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# Comparison of speed and power of soccer players before the preparation period and during the soccer season

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## Abstract

**Introduction**. The article discusses the importance of speed and power in football and the need for appropriate training and load monitoring to minimise risk of injury. A comparative analysis of the players' speed and power indicators before and during the season was presented, suggesting the importance of dynamic physical adaptations in the face of the demands of the competition. **Aim.** The aim of the study was to investigate whether soccer players could improve their speed and strength through soccer training in a relatively short

preparation period. **Material and methods.** The study involved 41 adult male footballers from the IV and III leagues, aged between 18 and 34, undergoing speed and power assessments. Speed was measured over a distance of 20 metres with additional measurements at 5 and 10 metres, while power was assessed by a long jump from a standing position, taking into account the stability of the landing. **Results.** Statistical analysis showed no significant differences in speed at 5 and 10 metres between terms I and II, but significant differences were observed in speed at 20 metres, where the average time decreased by 0.04 seconds. In contrast, the power test showed significant differences, increasing by 2.85 W in term II. There were no significant differences in speed and power relative to field position or correlation with age, although a weak positive correlation was observed between age and speed for 20 metres in term II and a weak negative correlation between age and the difference in the power test between terms. **Conclusion.** The analysis showed significant differences in power tests between terms, as well as differences in speed at 20 metres between defensive and offensive players. There were no significant correlations of age with test results, but a weak positive correlation was observed between age and speed at 20 metres in the 2nd term and a weak negative correlation between age and differences in the power test between terms.

**Key words:** power; soccer players; speed; training

## Introduction

In the dynamically developing world of football, where competition reaches its peak, understanding changes in the speed and power generated by players is crucial for optimal preparation of athletes and achieving success in football. A break in training reduces overall fitness and increases the risk of injury during the preparation period when the training load increases [1,2,3,4]. A modifiable factor that can therefore influence injury minimisation is properly programmed training and load monitoring and wellness [5,6,7,8,9]. From a physiotherapy perspective, this is a very important aspect due to the fact that the most common injuries in football are muscular injuries with the vast majority of injuries in the hamstring group [10,11,12,13]. An example demonstrating the relevance of this problem can be seen in an analysis from the 2016/2017 season in England's top division - on average, clubs lost around £45 million through player absence due to injury [14]. In the 2022/2023 season, the total amount of money that clubs have lost through their players' hamstring group injuries is over £70 million [11]. The same analysis reveals that the winners of the competition, Manchester City, recorded the fewest number of games missed by their players due to any injury [11]. Reducing injuries and absences from matches can give a huge advantage in achieving success at any level of the game [11,14,15,16]. The aim of the study was to show whether, in a relatively short period of time such as the preparation period, players are able to improve their speed and power through football training. The study presented here focuses on a comparative analysis of speed and power indices in football players before the team's preparation period and during the season itself, throwing light on the dynamic physical adaptations that players undergo in the face of the intensity and demands of the games.

# Materials and methods

The study involved 41 adult male football players playing in the IV and III leagues at the time of the study. The age of the participants ranged from 18 to 34 years. Each participant underwent a speed and power test.
Speed was tested by running a 20-metre distance as fast as possible from a free position with additional measurements at the 5th and 10th metres of the distance. Measurements with an accuracy of 0.001s using photocells set at a height of 50cm from the ground were used. The best results from two trials were selected for collation.
Power was tested by long jump from a standing position measured in cm. The subjects performed the test from a standing position and with an upper limb sweep. A condition for passing the test was a stabilised landing. The distance measured was from the starting line to the heel of the foot closer to the starting line. The subjects performed the test twice and the best result was taken for tabulation.

Agreement of the bioethics committee (KB 23/2024, 30.01.2024).

Statistical analyses were performed in Statistica 13 and Excel software. Results were presented as: arithmetic mean (x), standard deviation (SD) and quarter (Q1, Me, Q3) as well as minimum maximum values (min, max). The Shapiro-Wilk test was used to assess the conformity of the data distribution to a normal distribution. For statistical comparisons between groups, the Student's t test was used for dependent variables and independent variables and the Mann-Whitney test for comparisons between two subgroups. For correlation analysis, the Spearman rank correlation test was used (see Table I for interpretation).

Statistical significance was interpreted for values from the statistical test of $p<0.05$.

Tab. I. Determination of the correlation coefficient in relation to the strength of the relationship

| Correlation coefficient R | The power of a correlational relationship |
|---|---|
| 0.0 - 0.3 | Lack |
| 0.3 - 0.4 | Poor |
| 0.4 - 0.7 | Average |
| 0.7 - 0.9 | Strong |
| 0.9 - 1.0 | Very strong |

## Findings and discussion

### Characteristics of the group

A total of 41 people took part in the study, with a mean age of 25.49 years with a standard deviation of 3.796. The median age observed in the population surveyed was slightly lower than the average, at 25.00 years. This was also the result obtained by the largest number of respondents, 9. The lowest recorded age was 19.00 years and the highest 34.00 years. (Fig. 1.)

