



THE EVALUATION OF BODY-BALL COORDINATION FOR PROFESSIONAL SOCCER PLAYERS

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Abstract

The purpose of this study was to evaluate the coordination of the ball with the body of the professional soccer players. A total of 180 soccer players were examined. These soccer players are playing at the super, second (A, B) and third leagues of Turkey. The F-MARC test battery, which was designed by FIFA, is used for soccer players. The mean age, height and the body weight of the players playing in the super league were $22,53 \pm 2,78$ (years), $1,77 \pm 0,05$ (m), and $70,40 \pm 4,99$ (kg) respectively. These parameters were, $25,05 \pm 3,60$ (years), $1,79 \pm 0,05$ (m), and $74,55 \pm 5,35$ (kg) for the players playing in the 2nd division category A, $21,05 \pm 1,71$ (year), $1,80 \pm 0,03$ (m), $73,15 \pm 4,01$ (kg) for the players playing in the 2nd division category B and $22,20 \pm 2,75$ (year), $1,78 \pm 0,04$ (m) and $72,45 \pm 3,98$ (kg) for the players playing in the division 3rd. In the research, we summarized data and evaluate means, standard deviations. Anova tests have been used according to the normalcy trials. The data were evaluated and the calculated values were determined with the use of SPSS 13.0 statistics package program. There were statistically significant differences in chest-foot-head and foot-chest-head tests between the groups investigated in the study (Super league, 2nd division category A, 2nd division category B and 3rd division ($P < 0,05$)). There were statistically significant differences observed regarding to head-left foot-right foot scores which measures the coordination of the ball with the body ($P > 0,05$). The investigation of the chest-foot-head and foot-chest-head tests scores revealed that the scores of the super league players were significantly higher than the players playing in other divisions ($P < 0,05$). There were no meaningful differences observed between the other groups ($P > 0,05$).

In conclusion, professional players must be able to dominate the ball. The coordination of the ball with the body is of utmost importance and one of the primary criteria in the selection of players by the professional soccer teams.

Key Words: Soccer, Coordination, Technical, soccer player.

Introduction

Soccer, regarded as the most popular sport on the earth attracting millions of people, is a collective, fun team based and a coordinated game where the players exhibit their individual skills by the use of their muscle power (M. Günay, A. Yüce, 2001). Reaching the basic targets in soccer depends of some factors. Among these factors one of the most important one is the technique of the player (A. Lees, L. Nolan, 1998). Ball technique is the general name for the movements of the soccer player, when the ball is in his possession. These moves are either offensive to score goals which is the prime objective of the game or defensive to stop conceding goals (M. Karanfilci, 1998). Among the typical features of games such as soccer are consecutive and fast movements, short sprints, and jumps, hitting the ball in various ways, sudden change of directions, marking, distraction and fakes (A. Arnason et al. 2004, J. Bangsbo, L. Michalsik, 2002, S. Harris, T. Reilly, 1998, U. Wisloff et al. 1998). The performance in soccer is largely dependent upon the diversified use of skills. One has to practice shooting for prolonged periods. The parameters such as the speed of the ball and accuracy of the direction are directly related to the technical level of the player. Same goes for the features such as speed of the players, faking, marking, and the movements with and without the ball (A. Lees, L. Nolan, 1998). Ball control is described as the skill to stop and possess the ball in

motion. It should not be regarded solely to stop the moving ball. It is sequence of actions to stop a moving ball coming towards you and prepare it for a second action according to your position. Ball control is essential to direct a moving ball. In order to maintain the flow of the game ball control should be performed and the consecutive move should be started as quickly as possible (K. Davids et al. 2000). Ball control is made with foot (inside, outside and bottom of the foot), chest, head or different parts of the body according to the position of the ball in the game. The part of the body to be used to stop the ball is determined by the speed, height and the direction of the ball and the technique of the player. Acquiring good ball control techniques is highly dependent upon theoretical knowledge and repetitions (K. Davids et al. 2000).

The aim of this study is to evaluate the coordination of the ball with the body of professional soccer players.

