

Analysis of motor activity of professional football team players in the Ukrainian first league

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Abstract. In this paper, the volume of high-speed motor activity of football team players in the Ukrainian First League is considered. *Objective:* The study was conducted among football team players in the Ukrainian First League in the 2017-2018 season. It was attended by 44 professional football team players in the Ukrainian First League. *Results:* The volume of motor activity of wing-backs provides for work in zones 1, 2, 4, 6, 7 and 9. Central defenders perform locomotor work mainly in zones 2 and 5. Central midfielders perform more diverse activities in 5 and 8 zones. The actions of the wing-backs provide for moving along the entire sideline in 1, 3, 4, 6 zones, as well as the wingers in 7, 9 and 10, 12 zones. Most of the time, the attack line players are in zones 8 and 11. Thus, the central defenders and wing-backs are inherent in work, which is performed mainly in the aerobic mode, the central midfielders, wingers and forwards are characterized by the performance of motor actions in the aerobic-anaerobic mode, and for the players of the line of attack compared to other roles – in the anaerobic mode. *Conclusions.* It was established that the motor actions of the central defenders per game are 8015 m (6381 m – at a slow pace, 1232 m – an average of 406 m – high), wing-backs are 9252 m (6651 m; 1712 m; 889 m, respectively), central midfielders 11261 m (7897 m; 3215 m; 1149, respectively), wingers – 10786 m (7141 m; 2575 m; 1070 m, respectively), forwards – 9799 m (5013 m; 2118 m; 2668, respectively).

Keywords: players, pace, competitive process, motor actions.

Introduction.

Relevance of the research

Modern football is a game that requires high motor activity of players and a high intensity of muscular work of a dynamic nature. Modern football is characterized by uneven physical exertion, arrhythmic alternation of work and rest. (Godick M. A., 2006; Gakame R. Z., 1995; Bangsbo J., 1994).

Motor activity of the players during the game covers a large number of motor acts that differ in structure and degree of complexity, which manifest themselves in various variants. The nature of the action with the ball during the match is determined primarily by the playing role of a football player. The number of certain actions that characterize the activity of a football player is also influenced by a number of other factors: weather conditions, the state of the field, the pace of the game, the balance of strength and capabilities of the players of opposing teams, the degree of preparedness of each athlete (Bangsbo J., Lindquist F., 1992; Golomazov S., Shinkarenko I., 1994; Lebedev S., Abdula A., Bezyasichny B., Karpets L., Shpanko T., Efremenko A. 2018).

Analysis of the latest publications.

To date, a significant amount of research has been done to study the motor activity of football players in a competitive activity, which resulted in data on the nature and scope of players' actions with and without the ball. Hence, the control of competitive activity is carried out in two main directions: the registration of physical activity and the registration of individual-command indicators of technical and tactical skill (Lebedev S., Abdula A., Bezyasichny B., Karpets L., Shpanko T., Efremenko A., 2018). Thus, the volume of movement, according to some experts (Ohashi J., Togari H., Isokava M., and Suzuki S., 1988; Ordzhonikidze Z.G. Pavlov V.I., 2008), is a very important indicator on the basis of which a running load should be planned in training. In other words, when planning a training load, it is necessary to take into account the sum of the segments that the player runs at a high and maximum speed for himself. Studies of many scientific groups (Withers R., Maricic T., Wasilewski Z. And Kelly L., 1982; Gakame R. Z., 1995) of the physical activity of football players of various qualifications

showed that between teams of different levels there are significant differences only in movement indicators with maximum intensity. Movement indicators with other speeds, less high, differ slightly. At the same time, it has been established that professional players run more distance per game than non-professionals (Mayhew S.R. and Wenger H.A.,1985). Thus, the relevance of the research topic is determined by the significant importance of information about the amount of physical activity of football players, both individual players and the team as a whole, to improve the quality of educational and training work.. **Purpose of the study was:** determine the amount of motor activity of football team players in the Ukrainian First League.

Material & methods.

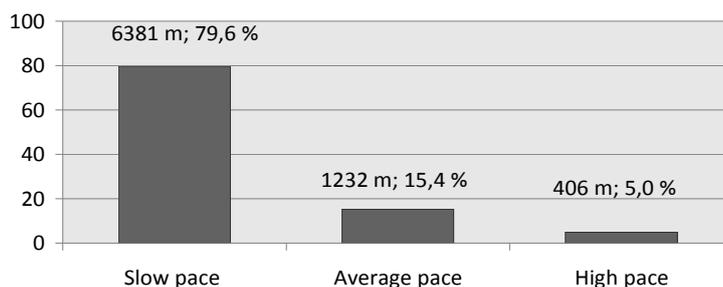
Participants. - *Objective:* The study was conducted among football team players in the Ukrainian First League in the 2017-2018 season. It was attended by 44 professional football team players in the Ukrainian First League.