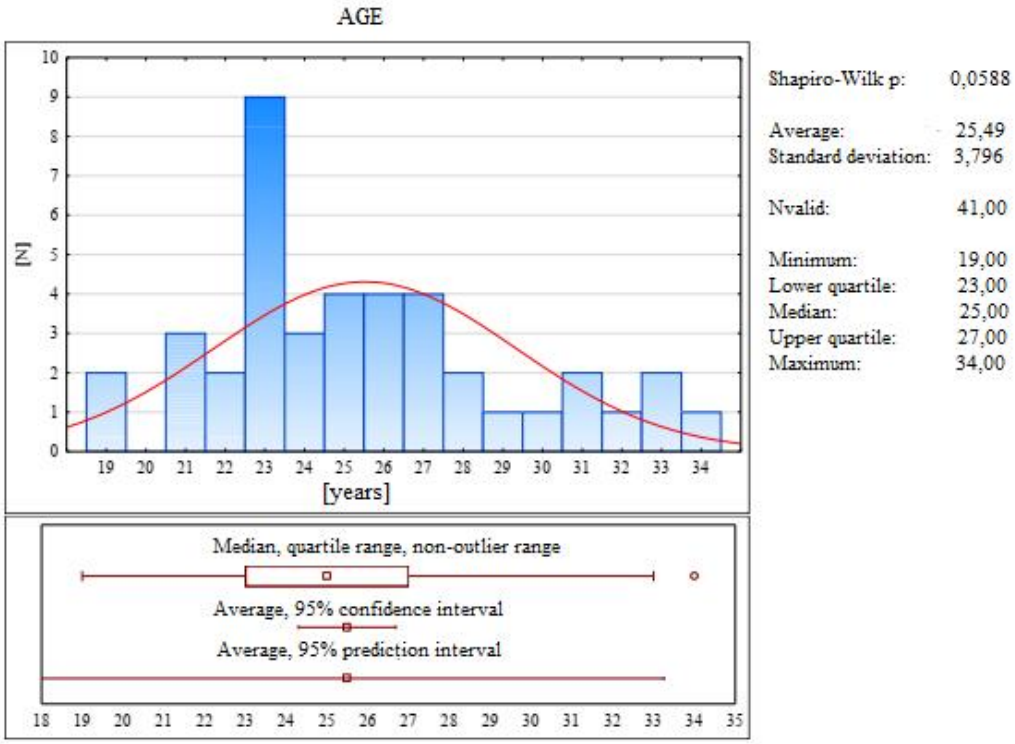


Fig. 1. Age distribution of the respondents

Respondents were asked which position they play: goalkeepers were in the minority (7.32%), and those playing in offensive and defensive positions were equally represented (46.34% each) (Fig. 2.).

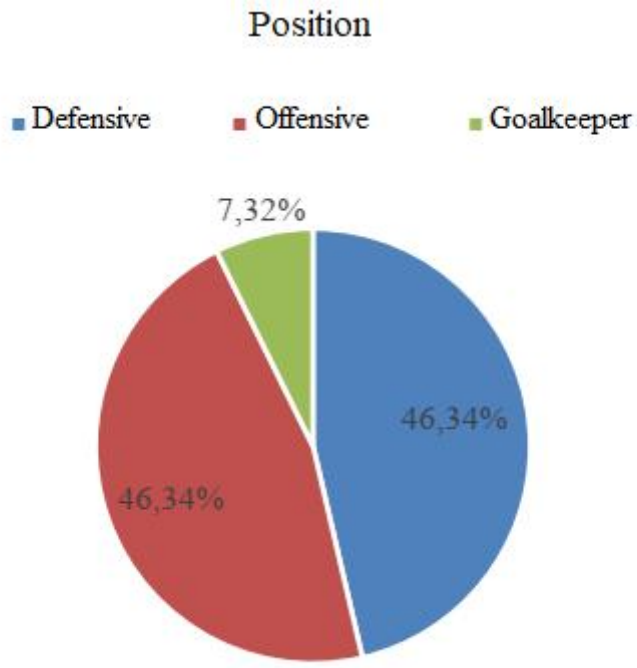


Fig. 2. Information on the position of the respondents

## Statistical analysis

### Comparison of results from the speed test

The Student's t-test was used to test whether the differences between the results of the speed test (for 5 metres) obtained at term I and term II were significantly different. Statistical analysis proved that the observed differences in values were not statistically significant, and the p-value for the test was 0.238 (Table 2., Fig. 3.).

Tab. II. Descriptive and statistical analysis of the results of the 5 meter speed test obtained in the first study and in the second study

| Survey | N | $\bar{x}$ | SD | Min | Q1 | Me | Q3 | Max | Test Result | P-value |
|---|---|---|---|---|---|---|---|---|---|---|
| FIRST TERM | 41 | 1,06 | 0,07 | 0,95 | 1,02 | 1,04 | 1,11 | 1,24 | 1,197 | 0,238 |
| SECOND TERM | 41 | 1,05 | 0,06 | 0,94 | 1,00 | 1,04 | 1,1 | 1,17 | | |
| Differences | 41 | -0,01 | 0,06 | -0,19 | -0,04 | -0,03 | 0 | 0,13 | - | |

