

# Position-related differences in the amount, intensity and speed of movement in elite football players

<sup>1</sup> City Football Club Dinamo, Zagreb, Croatia

<sup>2</sup> 3<sup>rd</sup> Comprehensive Grammar Secondary School, Zagreb, Croatia

<sup>3</sup> Faculty of Kinesiology, University of Zagreb, Croatia

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## Abstract

The objective of this study was to determine position-related differences in the amount, intensity and speed of movement in elite football players. The variables describe the amount, intensity and speed of movement of the players when in possession of the ball, when not in the possession of the ball, and when the ball is out of play. A random selection of 150 players (30 for each playing position, goalkeepers excluded) from a population of 226 players drawn from the 32 national teams that have participated in the 2010 World Cup finals in South Africa, and have played at least 250 minutes in 3 matches. Univariate analyses of variance revealed significant positional differences in total distance covered, the greatest distance being covered by defensive midfielders (10.50 km) and offensive midfielders (10.39 km). Defensive midfielders (4.2 km) and forwards (4.0 km) covered the greatest distance when their team is in possession of the ball, and defensive midfielders (4.45 km) when their team is not in possession. When the ball is out of play there are no statistically significant differences between particular types of players. With respect to the intensity of activity, we observed that the forwards spend the most time in low intensity activities (54.01 min), defensive midfielders in the medium intensity activities (6.20 min), while the offensive midfielders spend the most time in high intensity activities (6.51). These results could be useful to coaches and performance specialists when designing position-specific training and conditioning programs.

Key words: **football, movement, playing position**

## Introduction

Football game is characterized by a multitude of tasks the players perform during a match, which is manifested through a large amount of different types of movements (walking, running, sprinting, jumping, sliding, duel, etc.). It has been, for example, established that elite football players cover over 10.5 km per match (Rampinini et al., 2007; Dellal et al., 2010), 30% of which consists of high-intensity movements (Rampinini et al., 2007; Bradley et al., 2009 and 2010). The players that are engaged more in the phase of attack create more opportunities to receive the ball and make a meaningful pass to a teammate. In the phase of defense, a greater amount of movement allows the players to create high pressure primarily on the player in possession of the ball, but on the other players as well, which prevents the opposing team from organizing their play in the phase of attack.

As a result of specific demands formed by the large dimensions of the pitch, through the development of the football game, a need for specialization of players for certain positions in the team has appeared. In previous researches, differences in the amount of movement between players that play on different positions have

## Sažetak

Osnovni cilj ovog istraživanja bio je utvrditi razlike između centralnih i bočnih defanzivnih, veznih defanzivnih i ofanzivnih igrača te napadača u varijablama koje opisuju količinu, intenzitet i brzinu kretanja nogometaša u posjedu i bez posjeda lopte te dok je lopta izvan igre. Istraživanje je provedeno na slučajno odabranom uzorku od 150 igrača (30 za svaki tip igrača) iz populacije igrača koji su odigrali najmanje 250 minuta u 3 utakmice (226 igrača) iz 32 nacionalne reprezentacije koje sudjelovale na završnici Svjetskog nogometnog prvenstva 2010. godine u Južno Afričkoj Republici. Za utvrđivanje razlika između pojedinih tipova igrača korištena je univarijantna analiza varijance, te Scheffeoov test. Usporedbom pojedinih tipova igrača u prosječno pretrčanim kilometrima tijekom jedne utakmice utvrđeno je da najviše pretrče defanzivni vezni igrači (10.50 km) i ofanzivni vezni igrači (10.39 km). Defanzivni vezni igrači (4.2 km) i napadači (4.0 km) imaju najviše prosječne vrijednosti pretrčane udaljenosti kad je ekipa u posjedu lopte, a defanzivni vezni igrači (4.45 km) kad ekipa nije u posjedu lopte. Za vrijeme kada je lopta izvan igre nema statistički značajne razlike u pretrčanoj udaljenosti između pojedinih tipova igrača. Usporedbom pojedinih tipova igrača s obzirom na intenzitet aktivnosti, moguće je uočiti da napadači najviše vremena provodu u aktivnostima niskog intenziteta (54.01 min), defanzivni vezni igrači u aktivnostima srednjeg intenziteta (6.20 min), dok u aktivnostima visokog intenziteta najviše vremena provode ofanzivni vezni igrači (6.51 min).