Procedure. -The volume of motor activity was determined using the statistical program InStatFootball during the first and second round of the Ukrainian Championship among the teams of the Ukrainian First League of the 2017-2018 season.

Statistical data processing. Methods of mathematical statistics are used in accordance with known recommendations with the use of computer programs "EXCEL" and "SPSS" (Antomonov M. Yu., 2006, Togobitskaya G. N., Shamardin G. N., Dolbysheva N. G., 2009).

Results

Important are the physical qualities necessary for the effective execution of game actions by players of different game roles. Thus, *central defenders* overcome distances during the game: at a slow pace – 6381 m (79,6%), at an average pace - 1232 m (15,4%), and at a high pace – 406 m (5,0%). In total for the game, the motor actions are 8015 m (Figure 1).



Figure

1. The ratio of motor activity of the central defenders, %

Using the data of the statistical program InStatFootball, we divided the football field into 12 zones (Figure 2). Central defenders who perform the motor work mainly from his own penalty to the center (2 and 5 zone) and in the middle line. At the same time, given that the central defender is usually tall, his zone of action moves to the opponent's penalty area when performing standard attacking actions.

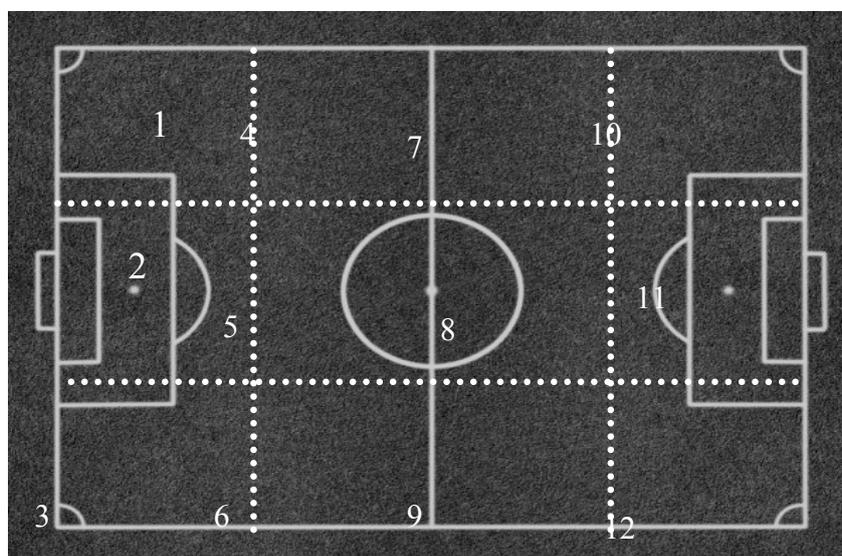


Figure 2. Footballer's movement zones

Wing-backs in taking the ball, performing medium and short and long ball passes forward, intercepting and moving are mainly carried out at a slow pace – 6651 m (71,8%), on average – 1712 m (18,5%) and the highest rate – 889 m (9,7%). Total - 9252 m per game (Figure 3).

The main feature of the motor actions of the leading wing-backs is a large amount of work, both in their own half of the field when defending (1, 2, 4, 6 zones), and when moving to the attacks of their team (7 and 9 zones).