Student's t-test for dependent variables

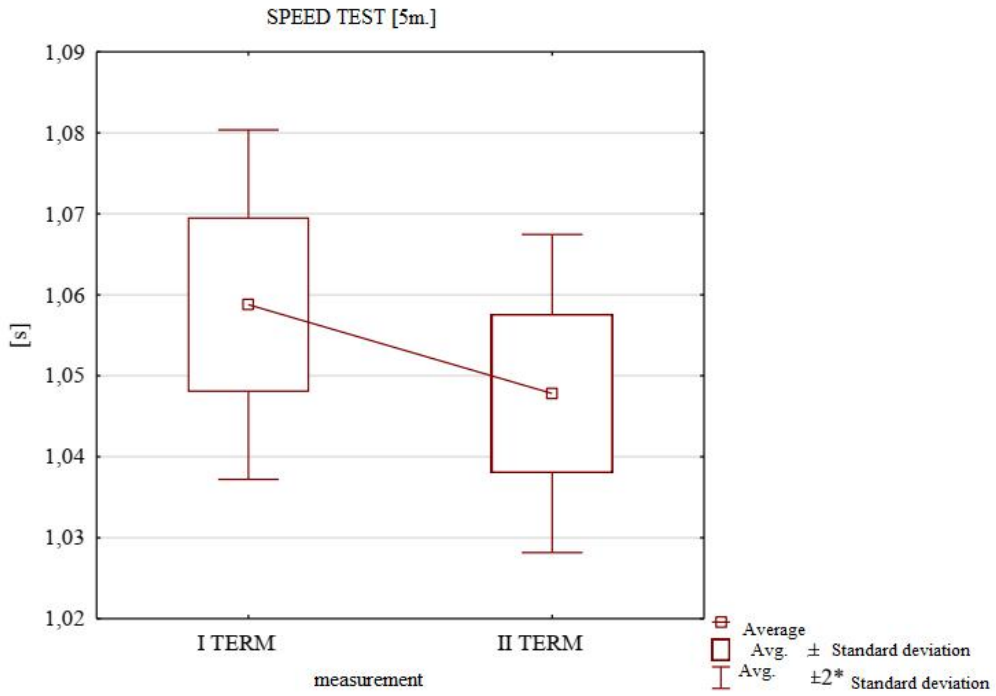


Fig. 3. Distribution of 5-meter speed test results obtained in Study I and Study II

The Student's t-test was used to test whether the differences between the results of the speed test (for 10 metres) obtained at term I and term II were significantly different. Statistical analysis proved that the observed differences in values were not statistically significant, and the p-value for the test was 0.919 (Table III., Fig. 4.).

Tab. III. Descriptive and statistical analysis of the results of the 10 meter speed test obtained in Study I and Study II

| Survey | N | $\bar{x}$ | SD | Min | Q1 | Me | Q3 | Max | Test Result | P-value |
|---|---|---|---|---|---|---|---|---|---|---|
| FIRST TERM | 41 | 1,83 | 0,07 | 1,62 | 1,79 | 1,83 | 1,88 | 1,98 | -0,103 | 0,919 |
| SECOND TERM | 41 | 1,83 | 0,06 | 1,64 | 1,8 | 1,82 | 1,86 | 2,01 | | |
| Differences | 41 | 0,00 | 0,08 | -0,09 | -0,04 | -0,02 | 0,01 | 0,27 | - | |

Student's t-test for dependent variables

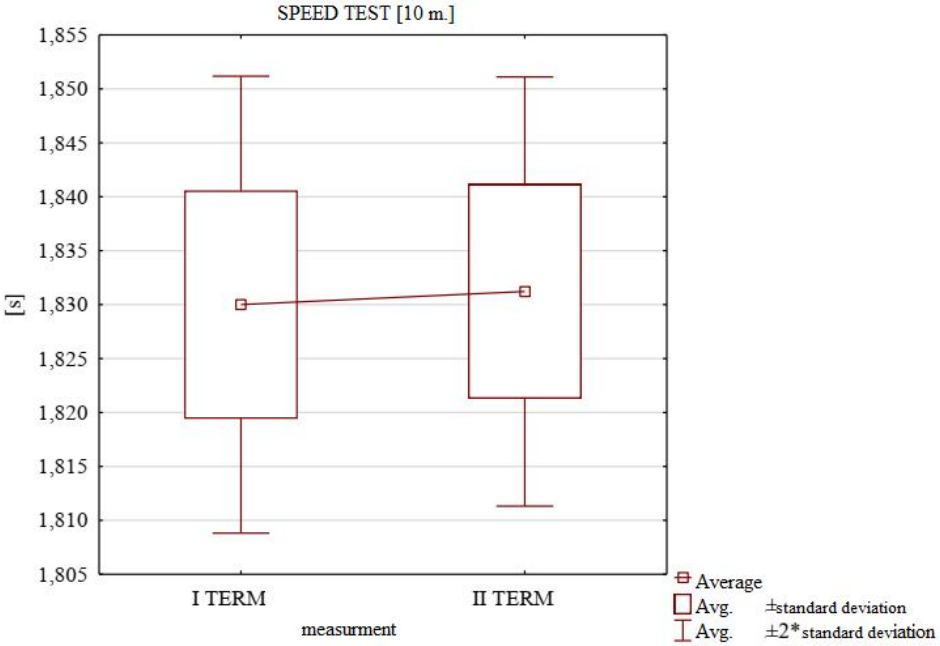


Fig. 4. Distribution of 10-meter speed test results obtained in Study I and Study II

The Student's t-test was used to test whether the differences between the results of the speed test (for 20 metres) obtained in term I and term II were significantly different. Statistical analysis proved that the observed differences in values were statistically significant, with a p-value for the test of less than 0.001. The results obtained in term II were 0.04 seconds lower than in term I, for which the mean was 3.11 seconds with a standard deviation of 0.10. Similar differences were observed in the middle (term I - 3.1 seconds vs. term II - 3.05 seconds) and maximum values (term I - 3.3 seconds vs. term II - 3.27 seconds), and the minimum values differed by 0.13 seconds (term I - 2.97 vs. term I - 2.94) (Table 4., Fig. 5.).