Material and method

The study was carried out by the voluntary participation 32 professional players from the Turkish Super league with mean age of $22,53 \pm 2,78$ (years), mean height of $1,77 \pm 0,05$ (m) and mean weight of $70,40 \pm 4,99$ (kg), 49 soccer players with mean age of $25,05 \pm 3,60$ (years), mean height of $1,79 \pm 0,05$ (m) and mean weight of $74,55 \pm 5,35$ (kg), from the Turkish 2nd League category (A), 45 soccer players with mean age of $21,05 \pm 1,71$ (years), mean height of $1,80 \pm 0,03$ (m)

and mean weight of $73,15 \pm 4,01$ (kg) the Turkish 2nd League category (B) and 54 soccer players with mean age of $22,20 \pm 2,75$ (years), mean height of $1,78 \pm 0,04$ (m), mean weight of $72,45 \pm 3,98$ (kg) from the Turkish 3rd League. There were criteria in the selection of the players such as the positions in the game the any factor which was taken into the account was that they sustained no injury.

The test were carried out by giving an utmost attention to keep the weather conditions constant on a grass pitch under the supervision of 1 referee and 2 experts. During the tests footballs with the weight of 0,396–0,453 kg (14–16 oz), the perimeter of 0,685–0,711 meters (27–28 inches) and the pressure of 60,6–111,1 kPas (0,6–1,1 atmospheres) (Lees and Nolan 1998) were used and the distance was measured in meters. The condition of the pitch was checked by the Rösch et. al 2000).

referee prior to the tests in order to make sure that it was suitable to play on and the participants were adequately briefed about the goals of the test. The tests were started with a 30 minutes warm-up session. The F-MARC Manual Test Battery 1997 (D. Rösch et. al 2000) was employed to measure the coordination of the ball with the body developed by the FIFA.

Test protocol

Test of Playing the Ball with the Body

This test enables to evaluate the football coordination of various parts of the body. The researcher throws the ball to the player from a distance of 5 meters. The player starts to play with ball in the order of chest-foot-head, head-left foot-right foot and foot-chest-head. The researcher measures them and every successful play brings 1 point (D.



Figure 1. Juggling (body) test (D. Rösch et al. 2000).

Statistical analysis

The evaluation process was carried out with SPSS 13.0 statistics package. According to the normality examination, One – Way ANOVA parametric tests was employed for the data showing normal deviation and Kruskal Wallis H tests of non-parametric test was utilized for the data not showing normal variation. Based upon the variance homogeneity Tamhane and Tukey tests of Post Hoc Multiple Comparisons tests were used. The level of significance was taken as 0, 05.



Results

Table 1. Data summary for soccer players by their playing league.

| Variables | | | Age (years) | Height (m) | Weight (kg) |
|-----------------------------------|---------|---------|-------------|------------|-------------|
| Super League | N = 32 | Mean±Sd | 22,53±2,78 | 1,77±0,05 | 70,40±4,99 |
| 2 nd League A Division | N = 49 | Mean±Sd | 25,08±3,60 | 1,79±0,05 | 74,55±5,35 |
| 2 nd League B Division | N = 45 | Mean±Sd | 21,62±1,71 | 1,80±0,03 | 73,15±4,01 |
| 3 rd League | N = 54 | Mean±Sd | 22,20±2,75 | 1,78±0,04 | 72,45±3,98 |
| Total | N = 180 | Mean±Sd | 22,90±3,11 | 1,79±0,04 | 72,83±4,75 |

The mean age, height and weight of Super League professional soccer players were determined as 22,53±2,78 years, 1,77±0,05 (m) and 70,40±4,99 (kg) respectively. These values were found as 25,05±3,60 (years), 1,79±0,05 (m) and 74,55±5,35 (kg) for the 2nd League category A, 21,05±1,71 (years), 1,80±0,03 (m) and 73,15±4,01 (kg) for the 2nd League category B and 22,20±2,75 (years), 1,78±0,04 (m) and 72,45±3,98 (kg) for the 3rd league professional soccer players. The average age, height and the weight of the whole 180 participants were 2,90±3,11 (years), 1,79±0,04 (m) and 72,83±4,75 (kg) respectively.