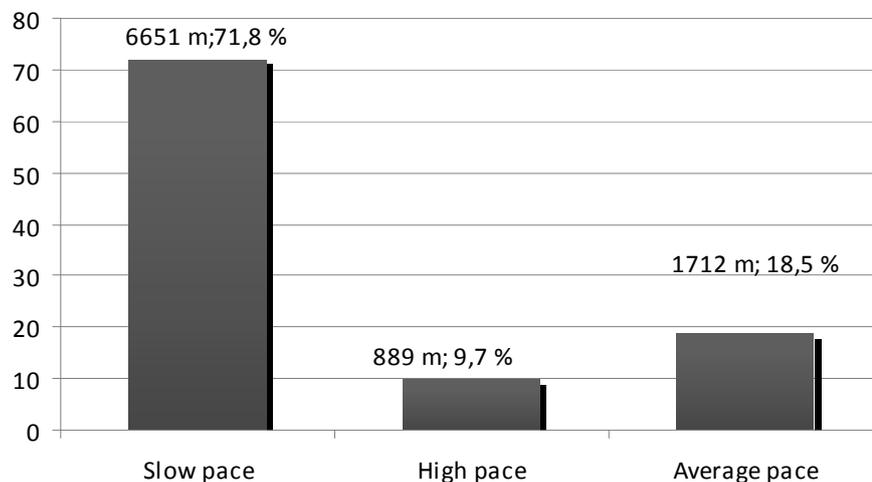


Figure 3. The ratio of motor activity of the wing-backs, %

Central midfielder, have the highest number of movements is at a slow pace – 7897 m (65,0%), while at an average pace – 3215 m (26,0%) and at a high pace – 1149 m (9,0%). The total amount of motor actions performed is – 12 261 m (Figure 4).

The central midfielders perform the most diverse actions in the fifth and eighth zones inherent in players playing this game. The area of motor action involves moving from one to another penalty area with the implementation of the entire arsenal of football technology and, as a rule, the use of all standard provisions, especially in the area of dangerous actions for the opponent.

Wingers perform heavy range of movement - 9747 m due to movements mainly in the areas: for the left wingers – 1,4,7,10; for the right wingers – 3,6,9,12 (Figure 3.12) at a slow pace – 7141 m (66,0%), on average – 2575 m (24,0%), high – 1070 (10,0%). In total, a highly qualified extreme midfielder runs an average of 10786 meters per game (Figure 5).

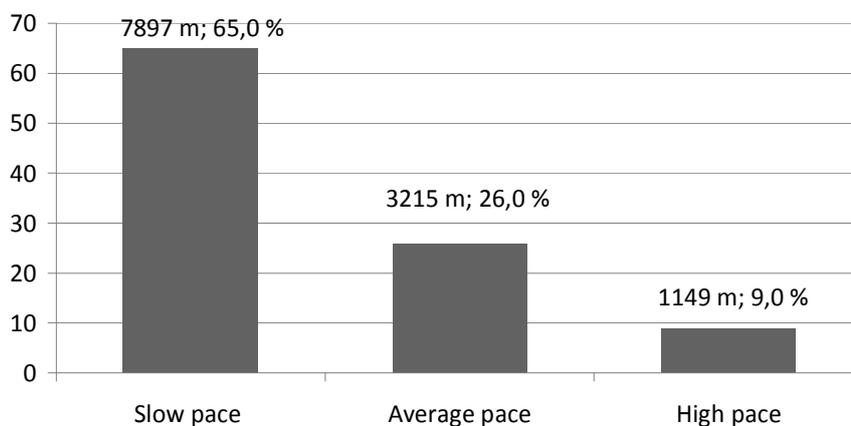


Figure 4. The ratio of motor activity of the central midfielders, %

The actions of the wing-backs provide for movement along the entire sideline, additionally fulfilling the duties of both the midfielder (if connected to the attack) (1, 3, 4, 6 zone), and the wingers (passing through the flank and passing the ball into the penalty area) (7, 9 and 10, 12 zones)

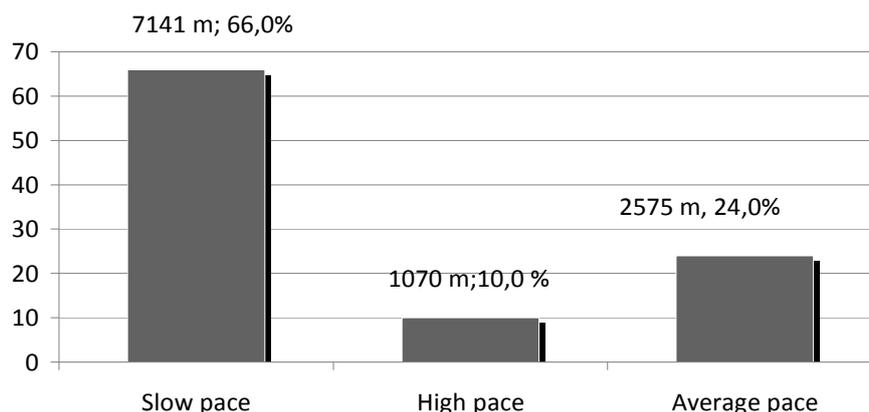


Figure 5. The ratio of motor activity of the wingers, %

Forwards carry out a smaller amount of work and the main load is aimed at finding moments for the aggravation of the game. In addition, they move at a slow pace – 5013 m (51,0%), awaiting offensive action. To a large extent, actions are carried out at an average pace – 2118 m (21,7%) and at a high pace – 2668 m (27,3%), mainly to complete the attacks, totaling 9799 m (Figure 5).