Tab. IV. Descriptive and statistical analysis of the results of the 20 meter speed test obtained in the first study and in the second study

| Survey | N | $\bar{x}$ | SD | Min | Q1 | Me | Q3 | Max | Test Result | P-value |
|---|---|---|---|---|---|---|---|---|---|---|
| FIRST TERM | 41 | 3,11 | 0,10 | 2,97 | 3,02 | 3,1 | 3,19 | 3,3 | 6,231 | **<0,001** |
| SECOND TERM | 41 | 3,07 | 0,09 | 2,94 | 3 | 3,05 | 3,15 | 3,27 | | |
| Differences | 41 | -0,04 | 0,04 | -0,13 | -0,06 | -0,04 | -0,02 | 0,04 | - | |

Student's t-test for dependent variables

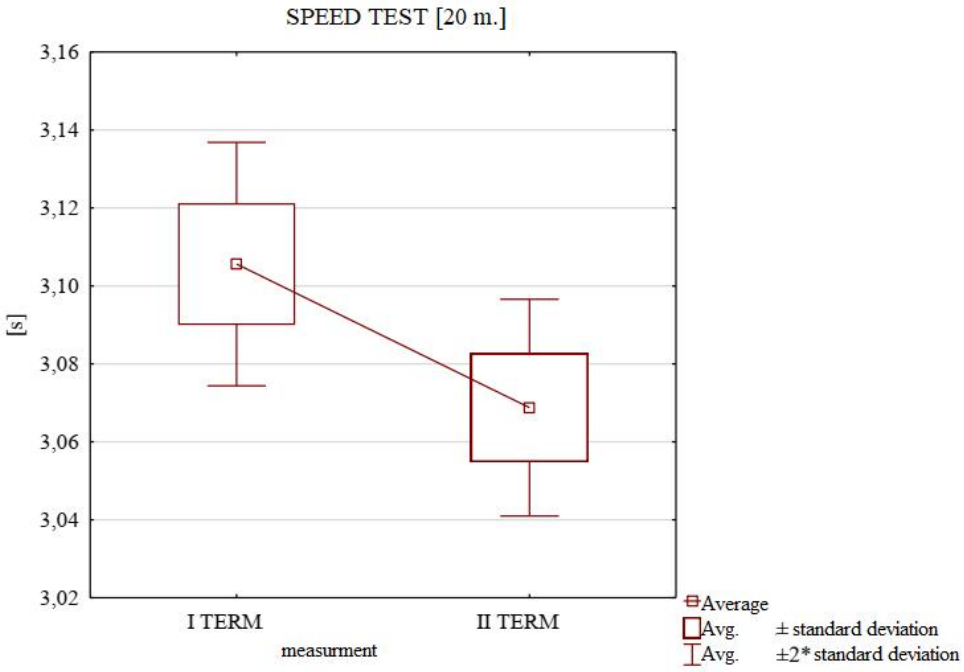


Fig. 5. Distribution of 20 meter speed test results obtained in Study I and Study II

**Comparison of power test results**

The Student's t-test was used to test whether the differences between the power test results obtained in term I and term II were significantly different. Statistical analysis proved that the observed differences in values were statistically significant, with a p-value for the test of less than 0.001. The results obtained in term II were 2.85 W higher than in term I, for which the mean was 242.56 W with a standard deviation of 9.54. Similar differences were observed in the middle values (term I - 243 W vs. term II - 264 W), slightly higher (8 W) in the maximum values (term I - 263 W s vs. term II - 264), and the minimum values differed by 5 W, with a higher minimum value observed in term II (229 W) (Table 5., Fig. 6.).

**Tab. V.** Descriptive and statistical analysis of the results of the power test obtained in the first study and in the second study

| Survey | N | $\bar{x}$ | SD | Min | Q1 | Me | Q3 | Max | Test Result | P-value |
|---|---|---|---|---|---|---|---|---|---|---|
| FIRST TERM | 41 | 242,56 | 9,54 | 226 | 235 | 243 | 250 | 263 | -5,889 | **<0,001** |
| SECOND TERM | 41 | 245,41 | 9,52 | 229 | 237 | 246 | 254 | 264 | | |
| Differences | 41 | 2,85 | 3,10 | -5 | 1 | 3 | 5 | 8 | - | |

