

Top Footballer Model Based on Indicators of Situational Efficiency in Round of 16 at the 2010 Fifa World Cup

¹ Teacher Training Faculty, Džemal Bijedić University of Mostar, Bosnia and Herzegovina

² Faculty of Sport and Physical Education, University of Sarajevo, Bosnia and Herzegovina

Original scientific paper

Abstract

The aim of this research is to determine the model of top footballers on different field positions based on the indicator of situational efficiency. The research was carried out on a sample of 167 top footballers aged 19 to 39 who played the full 90-minute match length in the Round of 16 at the 2010 FIFA World Cup in South Africa. Both central and dispersion parameters were used to determine the top footballer model. Based on the results of the research, we can conclude that contemporary footballers have a mean age of 26.70 ± 3.73 , a mean height of $180.29 \text{ cm} \pm 6.38$, and that they covered a mean distance of $9,692 \text{ m} \pm 2,579$. When their team was in ball possession players covered $3,742 \text{ m} \pm 1,137$, and when they were not in ball possession players covered $3,917 \text{ m} \pm 1,197$. The average number of sprints the footballers achieved was 93.33 ± 42.87 whereas the mean velocity was at $22.81 \text{ km/h} \pm 3.14$. Based on the intensity of their activities, we can notice that footballers, on average, spend $83.87\% \pm 5.58$ (most of their in-game time) in low intensity, $7.82\% \pm 2.73$ in medium intensity activities and $8.41\% \pm 3.10$ in high intensity activities. Footballers achieved 31.65 ± 15.80 successful passes, whereas there was a significantly higher mean indicator of unsuccessful passes i.e. 45.65 ± 18.15 .

Key words: **football, top footballers, movement, situational efficiency**

Introduction

Exhibiting specific football skills and an individual's characteristics as well as cooperation of team members have a significant impact on the achievement of positive results in a football match. Football consists of explosive movements like ball shots, turns, jumps, and sprints, all happening with an average heart frequency of 80 to 90 per cent (Arnason et al, 2004). In the evolution of football, game models have often changed. Speaking of contemporary models of football today, it ought to be necessarily emphasized that the game itself has become more dynamic, faster and harsher. Along with this, the pressure onto footballers has increased both in training and in matches. Great improvements in football along with new training methods have contributed to an overall development of the footballer's physique (Bangsbo et al, 2006). There are two activities footballer performs in a match: activities with the ball and activities without the ball (Bangsbo et al, 2006). Taking into account the total number of players in a match and the pitch dimension, it doesn't come as a surprise that individual player's activities without the ball account for 95% (on average) of the effective match time. Even the total physical activity of a footballer includes a variety of different activities, the majority of that total is walking and running in different speeds and directions. Therefore,

the distance covered in a match is a global indicator of the physical demands of a football match (as well as the footballer's total physical activity). Nowadays, top football players cover a distance of 10 to 13 km on average in a match; midfield players cover most of all players, whereas goalkeepers achieve 4km (Verheijen, 1997; Moher et al, 2003; Krusturp et al, 2005; Lago et al, 2010; Andrzejewski et al, 2012). Since players constantly change their speed during a match, it is necessary that the total distance covered be divided into categories based on the velocity (intensity) of movement (Di Salvo et al, 2006; Barros et al, 2007; Lago et al, 2010). A majority of researchers in the world have so far managed to divide into categories the distance footballers cover in a match. However, the defined categories of activities differ from author to author which adds difficulty to comparing them. Moreover, latest results from Champions League analysis clearly suggest that top players, on average, of their overall time in the game (i.e. 58%) spend standing (15%) and walking (43%), about 30% running to and fro (7 to 14 km/h), about 8% run in average speed (15 to 19 km/h), about 3% of the time players run a fast speed (20 to 25 km/h), and only 1% of the time on maximum speed sprint (Moher et al, 2003). If we convert these time percentages into distances covered then we can conclude that professional players walk a distance of about 4km (span: 3.2 to 4.7 km), run to and fro

about 4.5km (span: 3.4 to 6.1km), run in medium speed about 1.8km (span: 1.2 to 2.7km), run fast about 0.7km (span: 0.4 to 1.0km), and sprint about 0.3km (span: 0.2 to 0.4km) (Moher et al, 2003). One interesting note is to be made i.e. about 50% of the total covered distance fall onto running in a straight line, whereas the rest falls onto backward movement, side movement, zigzag and movement in a circle etc. (Marković and Bradić, 2008). A professional footballer performs about 30 to 35 sprints during a match, each sprint lasting 2 seconds on average.