Table 2. Comparison of head – left foot – right foot, chest – foot – head and foot – chest - head tests with respect to players' playing league

| variables | Groups | N | Means±SD | Chi-square | P |
|-------------------------------|----------------------------|----|-----------|------------|--------|
| Head - left foot – right foot | Super League | 32 | 2,84±0,45 | 7,090 | 0,069 |
| | 2 nd League (A) | 49 | 2,78±0,62 | | |
| | 2 nd League (B) | 45 | 2,62±0,78 | | |
| | 3 rd League | 54 | 2,50±0,80 | | |
| Chest – foot - head | Super League | 32 | 2,97±0,18 | 9,904 | 0,019* |
| | 2 nd League (A) | 49 | 2,67±0,75 | | |
| | 2 nd League (B) | 45 | 2,71±0,69 | | |
| | 3 rd League | 54 | 2,48±0,86 | | |
| Foot – chest - head | Super League | 32 | 2,88±0,34 | 16,999 | 0,001* |
| | 2 nd League (A) | 49 | 2,24±0,97 | | |
| | 2 nd League (B) | 45 | 2,09±0,95 | | |
| | 3 rd League | 54 | 2,17±0,88 | | |

P<0,05*

Examining the table there was a statistically significant difference on a %95 reliability level concerning the chest–foot–head and foot-chest-head tests among the groups investigated (Super League, 2nd League (A), 2nd League (B) and 3 League) (P<0,05). In the Head–left foot–right foot test there was no statistically significant difference noticed among the groups (P>0,05).

Table 3. Multiple comparison of Chest-Foot-Head test results with respect to players' Playing league

| (I) Groups | (J) Groups | Mean difference (I-J) | St. Error | P |
|----------------------------|----------------------------|-----------------------|-----------|--------|
| Super League | 2 nd League (A) | 0,30 | 0,16 | 0,060 |
| | 2 nd League (B) | 0,26 | 0,16 | 0,119 |
| | 3 rd League | 0,49 | 0,16 | 0,001* |
| 2 nd League (A) | Super League | -0,30 | 0,16 | 0,060 |



| | | | | |
|----------------------------|----------------------------|-------|------|--------|
| | 2 nd League (B) | -0,04 | 0,15 | 1,000 |
| | 3 rd League | 0,19 | 0,14 | 0,790 |
| 2 nd League (B) | Super League | -0,26 | 0,16 | 0,119 |
| | 2 nd League (A) | 0,04 | 0,15 | 1,000 |
| | 3 rd League | 0,23 | 0,14 | 0,612 |
| 3 rd League | Super League | -0,49 | 0,16 | 0,001* |
| | 2 nd League (A) | -0,19 | 0,14 | 0,790 |
| | 2 nd League (B) | -0,23 | 0,14 | 0,612 |

P<0,05*

As shown the table, Super League chest-foot-head test results are significantly higher than the results from the 3rd League at a %95 reliability level (P<0,05). No significant difference was found between other groups (P>0,05).

Table 4. Multiple comparison of Foot-Chest-Head Test results with respect to players' Playing league

| (I) Groups | (J) Groups | Mean difference (I-J) | St. Error | P |
|----------------------------|----------------------------|-----------------------|-----------|--------|
| Super League | 2 nd League (A) | 0,63 | 0,20 | 0,001* |
| | 2 nd League (B) | 0,79 | 0,20 | 0,000* |
| | 3 rd League | 0,71 | 0,19 | 0,000* |
| 2 nd League (A) | Super League | -0,63 | 0,20 | 0,001* |
| | 2 nd League (B) | 0,16 | 0,18 | 0,967 |
| | 3 rd League | 0,78 | 0,17 | 0,999 |
| 2 nd League (B) | Super League | -0,79 | 0,20 | 0,000* |
| | 2 nd League (A) | -0,16 | 0,18 | 0,967 |
| | 3 rd League | -0,79 | 0,17 | 0,999 |
| 3 rd League | Super League | -0,71 | 0,19 | 0,000* |
| | 2 nd League (A) | -0,78 | 0,17 | 0,999 |
| | 2 nd League (B) | 7,79 | 0,17 | 0,999 |

P<0,05*

Looking at the data on the table, the differences concerning the foot-chest-head test are statistically significant between the Super League and the 2nd League A Division, Super League and the 2nd League B Division, Super League and the 3rd League (P<0,05). The Super League measurements are significantly higher than other leagues at a %95 reliability level (P<0,05).