Student's t-test for dependent variables

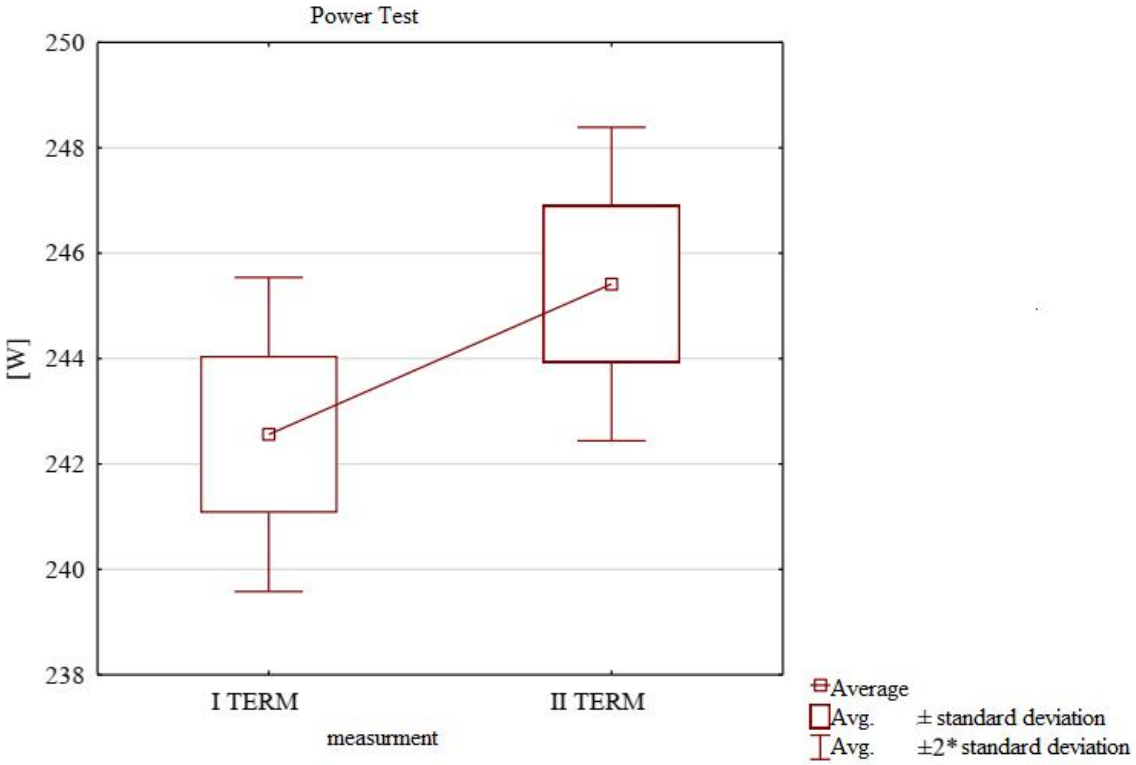


Fig. 6. Distribution of power test results obtained in Study I and Study II

**Comparison of speed test results in relation to field position**

The Mann Whitney test was used to check whether the differences between the results of the speed test (for 5 metres) obtained in the first term were significantly different depending on the respondent's position on the pitch. Statistical analysis proved that the observed differences in values were not statistically significant, and the p-value for the test was 0.053 (Table 6., Fig. 7.).

The Student's t-test was used to test whether the differences between the results of the speed test (for 10 metres) obtained in the first term are significantly different depending on the position the respondent occupies on the field. Statistical analysis proved that the observed differences in values were not statistically significant, and the p-value for the test was 0.142 (Table 6., Fig. 7.).
The Mann Whitney test was used to check whether the differences between the results of the speed test (for 20 metres) obtained in the first term were significantly different depending on the position the respondent occupies on the pitch. Statistical analysis proved that the observed differences in values were statistically significant, and the p-value for the test was 0.035. The results obtained by those in a defensive position were higher (mean 3.12 ± 0.09 s) than for those playing in an offensive position (mean 3.06 ± 0.08 s). Similar differences were observed in the middle values (defensive - 3.11 s vs. offensive - 3.04 s), slightly higher in the maximum values (defensive - 3.29 s vs. offensive - 3.22 s),) and the minimum values were similar defensive - 2.98 s vs. offensive - 2.97 s), (Table VI., Fig. 7.).

Tab. VI. Descriptive and statistical analysis of the results of the 5, 10 and 20 meter speed test obtained in the first term with a division into the positions of the competitors

| Speed Test | Position | N | $\bar{x}$ | SD | Min | Q1 | Me | Q3 | Max | Test Result | P-value |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FIRST TERM | | | | | | | | | | | |
| 5m | Defensive | 19 | 1,07 | 0,06 | 0,97 | 1,02 | 1,05 | 1,12 | 1,17 | 1,931 | 0.053U |
| | Offensive | 19 | 1,03 | 0,07 | 0,95 | 0,99 | 1,03 | 1,06 | 1,24 | | |
| 10m | Defensive | 19 | 1,84 | 0,06 | 1,73 | 1,78 | 1,84 | 1,88 | 1,94 | 1,502 | 0,142 T |
| | Offensive | 19 | 1,81 | 0,06 | 1,62 | 1,78 | 1,81 | 1,84 | 1,91 | | |
| 20m | Defensive | 19 | 3,12 | 0,09 | 2,98 | 3,05 | 3,11 | 3,21 | 3,29 | 2,105 | **0.035** U |
| | Offensive | 19 | 3,06 | 0,08 | 2,97 | 2,99 | 3,04 | 3,12 | 3,22 | | |