Methodology

Sample of subjects

The research was conducted on a sample of 167 top football players aged 19 to 39 who played the full 90-minute match length in the Round of 16 at the 2010 FIFA World Cup in South Africa. The sample consists of the starting lineups of the following national teams: Uruguay, South Korea, USA, Ghana, Germany, England, Argentina, Mexico, Holland, Slovakia, Brazil, Chile, Paraguay, Japan, Spain and Portugal.

Sample of variables

The data was taken from the official FIFA web page (www.fifa.com) where we can find all parameters related to team success and situational efficiency of all players played at the 2010 FIFA World Cup in South Africa. To assess the situational efficiency of top footballers we used the following variables: AGE – age, AVIS – height, SEPRD – distance covered, SEPRDPL – distance covered in possession of ball, SEPRDBPL – distance covered without ball, SEBRSP – number of sprints, SEMAXB – maximum speed,

SEVANIS –time activities (low), SEVASRE –time activities (medium), SEVAVIS – time activities (high) SEBUDO – number of successful passes, SEBND0 – number of unsuccessful passes.

Data processing methodology

The data processing was conducted in SPSS 12.0 software package for Windows. Both central and dispersion parameters were measured for each variable applied. The normality of result distribution was tested based on the Skewness coefficient and the coefficient of Kurtosis.

Results and discussion

Table 1 shows the results of central and dispersion parameters for 167 footballers who played in the Round of 16 at the 2010 World Cup. The normality of the distribution curve of the tested variables on each position (tables 1 to 5) operates in a way that we can tell that neither of them significantly deviates from normal distribution. This, moreover, shows the pervasive nature of the results and a good sensibility to applied values in this research. For a majority of the variables the Skewness and Kurtosis values range from -1 to +1.

The research includes footballers who played the full 90-minute match length in the Round of 16 of the 2010 World Cup. The average player age was 26.70 ± 3.73 , whereas the average height was $180.29 \text{ cm} \pm 6.38$. According to studies (Đurašković, Joksimović; Joksimović 2004) conducted with footballers who took part in the 2002 World Cup the average age was 27.49 ± 3.87 , whereas the average height was $180.90 \text{ cm} \pm 6.13$. According to studies (Joksimović, Smajić, Molnar; Stanković

Table 1 – Central and dispersion parameters (all footballers)

Variable	N	Range	Min.	Max.	Mean	Std.	Variance	Skew.	Kurt.
AGE	167	20.00	19.00	39.00	26.70	3.73410	13.944	.136	-.410
AVIS	167	29.00	168.00	197.00	180.29	6.38760	40.801	.061	-.417
SEPRD	167	13082.00	3048.00	16130.00	9692.33	2579.06	6651565.44	-.502	.452
SEPRDPL	167	5534.00	1184.00	6718.00	3742.62	1137.84	1294688.53	-.041	.131
SEPRDBPL	167	5624.00	1102.00	6726.00	3917.11	1197.94	1435077.45	-.241	.025
SEBRSP	167	215.00	.00	215.00	93.33	42.87	1837.875	-.171	.127
SEMAXB	167	18.63	12.87	31.50	22.81	3.14813	9.911	-.153	1.08
SEVANIS %	167	25.00	74.00	99.00	83.87	5.58956	31.243	1.15	1.35
SEVASRE %	167	13.00	1.00	14.00	7.8263	2.73967	7.506	-.899	1.20
SEVAVIS %	167	13.00	.00	13.00	8.4192	3.10330	9.630	-1.04	.879
SEBUDO	167	97.00	1.00	98.00	31.6587	15.80	249.901	.961	2.28
SEBND0	167	95.00	11.00	106.00	45.6587	18.15	329.539	.637	1.13

2009) conducted with footballers who took part in the UEFA EURO 2008 the mean age was 27.57 ± 3.98 with an average height of $182.97 \text{ cm} \pm 6.59$. Top players' mean age was between 25 and 27 with an age variation of about two years; in Croatia and Serbia the average is about 23 ± 3 years of age (Jerković, Jerković, Sporiš 2006). Studies of Bloomfield et al (2005) show that, out of four European football leagues, players in the German football league (Bundesliga) are tallest with a mean height value of $1.83 \text{ cm} \pm 0.06$, whereas footballers in the Spanish La Liga are shortest with a mean height of $1.80 \text{ cm} \pm 0.06$. Top footballers in Croatia have a mean height of $178.73 \text{ cm} \pm 5.81$ (Jerković, Jerković, Sporiš 2006), and Serbian players $181.9 \text{ cm} \pm 5.7$. Footballers in Bosnia and Herzegovina, on average, age between 24.5 ± 5.7 with a height of $182.2 \text{ cm} \pm 6.63$ (Čolakhodžić, Fazlagić, Vidović, 2010). Players covered an average distance of $9,692 \text{ m} \pm 2,579$. When the team was in ball possession footballers covered a distance of $3,742 \text{ m} \pm 1,137$ and when the team was not in ball possession they covered $3,917 \text{ m} \pm 1,197$. The mean value of sprints the footballers achieved was 93.33 ± 42.87 whereas the average speed was $22.81 \text{ km/h} \pm 3.14$. Judging by the intensity of activities we can see that footballers spent most time playing in low intensity mode i.e. $83.87\% \pm 5.58$; in medium intensity they spent $7.82\% \pm 2.73$ and in high activity they spent $8.41\% \pm 3.10$ of the total match time. The players had 31.65 ± 15.80 successful passes on average, and 45.65 ± 18.15 unsuccessful passes.