Ključne riječi: **nogomet, kretanje, tipovi igrača**

been established (Di Salvo et al., 2007 and 2009; Bradley et al., 2009 and 2010; Bangsbo et al. 1991; Reinzi et al. 2000; Dellal et al., 2010). Di Salvo and associates (2009) have, for example, established that in English Premier League the type of players which cover the most distance in high intensity are side backs (on average  $10.96 \pm 1.06$  km/match), while the least distance covered in high-intensity was covered by central defenders (on average  $0.68 \pm 0.13$  km/match). Aside from this, it has been established that the amount of movement differs between players that belong to different football traditions. For example, players in English Premier League cover on average  $10.1 \pm 0.7$  km/match which is significantly more than the elite South American players who cover on average  $8.64 \pm 1.16$  km/match (Reinzi et al., 2000).

Total amount of movement, or distance covered, is usually divided into activities of low, medium and high intensity (Rampinini et al., 2007; Bradley et al., 2010). In regard to movement with high intensity, we can again find differences between particular types of players. According to the research done by Bradley et al. (2009) side midfielders spend the most time engaged in high-intensity activities (on average  $3.14 \pm 0.57$  km/match), and central defenders spend the least (on average  $1.83 \pm 0.26$  km/match).

Running at maximum speed (sprinting) occurs on average every 90 seconds of the match (Reilly and Thomas, 1976) and doesn't last more than 2 to 4 seconds (Reilly and Thomas, 1976; Bangsbo, 1991). Latest research shows that 96% of sprints are shorter than 30 meters, and 49% is shorter than 10 meters (Valquer et al., 1998). Sprinting represents just 1-11% of total covered distance during a match, which is 0.5-3% of total duration of the match (Bangsbo, 1991.; Reilly and Thomas, 1976).

Despite a sizable number of previous researches that have dealt with this issue, it is noticeable that they were conducted on national leagues (England, Spain, France, the Netherlands), Champions League and UEFA Cup, and that there are certain inconsistencies in defining the particular types of players, as well as in defining the areas of intensity of activities. Therefore the real goal of this research is to establish the differences between the 5 basic types of elite players (central defenders, side backs, defensive midfielders, offensive midfielders and forwards) with variables that describe the amount, intensity, and speed of movement of the players when in possession of the ball, when not in possession of the ball and then when the ball is out of play, on a representative sample of players that have competed at World Cup 2010 in South Africa, which wasn't the case in previous researches.

## Methods

### Population and entities sample (players)

The population of entity consists of players (approx. 600) from the 32 national teams which have participated at the World Cup 2010 finals in South Africa Republic. To keep the estimate of variables reliable only the players that have played at least 250 minutes in 3 matches (226) were taken into consideration. From this pool a sample of 150 players was randomly selected (30 for each type of player: central defender, side back, defensive midfielder, offensive midfielder and forward).

### Movement variables

For every match, 7 basic and 1 derived indicator of movement were registered for each player, as well as the number of minutes and matches played. Based on this information, a matrix has been formed in which the data for each player was determined as sum results in all the matches divided with the total number of minutes played and then multiplied by 90 (the official time of a football match) - "maximum running speed" is an exception for the variable, as it has been calculated as the average value of maximal running speed in all the matches played. The basic variables which describe the movement of the players are:

- **Distance covered – team in possession of the ball** - represents the distance covered by the player while his team is in possession of the ball.
- **Distance covered – team is not in possession of the ball** – represents the distance covered by the player while his team is not in possession of the ball.
- **Distance covered – ball out of play** – represents the distance covered by the player when the ball is not longer in active play (delays, set pieces, throw-ins).
- **Maximum running speed** – represents the maximum running speed measured during the match.