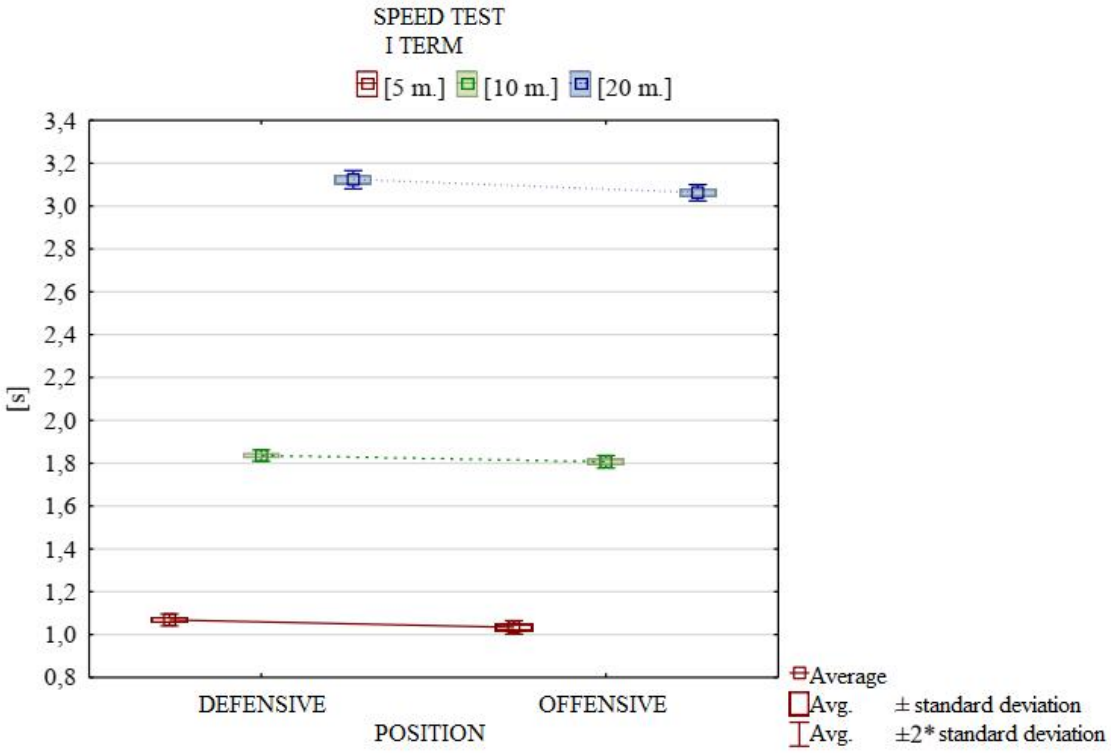


Fig. 7. Distribution of results from the speed test for 5, 10 and 20 meters obtained in the first term with a division into the positions of the competitors

The Student's t-test was used to check whether the differences between the results of the speed test (for 5 metres) obtained in the second term were significantly different depending on the position the respondent occupies on the pitch. Statistical analysis proved that the observed differences in values were not statistically significant, and the p-value for the test was 0.838 (Table 7., Fig. 8.).

It was checked with the Mann Whitney test whether the differences between the results of the speed test (for 10 metres) obtained in the 2nd term are significantly different depending on the position the respondent occupies on the field. Statistical analysis proved that the observed

differences in values were not statistically significant, and the p-value for the test was 0.977 (Table 7., Fig. 8.).

The Student's t-test was used to check whether the differences between the results of the speed test (for 20 metres) obtained in the second term were significantly different depending on the position the respondent occupies on the pitch. Statistical analysis proved that the observed differences in values were not statistically significant, and the p-value for the test was 0.060 (Table 7., Fig. 8.).

Tab. VII Descriptive and statistical analysis of the results of the 5, 10 and 20 meter speed test obtained in the second term with a division into the positions of the competitors

| Speed Test | Position | N | $\bar{x}$ | SD | Min | Q1 | Me | Q3 | Max | Test Result | P-value |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SECOND TERM | | | | | | | | | | | |
| 5m | Defensive | 19 | 1,04 | 0,06 | 0,94 | 1 | 1,05 | 1,1 | 1,12 | 0,207 | 0,838 T |
| | Offensive | 19 | 1,04 | 0,07 | 0,95 | 0,99 | 1,03 | 1,1 | 1,17 | | |
| 10m | Defensive | 19 | 1,82 | 0,06 | 1,64 | 1,8 | 1,82 | 1,85 | 1,9 | 0,029 | 0.977 U |
| | Offensive | 19 | 1,83 | 0,06 | 1,74 | 1,79 | 1,82 | 1,86 | 2,01 | | |
| 20m | Defensive | 19 | 3,08 | 0,08 | 2,95 | 3,02 | 3,1 | 3,15 | 3,2 | 1,940 | 0,060 T |
| | Offensive | 19 | 3,03 | 0,07 | 2,94 | 2,99 | 3,02 | 3,06 | 3,17 | | |

