadataka za određeno vrijeme. Takođe se može konstatovati da su rezultati postignuti u testovima spe-

In the discussion of the determined differences it can be noted that players of pioneer age of higher level of competition had significantly better results in the area of specific starting endurance in opening and covering, specific endurance in fast dribbling and specific pressing endurance on the ball, whereas this difference was not noted in the area of specific endurance in maintaining shallow formations and specific sprint endurance. Causes of these differences can be attributed to the higher level of technical and tactical abilities of football players of a higher level of competition, considering that the differences exist in the tests where tasks are performed in curvilinear movement and dribbling of the ball, as well as tests of controls and passing of the ball in motion, whereas such differences were not present in tests of straight-line sprints with the aim of maintaining shallow formations. Various researchers also obtained these results (Ćeremiđić, 2013; Hadžić, 2004). There is no doubt that the level of ball control significantly affects the quality of performance of tests in which result largely depends on the technical readiness of player (Siozios, 1992), and less on their speed and endurance (Bozalacis, 1999), considering that the better result is the one having lower value in seconds. Any error that occurs in handling and dribbling, as well as in movement on the curvilinear paths, makes significant difference in the final duration of the tests, and the football players of higher and lower level of competition achieved different results in tests of these abilities.

In further discussion, it can be assumed that the period of playing football by football players of higher and lower level of competition is different, or that the players of a higher level of competition spent longer in the training process, given that the level of acquiring technical elements of football game is significantly correlated with the length of training. It is also indisputable that talent of players have an impact on the length of the adoption of the technique, but the dependence is much higher compared to the length of training, given that mastery in football is achieved only after years of training.

CONCLUSION

Experimental data collected and presented in this study unambiguously show that the parameters of specific endurance and technical and tactical efficiency have higher values with young football players of higher level of competition compared to those of the lower level. One of the main reasons for these results is the fact that the level of technical and tactical efficiency significantly influenced the outcome of the tests of specific endurance, considering that the content of these tests was associated with solving complex technical tasks in a certain period of time. It can also

cifične izdržljivosti koji su sadržali samo pravolinijska kretanja, bez zadataka sa loptom, bili istog nivoa u obje eksperimentalne grupe. Na osnovu ovakvih konstatacija se može izvesti zaključak, da stepen takmičenja nije presudan za postignuti nivo specifične izdržljivosti u kojoj su kretanja pravolinijska i ne sadrže baratanje loptom, ali da je važan u onim karakteristikama izdržljivosti, gdje je zastupljeno krivolinijsko kretanje i vođenje lopte, kao i kontrola i dodavanje lopte u kretanju.

be concluded that the results achieved in tests of specific endurance which contained only straight-line movement, without tasks with the ball, had the same levels in both experimental groups. On the basis of these statements it can be concluded that the level of competition is not crucial for the achieved level of specific endurance in which movements are straight-lined and do not include handling the ball, but it is important in characteristics of endurance in which curvilinear movement and dribbling of the ball are included, as well as control and passing the ball in motion.

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Primljen: 02. novembra 2015. / Received: November 02, 2015
 Prihvaćen: 26. novembar 2015. / Accepted: November 26, 2015