- **Low intensity activity** – represents the time the player has spent in activity in which the speed of movement is less than 10km/h.
- **Medium intensity activity** - represents the time the player has spent in activity in which the speed of movement is equal to or greater than 10km/h, and less than 15 km/h.
- **High intensity activity** - represents the time which the player has spent in activity in which the speed of movement is equal to or greater than 15km/h. and a derived variable:
- **Distance covered** – represents the total distance covered. It is calculated as a simple sum of variables: distance covered when team is in possession, when team is not in possession, and when the ball is out of play.

### Statistical analyses

For all variables descriptive indicators were calculated: arithmetic mean, minimum and maximum result, standard deviation, skewness and kurtosis. Normality of the distributions of all variables was tested by the Kolmogorov-Smirnov test (K-S test). In determining the differences between particular types of players we used the univariate analysis of variance and Scheffes's test in the scope of Post-hoc technique, which is used to reduce the probability of error of type  $\alpha$  which occurs due to a high number of comparisons.

## Results and discussion

Table 1 shows that a player on average covers 9.96 km in a match, 3.85 km (39%) of which is when his team is in possession of the ball, 3.97 km (40%) while his team is not in the possession of the ball and 2.1 km (21%) when the ball is out of play. The average value of maximum running speed is 26.25 km/h, and it has ranged from the minimum of 20.96 km/h, to the maximum of 31.5 km/h. The values of kilometers covered on average are somewhat lower from the values Di Salvo and assoc. (2007 and 2009) have come up with in their research conducted on matches of Spanish La Liga, UEFA Champions League and UEFA Cup. It is possible to assume that the reasons the players on those matches scored a higher average on kilometers covered is due to the higher concentration of quality, the fact that the teams in observed matches were of similar strengths and finally that the World Cup 2010 finals were held in South Africa Republic where the climate conditions were not as favorable. Aside from that, through additional observation of Table 1, we can note that the players on average spend only 5.7 minutes (6%) engaged in high intensity activities (speed of movement  $\geq$  15km/h), 5.31 minutes (6%) in medium intensity activities (10  $\leq$  speed of movement < 15 km/h) and 52.29 minutes (58%) in low intensity activities (speed of movement < 10 km/h). In other activities, such as walking or standing, players spend on average 26.7 minutes (30%). It is also noticeable that all the variables of players' movement do not deviate in a statistically significant way from normal distribution ( $\max D > 0.11$ ), which justifies the use of univariate analysis of variance to check the set hypothesis.

Table 2 shows the results of the univariate analysis of variance and Scheffes's post-hoc test of differences between players who play primarily on the positions of offensive midfielders, central defenders, side backs and forwards in the distance covered variable.

Based on the results we can conclude there are statistically significant differences between the analyzed types of players in this variable – between the offensive and defensive midfielders

Table 1: Descriptive statistical parameters: arithmetic mean (M), minimum value (Min), maximum value (Max), standard deviation (SD) skewness (a3) and kurtosis (a4) of basic and derived variables, and KS test of normality of distribution of variables.

	M	Min	Max	SD	a3	a4	maxD
Distance covered (km)	9.96	7.80	11.93	0.81	0.06	-0.31	0.05
Distance covered with the ball (km)	3.85	2.47	5.46	0.56	0.05	-0.12	0.05
Distance covered without the ball (km)	3.97	2.66	5.46	0.56	0.10	-0.16	0.05
Distance covered with ball out of play (km)	2.14	1.53	2.91	0.26	0.18	0.01	0.04
Maximum running speed (km/h)	26.25	20.96	31.50	2.29	-0.04	-0.78	0.09
Low intensity activity (min)	52.29	44.29	60.50	3.19	-0.02	-0.48	0.05
Medium intensity activity (min)	5.31	3.20	8.33	1.08	0.61	0.05	0.08
High intensity activity (min)	5.70	3.20	8.80	1.26	0.26	-0.50	0.05

K-S-test<sub>0.05</sub> = 0.11

Table 2: Results of the univariate analysis of variance and Scheffe's post-hoc test of differences between players who primarily play the positions of: offensive midfielder, defensive midfielder, central defender, side back and forward in the variable distance covered