Table 2 shows central and dispersion parameters for each goalkeeper who took part in the Round of 16 at the 2010 World Cup. The research includes 16 goalkeepers with a mean age of 28.25 ± 4.05 , mean height of $187.12 \text{ cm} \pm 5.96$. According to studies (Cigrovski, Kros; Martinčević 2010) conducted on goalkeepers of five national leagues (Italy, Germany, France, Spain, England) in season 2008/2009, the mean goalkeeper age was 29.98 ± 4.75 with a mean height of $188.87 \text{ cm} \pm 3.95$. Studies (Joksimović, Smajić, Molnar; Stanković 2009) which analyzed goalkeepers who played the UEFA EURO 2008 had a mean age of 29.42 ± 4.76 and a mean height of $189.06 \text{ cm} \pm 4.54$. According to studies (Đurašković, Joksimović; Joksimović 2004) conducted with goalkeepers who played the 2002 World Cup, the subjects had a mean age of 29.50 ± 4.34 with a mean height of $186.42 \text{ cm} \pm 3.95$. The goalkeepers covered a mean distance of $4,437 \text{ m} \pm 877$; when their team was in ball possession, goalkeepers covered a mean distance $1,621 \text{ m} \pm 328$, whereas, when their team was not in ball possession goalkeepers covered $1,601 \text{ m} \pm 343$. The mean sprint number goalkeepers performed was 8.1 ± 5.58 with a mean velocity of $17.18 \text{ km/h} \pm 2.46$. Judging by the intensity of activities, it can be pointed out that goalkeepers, on average, spend most of their time playing in a low intensity activity mode i.e. $97.75\% \pm .683$; medium intensity activity mode made up $1.25\% \pm .447$ whereas $1\% \pm .632$ went on high intensity activity mode. Goalkeepers had a mean successful passing rate of 19.62 ± 8.4 and a mean unsuccessful passing rate of 34.56 ± 8.19 .

Table 2. Central and dispersion parameters (goalkeepers)

Variable	N	Range	Min.	Max.	Mean	Std.	Variance	Skew.	Kurt.
AGE	16	16.00	23.00	39.00	28.25	4.05	16.467	1.23	2.04
AVIS	16	23.00	174.00	197.00	187.12	5.96	35.583	-.289	.345
SEPRD	16	2978.00	3048.00	6026.00	4437.50	877.03	769190.40	.199	-.932
SEPRDPL	16	1009.00	1184.00	2193.00	1621.87	328.35	107817.85	.438	-.856
SEPRDBPL	16	1048.00	1102.00	2150.00	1601.50	343.02	117663.60	.145	-1.34
SEBRSP	16	17.00	2.00	19.00	8.3125	5.4125	29.296	.459	-.955
SEMAXB	16	8.82	12.87	21.69	17.18	2.46	6.083	-.242	-.418
SEVANIS %	16	2.00	97.00	99.00	97.75	.683	.467	.358	-.592
SEVASRE %	16	1.00	1.00	2.00	1.25	.44	.200	1.27	-.440
SEVAVIS %	16	2.00	.00	2.00	1.00	.63	.400	.000	.027
SEBUDO	16	28.00	8.00	36.00	19.62	8.45	71.450	.637	-.741
SEBND0	16	27.00	20.00	47.00	34.56	8.19	67.196	-.290	-.474

Table 3. Central and dispersion position parameters (defensive players)

Variable	N	Range	Min.	Max.	Mean	Std.	Variance	Skew.	Kurt.
AGE	66	16.00	19.00	35.00	27.71	3.64	13.285	-.365	-.653
AVIS	66	28.00	168.00	196.00	180.57	5.87	34.525	.156	-.208
SEPRD	66	9721.00	4703.00	14424.00	10273.42	1780.99	3171939.14	.163	.822
SEPRDPL	66	3923.00	1720.00	5643.00	3833.00	843.63	711720.76	.441	-.295
SEPRDBPL	66	4316.00	2075.00	6391.00	4276.48	826.47	683058.13	.561	.404
SEBRSP	66	178.00	37.00	215.00	97.83	37.69	1420.541	.610	.324
SEMAXB	66	9.78	19.63	29.41	22.88	2.14101	4.584	1.01	1.08
SEVANIS %	66	11.00	78.00	89.00	83.86	2.92410	8.550	-.307	-.778
SEVASRE %	66	6.00	5.00	11.00	7.83	1.31948	1.741	.234	-.345
SEVAVIS %	66	8.00	5.00	13.00	8.33	2.04814	4.195	.497	-.529
SEBUDO	66	73.00	9.00	82.00	37.30	12.90	166.584	.637	1.21
SEBND0	66	91.00	14.00	105.00	52.43	16.28	265.081	.689	1.36

