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# THE DEPENDANCE OF ANTHROPOMETRIC MEASURES AND A SPECIFIC MOTOR TEST WITH FOOTBALL PLAYERS

## 1. INTRODUCTION

The modern football requires extensive application of scientific research. By the application of scientific methods we want to reveal which features and capabilities are most important and of which depends the success in football.

We have witnessed the evolution of the football game and on the major requirements posed by the very game, with all its elements.

The human's anthropometric measurements were used mostly by experts from the field of medicine. But these are often applied in kinesiology , as well as on athletes from different sports.

As specific motor abilities we regard on the unstandardized movements, which in football pose a particular segment of the football game.

The aim of this study is directed to determine the association between the anthropometrics' measures (as a predictor variables) and the specific motor test speed of running the ball 20 more in different directions (as a criteria variable) among football players of age 15 years.

## 2. METHODS OF WORKS

The sample of respondents in this study is composed of 63 male football players of age 15 years who regularly train. When selecting a sample of participants (players) was taken take into account to have at least two years of football experience for facilitated learning of the specific motor test.

The sample of variables covered a total number of 12 variables, of which 11 anthropometric and a specific motor variable.

***Anthropometric variables (predictors):***

1. Body height (ATV)
2. Arm length, cm (ADR)
3. Width of shoulders (ABS)
4. Diameter of the ankle (ADSZ)
5. Circumference of the forearm (AOPL)
6. Circumference of the upper arm (AONL)
7. Circumference of the leg (AOPK)
8. Body mass (ATT)
9. Skin fold of the arm (ANNL)
10. Skin fold of the thigh (ANNK)
11. Skin fold of the leg (ANPK)

**Specific motor variable (criterion)**

1. Speed of the ball's running at 20m in different directions (SM1) - as a variable.

In the statistical processing of the results were calculated the basic statistical indicators: the arithmetic means, standard deviation, minimum and maximum result, and the asymmetry of the results' distribution - skewness and roundness of the results' distribution - kurtosis.

As an assessment of the impact of the anthropometric characteristics on the specific motor players' ability was applied regression analysis, where as predictor variables were treated the variables of the anthropometric space, while as a criteria variable was treated the specific motor test - the ball's speed running at 20 m in different directions (SM1).

## 3. RESULTS

The gained results of the basic statistics are shown in Table 1, refer to the applied variables, are in expected and real limits regarding the respondents' sample.

***Table 1.*** *Basic statistical parameters of the applied variables*

| | Mean | SD | Min | Max | Skew | Kurt |
|---|---|---|---|---|---|---|
| ATV | 165.8190 | 6.30529 | 147.50 | 179.50 | -.845 | 1.330 |
| ADR | 71.9603 | 2.74470 | 65.20 | 77.10 | -.315 | -.097 |
| ABS | 35.9175 | 1.82054 | 27.50 | 39.10 | -1.566 | 6.210 |
| ADSZ | 8.6508 | .32719 | 8.10 | 9.60 | 1.040 | .774 |
| AOPL | 21.8397 | 1.43881 | 19.60 | 29.20 | 2.493 | 10.469 |
| AONL | 22.6397 | 1.42076 | 19.00 | 26.80 | .272 | .768 |
| AOPK | 32.4714 | 3.07332 | 22.60 | 37.00 | -1.764 | 3.279 |
| ATT | 52.7857 | 4.25471 | 44.00 | 63.00 | .092 | -.253 |
| ANNL | 9.3333 | 4.29178 | 3.00 | 20.00 | .938 | -.091 |
| ANNK | 11.8254 | 4.26743 | 4.00 | 22.00 | .379 | -.506 |
| ANPK | 11.0635 | 5.36077 | 5.00 | 30.00 | 1.615 | 2.656 |
| SM1 | 68.5556 | 8.86599 | 43.00 | 89.00 | -.141 | .181 |

In relation of the distribution's asymmetry of the applied variables, we can observe that the variables: width of shoulders (ABS), circumference of the forearm (AOPL), circumference of the leg (AOPK) and skin fold of the leg (ANPK), have expressed asymmetric distribution. The other applied variables are in the limits of normal asymmetry.

According to the values of kurtosis, were noted expressed deviation only at the variables: width of shoulders (ABS) and circumference of the forearm (AOPL).

From the analysis of Table 2 and the obtained results from the regression analysis, we can conclude that the anthropometric variables as a predictor system make

statistically significant influence (Sig.=.001) on the outcome of the criteria variable the ball's speed running at 20 m in different directions (SM1).

The multiple correlation coefficient (R) was .660, i.e. the correlation between the anthropometric variables and specific motor variable shows a significant association. The coefficient of determination (R square) which is .435 shows that the described variability between the system of predictors and the criteria variable is 44% of the total variability, and the remaining 56%, probably belong to other factors.

Particular (individual) impact on the speed test performance of running a ball at 20 m in different directions (SM1) have only variables: diameter of the ankle - ADSZ (Sig.=.000) and skin fold of the thigh - ANNK (Sig.=.010).

***Table 2.*** *Regression analysis of the criteria variable speed running a ball at 20 m in different directions (SM1) with the system of anthropometric variables*

| | **B** | **Std. Error** | **Beta** | **t** | **Sig.** |
|---|---|---|---|---|---|
| ATV | -.174 | .312 | -.123 | -.556 | .580 |
| ADR | .849 | .544 | .263 | 1.561 | .125 |
| ABS | .727 | .641 | .149 | 1.134 | .262 |
| ADSZ | 16.657 | 3.570 | .615 | 4.666 | .000 |
| AOPL | 1.303 | .752 | .211 | 1.733 | .089 |
| AONL | 1.374 | .965 | .220 | 1.424 | .160 |
| AOPK | .301 | .376 | .104 | .801 | .427 |
| ATT | .608 | .357 | .292 | 1.702 | .095 |
| ANNL | .268 | .431 | .130 | .621 | .537 |
| ANNK | .822 | .308 | .396 | 2.672 | .010 |
| ANPK | -.162 | .294 | -.098 | -.551 | .584 |

**R=.660 R square=.435 df(11, 51) F=3.573 Sig=.001**

## 4. CONCLUSION

Based on the obtained results from this study, can be concluded that the applied system of 11 anthropometric variables (as predictors) has a statistically significant impact on the criteria variable speed running a ball at 20 m in different directions (SM1).

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## *THE DEPENDANCE OF ANTHROPOMETRIC MEASURES AND A SPECIFIC MOTOR TEST WITH FOOTBALL PLAYERS*

*The research was conducted on 63 football players for 15 years. The aim of the research is to establish the dependence of the applied anthropometric measures and the specific motor test with players. Using the regressive analysis, there is determined statistically significant prediction of the anthropometric measures on the criteria variable.*

***Key words:*** *anthropometry, specific motoric, football players U-15, regressive analysis.*