Distance covered (km)	F= 16.29; p=0.00				
	Arithmetic mean	Offensive midfielder	Defensive midfielder	Central defender	Side back
Offensive midfielder	10.39				
Defensive midfielder	10.50	1.00			
Central defender	9.29	0.00	0.00		
Side back	9.93	0.05	0.03	0.01	
Forward	9.68	0.00	0.00	0.29	0.75

(between which a statistically significant difference has not been established) compared to the other types of players, and between the side backs and central defenders. The results show that the midfielders cover the most distance in a match (defensive midfielders 10.50 km and offensive midfielders 10.39 km) because they cover the largest area of the pitch and because they are a link between the defensive and offensive part of the team. In the phase of attack, the main role of defensive midfielders is to position themselves diagonally behind offensive midfielders (primarily the one who is in the possession of the ball) so they can open up the option of passing backwards as a tactical device of delaying the attack, and putting themselves in a position that allows quick transformation to defense in the event that possession is lost. In the phase of defense, defensive midfielders position themselves on an imaginary line that connects the ball and the middle of the goal if the opposing team's offense is their own half or around the centre of the pitch. If the opposition's offensive line is closer to the goal they cover a part of the pitch in a zonal defense or mark a certain player individually. The amount of distance covered is also dependant of whether the team plays with one or two defensive midfielders.

Offensive midfielders differentiate from the defensive midfielders mostly in movement when the team is in possession of the ball because they have to search for the area to receive the ball, and then use the ball efficiently. The slightly shorter distance they cover can also be explained by the cooperation of the offensive midfielders with forwards in the phase of attack on an area approximately the same as the one that is covered by the two defensive midfielders.

Additionally, a statistically significant difference between the central defenders and side backs has been established. Central defenders (9.29 km) and forwards (9.68 km) have, on average,

covered less kilometers than the other types of players because they are primarily focused on playing in one phase of the game (central defenders in defense, and forwards in attack), while the side backs have a greater number of kilometers covered (9.93 km) than both the central defenders and the forwards because apart from the greater participation in the phase of defense they are also a significant presence in the phase of attack. Similar results were obtained by Di Salvo et al. (2007; 2009), with a notation that the average values of kilometers covered were slightly higher in their research.

Side backs move statistically significant more than the central defenders, and more - but not statistically significant more - than the forwards. The current trend in development of the modern football game is partially based on the side backs that cover the whole length of the field next to the throw-in line. As they are players of the last line their primary tasks are defensive in nature (they attack players from the lateral area of the pitch in a zonal defense, and participate in all the defensive actions as first or last players). They have to transform quickly from the phase of defense into an offensive player by taking their position next to the throw-in line or by running quickly into the empty space in order to open up space for another midfielder, which is not possible unless the side backs participate in the offense because that space then has to be covered by the offensive midfielder. The reason they cover less distance than the midfielders even though they are covering the entire length of the pitch is that they rarely move into the width.

Forwards, on the other hand, move over the entire width of the pitch, but not over the full length (usually just to the half of the pitch). The role of the forward is primarily based on the phase of attack so their total distance covered is lesser compared to the other players. The same goes for the central defenders, the differ-

ence being that their performance is mostly based on the phase of defense where they are positioned in a zone between the side backs, so their space for movement is greatly reduced. In the phase of attack they participate at the beginning of a continuous attack or in the transition in a combined attack. In both cases their role ends when they pass the ball to the closest midfielder and by positioning themselves at the prearranged distance from their own goal (generally not beyond the centre of the pitch). They rarely find themselves involved in the finishing stages of an attack, unless there are set-pieces which create a possibility for them to come forward and be dangerous in aerial duels.

By comparing the observed types of players in kilometers covered when their team is in the possession of the ball (Table 3), we can notice that offensive and defensive midfielders, side backs and forwards cover a statistically significant amount of kilometers than central defenders. These results are expected because the first mentioned types of players are significantly more involved in organizing the phase of attack. Apart from this, another statistically significant difference has been observed, the one between offensive midfielders (who, on average, cover the most kilometers when their team is in possession: 4.2 km) and side backs (3.77 km) while no statistically significant difference has been established between other types of players. Offensive midfielders cover the most distance when moving with the ball, which is to be expected as their role in the team is defined by moving with the ball and passing it to their teammates. Offensive midfielders are the link between the defense and attack, and their role is to take the ball from the defensive midfielders or the players in the last line of defense and transfer it to the finishing phase of an attack.