Table 4. Central and dispersion position parameters (midfield players)

Variable	N	Range	Min.	Max.	Mean	Std.	Variance	Skew.	Kurt.
AGE	52	13.00	20.00	33.00	25.76	3.78654	14.338	.084	-1.07
AVIS	52	21.00	168.00	189.00	178.59	5.84861	34.206	-.153	-.905
SEPRD	52	12304.00	3826.00	16130.00	10952.00	2123.75	4510353.49	-.161	1.87
SEPRDPL	52	5383.00	1335.00	6718.00	4279.32	1099.38	1208649.47	.206	.191
SEPRDBPL	52	4766.00	1960.00	6726.00	4485.55	1010.02	1020148.84	.153	-.021
SEBRSP	52	171.00	32.00	203.00	109.34	32.72	1070.780	.462	.454
SEMAXB	52	14.25	16.06	30.31	23.5452	2.62256	6.878	.446	1.13
SEVANIS %	52	13.00	74.00	87.00	80.0769	3.04764	9.288	-.110	-.295
SEVASRE %	52	8.00	6.00	14.00	9.8269	1.79018	3.205	.313	-.546
SEVAVIS %	52	6.00	7.00	13.00	10.4423	1.47414	2.173	-.284	-.178
SEBUDO	52	97.00	1.00	98.00	36.1923	17.56	308.668	1.34	3.42
SEBND0	52	93.00	13.00	106.00	49.4038	19.15	366.991	.667	1.47

Table 3 shows central and dispersion parameters for defensive players who played the Round of 16 at 2010 FIFA World Cup. The research included 66 defensive players with a mean age of 27.71 ± 3.64 , and a mean height of $180.57 \text{ cm} \pm 5.87$. According to studies (Đurašković, Joksimović; Joksimović 2004) conducted with defensive players who played the 2002 World Cup, defensive players had a mean age of 27.60 ± 3.65 with a mean height of $181.87 \text{ cm} \pm 5.57$. Further studies (Joksimović, Smajić, Molnar; Stanković 2009) conducted with defensive players who took part in UEFA EURO 2008 showed that subjects had a mean age of 27.79 ± 3.56 and a mean height of $184.69 \text{ cm} \pm 5.43$. Defensive players covered a mean distance of $10,273.42 \text{ m} \pm 1,780$; when their team was in ball possession, defensive players covered a distance of $3,833 \text{ m} \pm 843$ and when their team was not in ball possession subjects covered a distance of $4,276 \text{ m} \pm 826$. The mean number of sprints the subjects performed was 97.83 ± 37.69 with a mean speed of $22.88 \text{ km/h} \pm 2.14$. Considering the intensity of activities we can point out defensive players spent most of their time in a low intensity activity mode i.e. $83.86\% \pm 2.92$; medium intensity activities made up $7.83\% \pm 1.31$ whereas high intensity activi-

ties made up $8.33\% \pm 2.04$ of the overall match duration. The subjects had a mean successful passing rate of 37.30 ± 12.90 and a mean unsuccessful passing rate of 52.43 ± 16.28 .

Table 4 shows the central and dispersion parameters for all midfield footballers who played the Round of 16 at the 2010 World Cup. The research includes 52 midfield players with a mean age of 25.76 ± 3.78 and a mean height of $178.59 \text{ cm} \pm 5.84$. According to studies (Đurašković, Joksimović; Joksimović 2004) conducted with midfield footballers who played the 2002 World Cup, subject had a mean age of 27.28 ± 3.56 and a mean height value of $178.36 \text{ cm} \pm 5.55$. Studies show (Joksimović, Smajić, Molnar; Stanković 2009) that midfield players on the 2008 EURO had a mean age of 26.97 ± 3.38 with their mean height value being $179.02 \text{ cm} \pm 5.95$. The subjects covered a mean value of $10,952 \text{ m} \pm 2,123$; when their team was in possession of the ball, the midfielders covered $4,279 \text{ m} \pm 1,099$, whereas when their team was not in ball possession the subjects covered a distance of $4,485 \text{ m} \pm 1,010$. The mean sprint value the midfield footballers performed was 109.34 ± 32.72 with their mean speed be-

ing 23.54 km/h \pm 2.62. Based on the intensity of their activities, we can see that midfield players spent most of their time playing in a low intensity activity mode i.e. 80.07% \pm 3.04; subjects spent another 9.82% \pm 1.79 in a medium intensity activity mode whereas they spent 10.44% \pm 1.47

of the overall match duration in a high intensity activity mode. The midfielders had a mean successful passing rate of 36.19 \pm 17.56 and a 49.40 \pm 19.15 mean rate of unsuccessful passes.