Discussions

Studying the chest-foot-head test results, which measure the coordination of the ball with the body the mean obtained were 2,97±0,18 for the Super League players, 2,67±0,75 for the 2nd League category A players, 2,71±0,69 for the 2nd League category B players and 2,48±0,86 for 3rd League players (Table 2). Table 2 shows that there is a statistically significant difference concerning the chest-foot-head and foot-chest-head tests among the groups examined in the study (Super League, 2nd League category A, 2nd League category B and 3rd League) (P<0,05). Super League soccer players' chest-foot-head test results are noted to be significantly higher

than those of the 3rd League players (P<0,05). No statistically significant difference is found between other groups (P>0,05). Chest-foot-head and ball coordination points' mean of high-level soccer players is 2,7±0,6. These values were found as 2,7±0,6 for 3rd League and 2,8±0,4 for amateur players (D. Rösch et al. 2000). The only statistical difference was observed between the Super League and the 3rd League soccer players. The ball playing skills of the players playing in the same league were found to be similar. Means points obtained for head-left foot-right foot test were 2,84±0,45 for the super league players, 2,78±0,62 for the 2nd league category A players, 2,62±0,78 for the 2nd league category B players and 2,50±0,80 for the 3rd league players (Table 2). There were no statistically significant differences between them (P>0,05), (Table 2). D. Rösch et al. (2000) computed the head-left foot-right foot and ball coordination points' means as 2,6±0,6, 2,6±0,6 and 2,6±0,8 points for the high-level, 3rd League and, amateur soccer players. Results in newer obtained in newer studies are in good accordance with ours. Table 2 figures indicate that



foot-chest-head test results averages in the Super League, 2nd League A division, 2nd League B division, 3rd League as 2,88±0,34, 2,24±0,97, 2,09±0,95, 2,17±0,88 points respectively. Super League measurement results are significantly higher than the other leagues ($P<0,05$). There are significant differences between the Super League and 2nd League A division, Super League and 2nd League category B division, Super League and 3rd League players ($P<0,05$). The comparison made between other between other groups does not show any difference with statistical significance ($P>0,05$), (Table 4). In another study D. Rösch et al. (2000) found the average foot-chest-head and ball coordination points for high-level, 3rd League and amateur soccer players as 1,5±1,0 and 1,7±1,0, and 1,7±1,2 points, respectively. Ball-body coordination results measured with foot-chest-head tests indicate that soccer players in our country scored higher points those of in D. Rösch et al. (2000) study showing that those Turkish footballers are more technically gifted than the ones in Europe.

Other related literatures are as follows:

Average right foot ball-playing points scored by high-level, 3rd League and amateur soccer players were determined as 24,7±1,8, and 24,1±3,5 and 22,8±4,3 respectively (D. Rösch et al. 2000). Primary, secondary and high school football competitions finalists' technical success levels were investigated with football skills tests, such as Mor and Christian (passing, shooting and "dripping") and Yeagley ("dripping", "ball bouncing", "passing with wall"). The results obtained from the winners were found to be significantly higher ($P<0,01$) than the finalist team (O. Mülazımoğlu et al. 2002). These results are in good accordance with the present study.

Conclusion

Among the tests measuring the coordination of the ball with the body, high-level soccer players are proved to be more successful in more difficult tests, whereas in easier tests, no difference is noted among professional soccer players. For any professional, to be able to play in a higher league or division, a better ball control and for high-level soccer payers, ball-body coordination is considered to be important according to this study.

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