Forwards and defensive midfielders have similar results which they have achieved by different means - the forwards must react quickly and efficiently due to a constant pressure from the players in defense - the results have been drawn through a large number of contacts with the ball, while defensive midfielders have less contact with the ball, but those contacts occur in the area around the centre of the pitch where the pressure from the opposing

teams is significantly less, therefore, they can hold the ball in possession and cover a certain distance with it.

Central defenders have covered statistically significant less distance than any other type of player with the ball because they can not expose themselves to the risk of holding the ball for too long or covering a great distance with it as there are no players between them and their goal should they lose the ball. If we compare the players by the number of kilometers covered when their team is not in the possession of the ball (Table 4), it is evident that the defensive midfielders have the greatest number of kilometers covered (4.45 km). In addition, the statistically significant difference compared to all the other types of players. On the other hand, the forwards have the smallest number of kilometers covered (3.54 km) which makes them statistically significant from almost all the other types of players (statistically significant difference with the error of less than 0.05 has not been identified only between them and the central defenders, as the error in this case was less than 0.16). These results show that in the phase of defense the midfielders have the most defensive tasks because they have to close down the middle area of the pitch (the biggest part of the pitch), while the forwards participate the least in defensive duties. This variable reveals the differences in the results between two types of midfielders. The greatest distance covered while the opposing team is in possession of the ball is achieved by the defensive midfielders (4.45 km).

This happens because of the specific way their movement changes in regard to how far the ball is from the goal (they position themselves on an imaginary line that links the ball and the middle of the goal, while the opposing team's attack is in the defensive half or around the centre, and if the opposition's attack is in the attacking half they cover a part of the pitch in a zone or they mark a certain player individually). The forwards have, on average, scored the smallest values in distance covered when moving without the ball. That is because the role of a striker in the phase of defense is to find a position to optimize his movement when his team regains possession of the ball.

Table 3: Results of the univariate analysis of variance and Scheffe's post-hoc test of differences between players who primarily play the positions of: offensive midfielder, defensive midfielder, central defender, side back and forward in the variable distance covered with the ball.

Distance covered with the ball (km)	F= 12.21; p=0.00				
	Arithmetic mean	Offensive midfielder	Defensive midfielder	Central defender	Side back
Offensive midfielder	4.20				
Defensive midfielder	3.90	0.20			
Central defender	3.37	0.00	0.00		
Side back	3.77	0.02	0.91	0.04	
Forward	4.00	0.57	0.96	0.00	0.54

Table 4: Results of the univariate analysis of variance and Scheffe's post-hoc test of differences between players who primarily play the positions of: offensive midfielder, defensive midfielder, central defender, side back and forward in the variable distance covered without the ball.

Distance covered without the ball (km)	F= 14.22; p=0.00				
	Arithmetic mean	Offensive midfielder	Defensive midfielder	Central defender	Side back
Offensive midfielder	4.10				
Defensive midfielder	4.45	0.02			
Central defender	3.86	0.78	0.00		
Side back	4.00	1.00	0.01	0.87	
Forward	3.54	0.01	0.00	0.16	0.01

In distance covered when the ball is out of play no statistically significant difference between certain types of players has been found, which is in agreement with their average values that range from 2.06 km for central defenders and up to 2.18 km for offensive midfielders (Table 5). This can be explained by the fact that every player is trying to maintain optimal positioning to one another so they have to cover approximately the same distance in order to take their position in the pre-arranged formation, which is their only task in a situation when the ball is out of play.