Table 5. Central and dispersion position parameters (forward players)

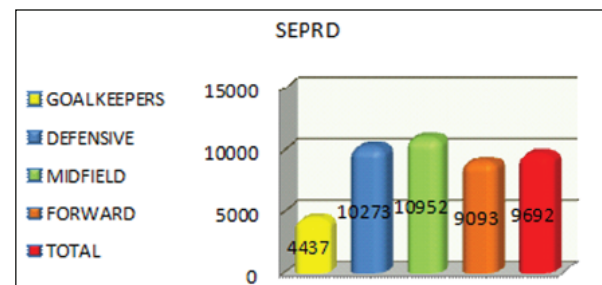
Variable	N	Range	Min.	Max.	Mean	Std.	Variance	Skew.	Kurt.
AGE	33	12.00	20.00	32.00	25.42	2.89429	8.377	.404	-.331
AVIS	33	23.00	168.00	191.00	179.12	6.38239	40.735	-.145	-1.01
SEPRD	33	7400.00	5148.00	12548.00	9093.03	1749.60	3061113.15	-.342	.201
SEPRDPL	33	3460.00	2213.00	5673.00	3744.42	748.31	559970.314	.208	.556
SEPRDBPL	33	3042.00	1896.00	4938.00	3425.39	808.79	654156.934	.057	-.367
SEBRSP	33	1040.0	54.00	158.00	100.39	28.15	792.559	.453	-.106
SEMAXB	33	12.46	19.04	31.50	24.2452	3.07793	9.474	.434	-.638
SEVANIS %	33	14.00	75.00	89.00	83.1515	3.07328	9.445	-.606	1.02
SEVASRE %	33	7.00	5.00	12.00	7.8485	1.43878	2.070	.550	1.69
SEVAVIS %	33	7.00	6.00	13.00	9.0000	1.80278	3.250	.579	.195
SEBUDO	33	37.00	4.00	41.00	19.0606	9.86769	97.371	.324	-.726
SEBND0	33	44.00	11.00	55.00	31.5758	13.07	170.939	.060	-.945

Table 5 shows the central and dispersion parameters for all forward position players who took part in the Round of 16 at the 2010 World Cup. The research includes 33 forward players with a mean age of 25.42 \pm 2.89 and a mean height of 179.12 cm \pm 6.38. According to studies (Đurašković, Joksimović; Joksimović 2004) conducted on forward position footballers who played the 2002 World Cup, the subjects aged 26.71 \pm 3.82 (mean value) and had a mean height value of 180.27 cm \pm 5.76. Studies (Joksimović, Smajić, Molnar, Stanković, 2009) conducted with forward players at the 2008 EURO show that the players have a mean age of 27.06 \pm 3.98 with their mean height being 182.60 cm \pm 6.42. The subjects covered a mean distance of 9,093 m \pm 1,749. When their team was in ball possession, forward players covered a distance of 3,744 m \pm 748, whereas when their team was not in ball possession subjects covered a distance of 3,425 m \pm 808. The mean value of sprints the forward players performed was 100.39 \pm 28.15 with the mean speed being 24.24 km/h \pm 3.07. Based on their activity intensity, we can point out that forward players spent, on average, the majority of their in-game time in low intensity activity mode i.e. 83.15% \pm 3.07; a percentage of 7.84 \pm 1.43, forward players spent in a medium intensity activity mode, whereas they spent a percentage of 9 \pm 1.80 of their overall in-game time in a high intensity activity mode. The forward players had a mean successful passing rate of 19.06 \pm 9.86 and a mean rate of unsuccessful passes of 31.57 \pm 13.07.

An arithmetic mean comparison of all footballers, position depending

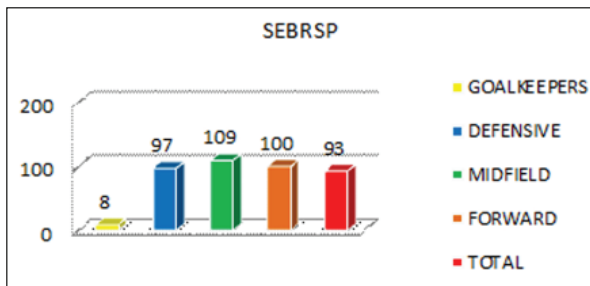
Graph 1 shows the arithmetic mean comparison of footballers in the variable *covered distance* (SEPRD). Players are divided based on the criterion of their field position. The results show that all footballers covered a distance of 9,692 m \pm 2,579. By comparing the types of players on the basis of the distance they covered in one match, it was concluded that midfield players cover the longest distance with a value of 10,952 m \pm 2,123; second are the defensive players and forward players, whereas goalkeepers cover the shortest distance.