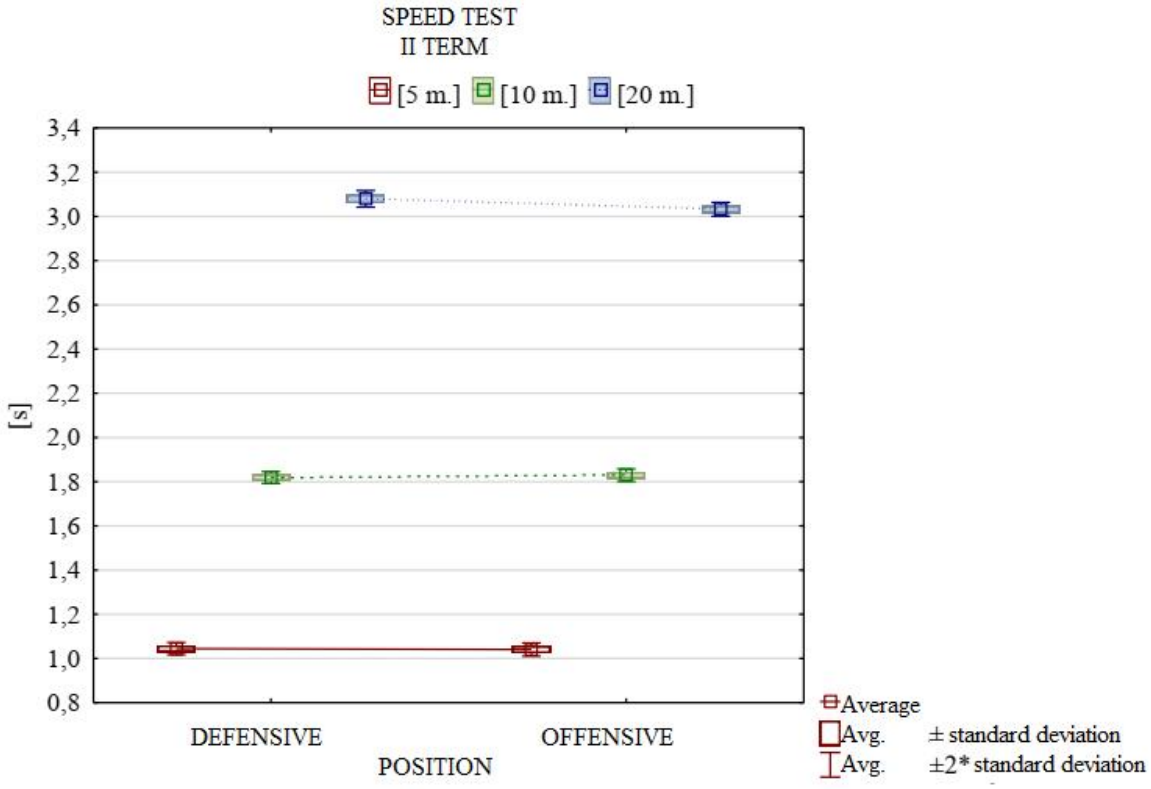


Fig. 8. Distribution of the results from the speed test for 5, 10 and 20 meters obtained in the second term with a division into the positions of the competitors

It was checked with the Mann Whitney test whether the differences between the results of the speed test (for 5 metres) obtained in the 1st and 2nd term were significantly different depending on the position the respondent occupies on the pitch. Statistical analysis proved that the observed differences in values were not statistically significant and the p-value for the test was 0.071(Table VIII., Fig. 9.). It was checked with the Mann Whitney test whether the differences between the results of the speed test (for 10 metres) obtained in the 1st and 2nd term are significantly different depending on the position the respondent occupies on the field. Statistical analysis proved that the observed differences in values were statistically significant, with a p-value for the test of 0.035. The differences observed in the group of people playing in a defensive position were -0.02 ± 0.06 s, while in the group of people in an offensive position, the mean value was 0.02 ± 0.09 s). Also, the median differences were different in both groups (defensive -0.04 s vs. offensive -0.01), slightly larger differences were present in the minimum values (defensive -0.09 s vs. offensive -0.05 and maximum values (defensive 0.14 s vs. offensive 0.27) (Table VIII., Fig. 9.).
The Student's t-test was used to test whether the differences between the results of the speed test (for 20 metres) obtained in the first and second term were significantly different depending on the position the respondent occupies on the pitch. Statistical analysis proved that the observed differences in values were not statistically significant, and the p-value for the test was 0.286 (Table VIII., Fig. 9.).

Tab. VIII. Descriptive and statistical analysis of the results of the speed test at 5, 10 and 20 meters of differences between the first and second term with a division into the positions of the competitors

| Speed Test | Position | N | $\bar{x}$ | SD | Min | Q1 | Me | Q3 | Max | Test Result | P-value |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Differences between Term I and Term II | | | | | | | | | | | |
| 5m | Defensive | 19 | -0,02 | 0,04 | -0,08 | -0,05 | -0,03 | -0,01 | 0,06 | -1,804 | 0.071 U |
| | Offensive | 19 | 0,01 | 0,07 | -0,19 | -0,03 | -0,01 | 0,04 | 0,13 | | |
| 10m | Defensive | 19 | -0,02 | 0,06 | -0,09 | -0,05 | -0,04 | -0,01 | 0,14 | -2,106 | **0.035** U |
| | Offensive | 19 | 0,02 | 0,09 | -0,05 | -0,03 | -0,01 | 0,02 | 0,27 | | |
| 20m | Defensive | 19 | -0,04 | 0,04 | -0,12 | -0,06 | -0,04 | -0,02 | 0,02 | -1,083 | 0,286 T |
| | Offensive | 19 | -0,03 | 0,04 | -0,13 | -0,05 | -0,04 | 0,01 | 0,04 | | |