Through observation of the variable maximum running speed (Table 6) results, we can conclude that every type of player has to have a high level of sprinting capabilities. Forwards achieve statistically significant greater speed than the defensive midfielders. Between the other types of players no statistically significant difference was established. Despite that, we can observe that offensive midfielders with 27.09 km/h and forwards with 27.37 km/h are very similar in their sprinting capabilities and are the fastest players in the team. On the other hand, the other three types of players have similar average values for maximum running speed (25.35-25.74 km/h) and they differ significantly from offensive midfielders and forwards.

Therefore it is possible to conclude that the players on these positions (offensive midfielders and forwards) have to escape the opposing team's defense with quick reactions or go around the

opponents in order to create an advantage in space and numbers. Furthermore, these types of players find it easier to achieve greater speed because they find themselves more often in a chance to operate in larger spaces. The defensive players are in general, somewhat slower due to the duels and aerial challenges they have higher body mass and height than the offensive players (Bangsbo, 2003).

The forwards achieve the fastest speed of movement because they have to react in small space with the opposing team's defense players. Speed is the crucial factor which enables them to win space for an efficient attacking action and considering they often receive the ball with their backs to the goal. Defensive midfielders have no need for quick reactions because they operate in the part of the pitch where crucial things don't take place, so the players don't have the need to move quickly. The result which shows that offensive midfielders are the second fastest type of players is very interesting. Such information points to the current trend of development of the football game where quick transition through the middle is becoming more and more important, which is the role the offensive midfielders perform.

Low intensity activity (Table 7) is characteristic for forwards and central defenders, because these two types of players have the least contact with the ball and the areas of the pitch they cover is where the game is played the least, so low intensity running is

Table 5: Results of the univariate analysis of variance and Scheffe's post-hoc test of differences between players who primarily play the positions of: offensive midfielder, defensive midfielder, central defender, side back and forward in the variable distance covered when the ball is out of play.

Distance covered when the ball is out of play (km)	F= 0.95; p=0.44				
	Arithmetic mean	Offensive midfielder	Defensive midfielder	Central defender	Side back
Offensive midfielder	2.18				
Defensive midfielder	2.15	0.99			
Central defender	2.06	0.53	0.79		
Side back	2.16	1.00	1.00	0.69	
Forward	2.15	0.99	1.00	0.77	1.00

Table 6: Results of the univariate analysis of variance and Scheffe's post-hoc test of differences between players who primarily play the positions of: offensive midfielder, defensive midfielder, central defender, side back and forward in the variable maximum running speed.

Maximum running speed (km/h)	F= 5.12; p=0.00				
	Arithmetic mean	Offensive midfielder	Defensive midfielder	Central defender	Side back
Offensive midfielder	27.09				
Defensive midfielder	25.35	0.07			
Central defender	25.69	0.24	0.98		
Side back	25.74	0.27	0.98	1.00	
Forward	27.37	0.98	0.01	0.07	0.08

Table 7: Results of the univariate analysis of variance and Scheffe's post-hoc test of differences between players who primarily play the positions of: offensive midfielder, defensive midfielder, central defender, side back and forward in the variable low intensity activity.

Low intensity activity (min)	F= 7.82; p=0.00				
	Arithmetic mean	Offensive midfielder	Defensive midfielder	Central defender	Side back
Offensive midfielder	51.44				
Defensive midfielder	50.51	0.79			
Central defender	53.71	0.09	0.00		
Side back	51.79	1.00	0.58	0.18	
Forward	54.01	0.03	0.00	1.00	0.08



sufficient for them to reach the desired position. Defensive midfielders must spend a greater amount of time in high intensity activities because that enables them to position themselves better for the actions that take place in their area of operation – and as the game is played in their area for the greater part of the match they spend less time engaged in low intensity activities.

In contrast to the low intensity activities, defensive (6.20 min) and offensive midfielders (5.75 min), because of the specialty of their position and their activity in a large area of the pitch, spend the most time in medium intensity activities. That is why in this variable a statistically significant difference has been established between the offensive midfielders compared to the central defenders and forwards, and defensive midfielders compared to all the other types of players, except the offensive midfielders (table 8). Medium intensity activities are the most prominent characteristic of midfielders because only with such activities can they fulfill all the tasks in the large area of the pitch they cover, and at the same time divide their energy rationally for the entire duration of the match.