Graph 1. Arithmetic mean comparison of field position – covered distance (SEPRD)



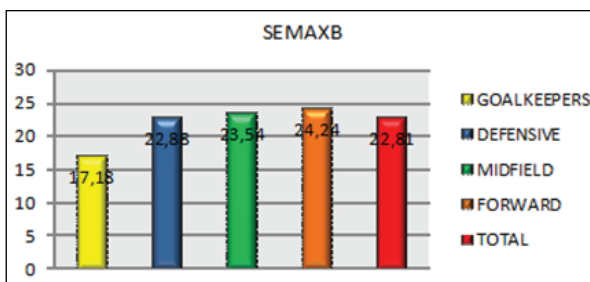
Graph 2 shows the arithmetic mean comparison of football players in the variable *number of sprints* (SEBRSP). High speed run occur, on average, each 90 seconds in a match and do not last longer than 2 to 4 seconds.

Graph 2. Arithmetic mean comparison of field positions – number of sprints (SEBRSP)



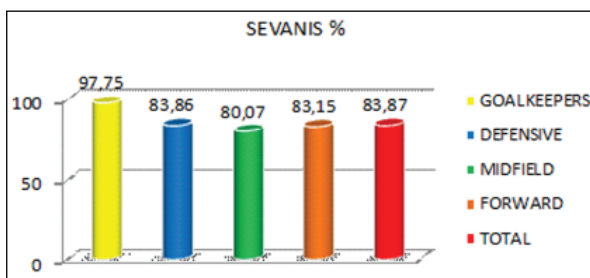
Sprint mostly occurs in combination with change of direction of movement where acceleration is even more emphasized. The distance covered in sprint depends on the footballer and the field position. Results show that the mean value of sprints of all footballers is 93.33 ± 42.87 . By comparing different types of players and their number of sprints in one match, we see that midfield players make most sprints (109.34 ± 32.72), forward and defensive players following. Goalkeepers have the lowest mean value of sprints.

Graph 3. Arithmetic mean comparison of field positions – maximum speed achieved (SEMAXB)



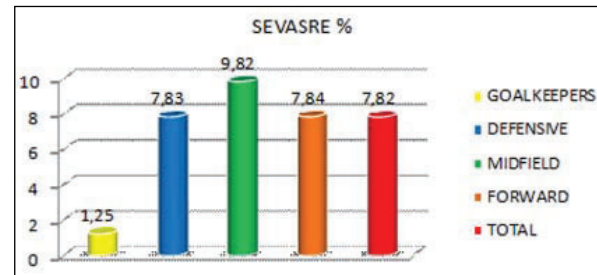
Graph 3 shows the arithmetic mean comparison of football players based on their field position and on the variable of maximum speed achieved (SEMAXB). Results show that the maximum mean speed of all footballers is $22.81 \text{ km/h} \pm 3.14$. By comparing different types of footballers on the criterion of maximum speed achieved in one match, we can conclude that the highest maximum mean speed is performed by forward players ($24.24 \text{ km/h} \pm 3.07$), midfielders and defensive players following. The lowest maximum mean speed was achieved by goalkeepers.

Graph 4. Arithmetic mean of field positions – time activity low (SEVANIS %)



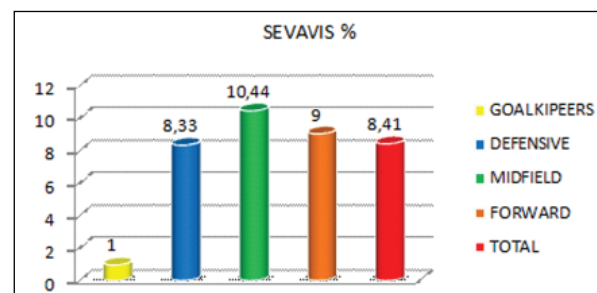
Graph 4 shows the arithmetic mean comparison of footballers based on their field position and on the variable of time activity – low (SEVANIS %). The results show that all footballers spend a majority of their time playing in a low intensity activity i.e. $83.87 \% \pm 5.58$. By comparing different types of players based on the activity intensity, it is visible that goalkeepers spend most time in low activity intensity ($97.75 \% \pm .683$), forward players and defensive ones following. Midfielders spend least in low activity intensity.