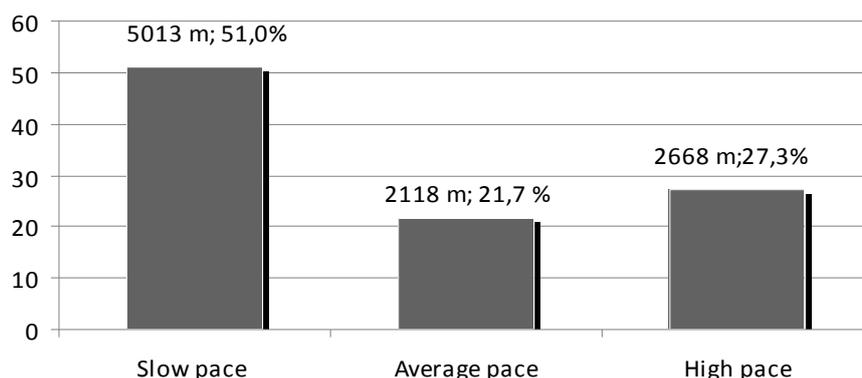


Figure 6. The ratio of motor activity of the forwards, %

The characteristic actions of the forwards are "jerks", which allow you to get rid of the tutelage of the defender and carry out relevant actions. So, the most attacking line players are in the 8th and 11th zones.

Thus, the central defenders and wing-backs are inherent in work, which is performed mainly in the aerobic mode, central midfielders, wingers and forwards are characterized by the performance of motor actions in the aerobic-anaerobic mode, and for the players of the line of attack compared to other roles – in the anaerobic mode.

Discussions. The results of our research continue the series of studies on the motor activity of professional football players (Ali A., Farally M., 1991; Mayhew S.R. and Wenger H.A., 1985). The data obtained confirm the opinion of such specialists (Gakame R. Z., 1995; Golomazov S., Shinkarenko I., 1994).

Reilly, Thomas, (1976) in his work notes that the easiest option for fixing the actions of football players is audio recording of player behavior. Further, film and video recording are actively used (cinema: Agnevik, 1970; Saltin, 1973; Van Gooletal., 1988; video: Withers et al., 1982 – 1 camera; Smaros, 1980 – 2 cameras; Bangsboetal., 1991 – 4 cameras). Innovative method was proposed by researchers from Japan (Ohashietal., 1988). Video cameras were installed near the corner flags, thanks to which the operator had the opportunity to view the recording and control the electric protractors, watching the player's movement, and then using the calculations to determine the way and speed of the player. As a result of evaluating the activity of football players, it was calculated that in one half they overcome with low speeds (from 0 to 2,5 m/s; walking, slow running) about 2-2,3 km, with average (from 2,5 to 6 m/s) – 2,3-2,8 km, with high (from 6 m/s to a maximum) 300-500 m (Reilly et al., 1976; Withersetal., 1982; Mayhewetal., 1985; Yamanaka et al., 1987; Van Gooletal., 1988; Ohashi et al., 1988; Godick M. A., 2006). On average, the total distance per match is 10-12 km. Both halves are similar to each other in terms of game activity. As the research by Yamanaka et al., (1988) shows, the total duration of movements of varying intensity showed that teams of different skill levels have significant

differences only in travel speed with maximum intensity: the university team – 104 s (b = 53 s), the major league team – 262 s (b = 28,3 s). Movement with other speeds, less high, differ by 10-20%.

So, sprint acceleration is a significant part of the game. When performing accelerations, tactical and strategic goals are decided, that is, the selection of the ball, dribble, stroke, access to free space, fight against attack, pursuit by defenders of forwards (Withers et al., 1982; Mayhew et al., 1985; Yamanaka et al., 1987; Van Gool et al., 1988; Ohashi et al., 1988). In this regard, our results confirm the importance of the development of physical qualities, as the selection trend in big football is now traced in the selection of such players who are able to compete, who can successfully resist in personal opposition and win.

Conclusions. It was determined that the motor actions of the central defenders per game are 8015 m (6381 m - at a slow pace, 1232 m – average, 406 m – high), wing-backs 9252 m (6651 m; 1712 m; 889 m, respectively), central midfielders 11261 m (7897 m; 3215 m; 1149, respectively), the wingers – 10786 m (7141 m; 2575 m; 1070 m, respectively), the forwards – 9799 m (5013 m; 2118 m; 2668, respectively).

Prospects of subsequent researches

Further studies will be aimed at determining the motor activity of the Ukrainian youth football teams.

Conflict of Interest. The authors declare that there is no conflict of interests.

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