In the high intensity activity variable (Table 9), statistically significant differences were noted between the central defenders compared to all other types of players, and between forwards compared to all midfielders who, because of the specialty of their position and their role in the game (creating the finishing stages of an attack), spend the most time engaged in high intensity activities (offensive midfielders with 6.51 min, and defensive midfielders with 6.27 min). Unlike them, the central defenders, on average, spend the least amount of time engaged in high intensity activities (4.51 min). High intensity activities occur with every direct confrontation with the opponent when fighting for the ball. As the midfielders have the most of such activities, both in defense and in attack, their score being the highest in this variable was to be expected. Central defenders have the most duels that are short lived, until the ball is cleared or the game is stopped - and this only in the phase of defense, which reflects in them spending significantly less time engaged in high intensity activities.

Table 8: Results of the Kruskal-Wallisov's test of differences between players who primarily play the positions of: offensive midfielder, defensive midfielder, central defender, side back and forward in the variable medium intensity activity.

Medium intensity activity (min)	F= 16.19; p=0.00				
	Arithmetic mean	Offensive midfielder	Defensive midfielder	Central defender	Side back
Offensive midfielder	5.75				
Defensive midfielder	6.20	0.54			
Central defender	4.65	0.00	0.00		
Side back	5.22	0.24	0.00	0.22	
Forward	4.73	0.00	0.00	1.00	0.35

Table 9: Results of the Kruskal-Wallisov's test of differences between players who primarily play the positions of: offensive midfielder, defensive midfielder, central defender, side back and forward in the variable high intensity activity.

High intensity activity (min)	F= 16.86; p=0.00				
	Arithmetic mean	Offensive midfielder	Defensive midfielder	Central defender	Side back
Offensive midfielder	6.51				
Defensive midfielder	6.27	0.90			
Central defender	4.51	0.00	0.00		
Side back	5.77	0.09	0.50	0.00	
Forward	5.45	0.00	0.05	0.02	0.84

## Conclusion

By comparing the particular types of players in average distance covered during a match, we can conclude that defensive midfielders (10.50 km) and offensive midfielders (10.39 km) cover the most distance, which is expected as they are covering the largest area of the pitch, and as they are the link between the defensive and attacking part of the team so they have tasks in both defensive phase and attacking phase of the game. If we observe the average distance covered when their team is in the possession of the ball (phase of attack), it is visible that the offensive midfielders (4.2 km) and forwards (4.0 km) have the highest average values, because once the possession of the ball is obtained the focus is to move the game towards the opponent's goal, during which the biggest role falls to the offensive midfielders and the forwards. While in the phase of defense (when their team is not in possession of the ball), on average most distance is covered by the defensive midfielders (4.45 km). During the time the ball is out of play there is no statistically significant difference in distance covered between the particular types of players. Therefore it is possible to conclude that the midfielders cover the most distance (defensive and offensive midfielders), while the central defenders and forwards on average cover a little less distance. However, the results also point to the fact that all types of players in elite football must have very high running capabilities because their average values move in the range of only 0.82 km (from 9.68 to 10.5, with average value of 9.96 km). By comparing the types of players based on the intensity of the activities during the time spent in active play, it is noticeable that the forwards spend the highest amount of time in low intensity activities (54.01 min), defensive midfielders in the medium intensity activities (6.20), while offensive midfielders spend the most time engaged in high intensity activities (6.51 min). Due to their position and their role in the system, the forwards participate less in the phase of defense than the other types of players, so the time they spend engaged in low intensity activities was to be expected. On the other hand the offensive midfielders' primary task is to create good opportunities in the final stages of an attack, which results in the highest average values in high intensity activities, while the defensive midfielders, due to the specialty of their position and a large area of the pitch they are active in, spend the most time in the medium intensity activities (6.20 min).

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Corresponding author:

**Dražan Dizdar**, PhD.

Faculty of Kinesiology, University of Zagreb,  
Horvaćanski zavoj 15, 10000 Zagreb, Croatia  
Phone: 00385992704967  
E-mail: ddizdar@kif.hr