Graph 5. Arithmetic mean of field positions – time activity medium (SEVASRE %)



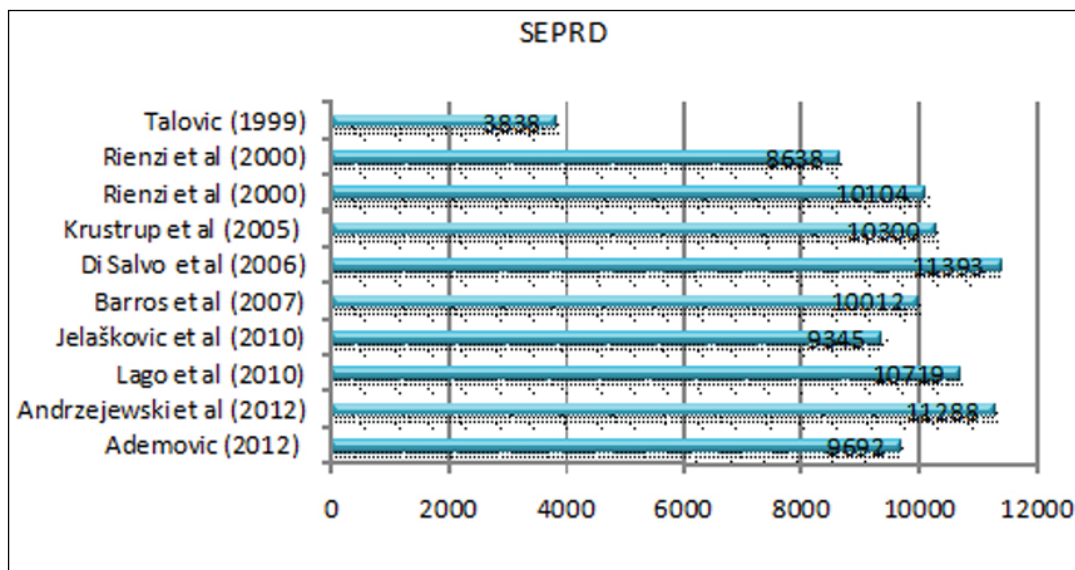
Graph 5 shows the arithmetic mean comparison of footballers based on their field position and on the variable of time activity – medium (SEVASRE %). The results show that all players spend a mean value of $7.82 \% \pm 2.73$ in medium activity intensity. Comparing different player types on the basis of the activity intensity, we can see that midfield players spend most in medium activity intensity ($9.82 \% \pm 1.79$), forward players following with $7.84 \% \pm 1.43$, a similar value of defensive players' with $7.83 \% \pm 1.31$. Goalkeepers spend least time in medium activity intensity.

Graph 6. Arithmetic mean of field positions – time activity high (SEVAVIS %)



Graph 6 shows the arithmetic mean comparison of footballers based on their field position and on the variable of time activity – high (SEVAVIS %). Results of the research show that all footballers spend a mean value of $8.41 \% \pm 3.10$ in high activity intensity. By comparing the different player types on the basis of activity intensity, it is visible that midfielders spend a mean value of $10.44 \% \pm 1.47$ in high activity intensity, forward players and defensive ones following. Goalkeepers spend least time in high activity intensity.

Graph 7. Arithmetic mean comparison on distance covered (SEPRD) according to several authors



Graph 7 shows the arithmetic mean comparison based on the distance covered (SEPRD) according to several authors. The results show that footballers, from year 2000 onward, have had approximately similar mean values in distance covered during one match. This is justified by the fact that contemporary top football demands a player of universal characteristics i.e. footballers who play equally well defensive and forward positions, however, having certain qualities: goal player, midfielder, defender, wing player etc. Therefore, contemporary football requires specialists who are capable of performing some of the above mentioned additional actions. According to the comparison of different authors' studies, B&H Premier League footballers show highest aberration rate. It is with recent studies especially that this fact is emphasized.

Conclusion

Contemporary football requires players of specific physique, players with stamina, players with significant football intelligence, controlled aggressiveness, high functional and motor abilities, team players who know how to improvise. Therefore, a precondition for engaging in professional football requires having specific skills, certain abilities and significant physical condition. All variables applied were respectively analyzed; judging by basic descriptive data (central and dispersion parameters) we can conclude that the distribution of results is within the boundaries of normal distribution. The focus of this study is the top footballer model on different field positions based on the indicators of situational efficiency in Round of 16 at the 2010 World Cup in South Africa. All results were interpreted in a way that we first showed the results of descriptive analysis for footballers on different field positions (goalkeepers, defensive players, midfielders and forward players); henceforth, the results of descriptive analysis for footballers who played the 2010 World Cup were presented. Moreover, arithme-

tic mean comparison based on player field positions were shown on some variables along with arithmetic mean comparison for footballers based on their field position according to different authors. According to the above mentioned, we can conclusively state that the results of this research were supported by central and dispersion parameters in the field of certain anthropometric characteristics (morphologic characteristics) and situational efficiency of footballers who played Round of 16 at the 2010 World Cup in South Africa.

References

- Arnason, A., Sigurdasson, SB., Gudmundsson, A. et al (2004). *Physical fitness, injuries and team performance in soccer*. *Medicine and Science of Sports Exercise*, 36, 278-285.
- Andrzejewski, M., Chmura, J., Pluta, B., Kasprzak, A. (2012). *Analysis of motor activities of professional soccer players*. *J Strength Cond Res* 26(6): 1481–1488.
- Bangsbo, J., Mohr, M., Krustup, P. (2006). *Physical and metabolic demands of training and match-play in the elite football players*. *Journal of Sports Science*, 24, 665-674.
- Barros R., Misuta., M., Menezes, R., Figueroa, P., Moura, F., Cunha, S., Anido, R., Leite, N. (2007). *Analysis of the distances covered by first division Brazilian soccer players obtained with an automatic tracking method*. *Journal of Sports Science and Medicine*, Vol. 6, 233-242.
- Bloomfield, J. i saradnici (2005). *Analysis of age, stature, body mass, BMI and quality of elite soccer players from 4 European Leagues*. *Journal of sports medicine and physical fitness*. vol. 45,58-67.

- Cigrovski, V., Kos, D., Martinčević, I. (2010). *Neke morfološke karakteristike vrhunskih nogometnih golmana*. Poreč: 19. Ljetnja škola kineziologa Hrvatske.
- Di Salvo, V., Collins, A., Mc Neill, B. and Cardinale, M. (2006). Validation of Prozone ®: A new video-based performance analysis system. *International Journal of Performance Analysis in Sport* (serial online) 6 (1), (12 screens/inclusive page), June.
- Čolakhodžić, E., Fazlagić, S., Vidović, N. (2010). *Changes in body structure of adult football players during one training unit*. Sarajevo: Homo Sporticus, vol. 12.
- Đurašković, R., Joksimović, A., Joksimović, S. (2004). Težinsko visinski pokazatelji nogometara učesnika svetskog prvenstva 2002 godine. *Physical Education and Sport* Vol. 2, No 1, 2004, pp. 13 – 24. *University of Niš, Faculty of Physical Education, Serbia*.
- Joksimović, A., Smajić, M., Molnar, S., Stanković, D. (2009). *An analysis of anthropomorphological characteristics of participants in the 2008 european football championship*. *Serbian Journal of Sports Sciences*, 3 (2): 71-79.
- Jerković, S., Jerković, M., Sporiš, G. (2006). *Spiroergometric parameters of elite soccer players. Spiroergometrijski parametri vrhunskih nogometaša*. *Hrvatski Sportskomedicinski vjesnik*. Vol. 21, pp.108-112.
- Jelašković, E., Jozak, H., Talović, M., Sporiš, G., Ramadanović, M. (2010). *Correlation between Fitness profile and situation efficiency in soccer*. *Homo Sporticus* (1512-8822), 12, 2: 11-16.
- Krustrup, P., Mohr, M., Ellingsgaard, H. and Bangsbo, J. (2005). *Physical demands during an elite female soccer game: importance of training status*. *Medicine and Science in Sports and Exercise* 37(7): 1242-1248.
- Lago, C., Casais, L., Dominguez, E., Sampaio, J. (2010). *The effects of situational variables on distance covered at various speeds in elite soccer*. *European Journal of Sport Science*, 10 (2): 103-109.
- Mohr, M., Krustrup, P., Bangsbo, J. (2003). *Match performance of highstandard soccer players with special reference to development of fatigue*. *Journal of Sports Sciences*, 21, 519-528.
- Marković, G., Bradić, A. (2008). *Nogomet – Integralni kondicijski trening*. Zagreb: Tjelesno vježbanje i zdravlje.
- E. Rienzi, B. Drust, T. Reilly, J. E. L. Carter, and A. Martin. (2000). *Investigation of anthropometric and work-rate profiles of elite South American International Soccer Players*. *Journal of Sports Medicine & Physical Fitness* 40, 162-169.
- Talović, M. (1999). *Kvalitativne promjene u strukturi kretanja igrača bez lopte u Premijer ligi BiH*. M. S. thesis. Sarajevo: Fakultet za fizičku kulturu
- Verheijen, R. (1997). *Conditioning for Soccer*. BPF, Versand, Leer.

Submitted: November, 18. 2012,
Accepted: December, 24. 2012.

Correspondence to:

Adnan Ademović

Teacher Training Faculty, Džemal Bijedić University of Mostar

URSC "Mithat Hujdur-Hujka", 88 000 Mostar

Bosnia and Herzegovina

Phone: +387 36 571-216

E-mail: aademovic@yahoo.com