U: Manna-Whitney's test; T: The student's test

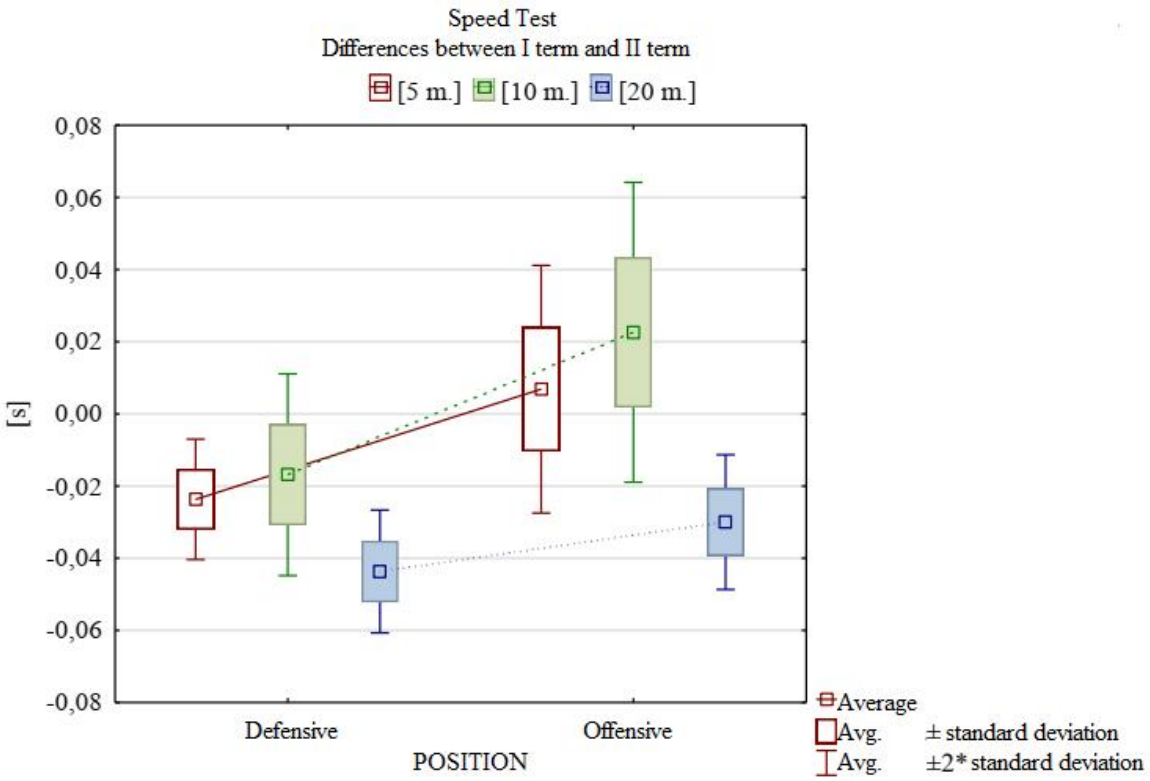


Fig. 9. Distribution of speed test results for 5, 10 and 20 meters of differences between the first and second term with a positions of the competitors

**Comparison of power test results in relation to field position**

The Student's t-test was used to check whether the differences between the results of the power test obtained in the first term are significantly different depending on the position of the respondent on the field. Statistical analysis showed that the observed differences in values were not statistically significant, and the p-value for the test was 0.895 (Fig. 10).

The Student's t-test was used to check whether the differences between the results of the power test obtained in the second term are significantly different depending on the position of the respondent on the field. Statistical analysis showed that the observed differences in values were not statistically significant, and the p-value for the test was 0.634 (Fig. 10).

The Student's t-test was used to check whether the differences between the results of the power test speed test obtained in the first and second term are significantly different depending on the position of the respondent on the field. Statistical analysis showed that the observed differences in values were not statistically significant, and the p-value for the test was 0.279 (Fig. 11).

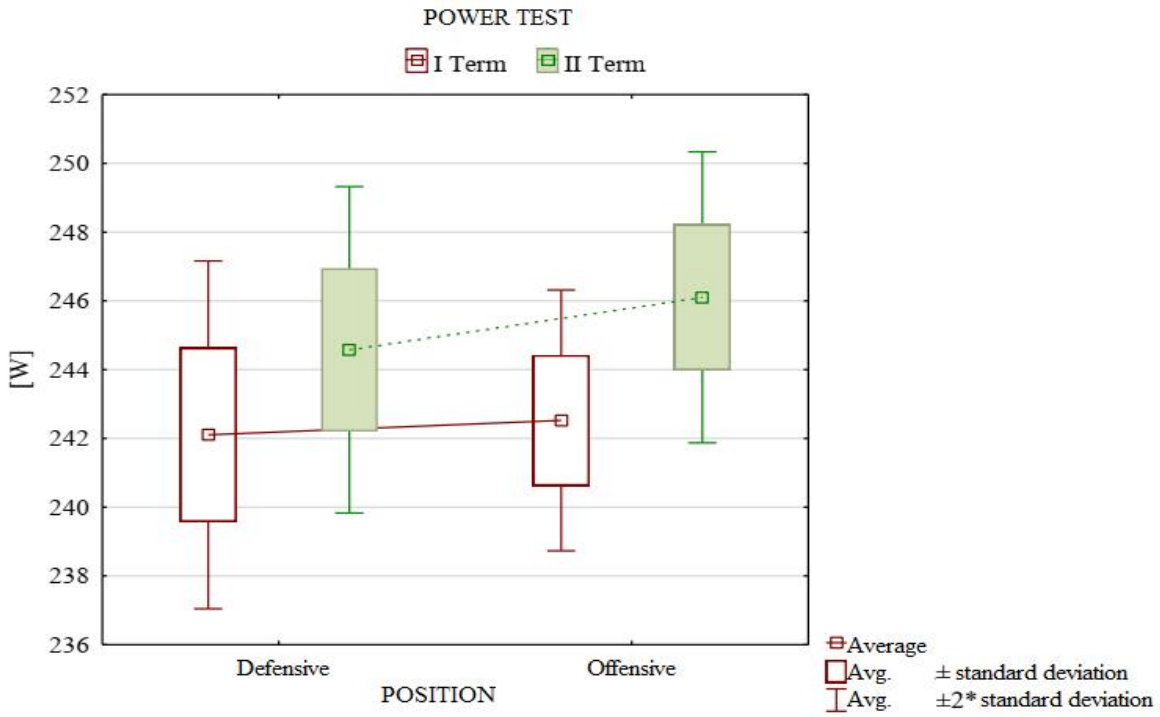


Fig. 10. Distribution of power test results obtained in the first and second term with a positions of the competitors

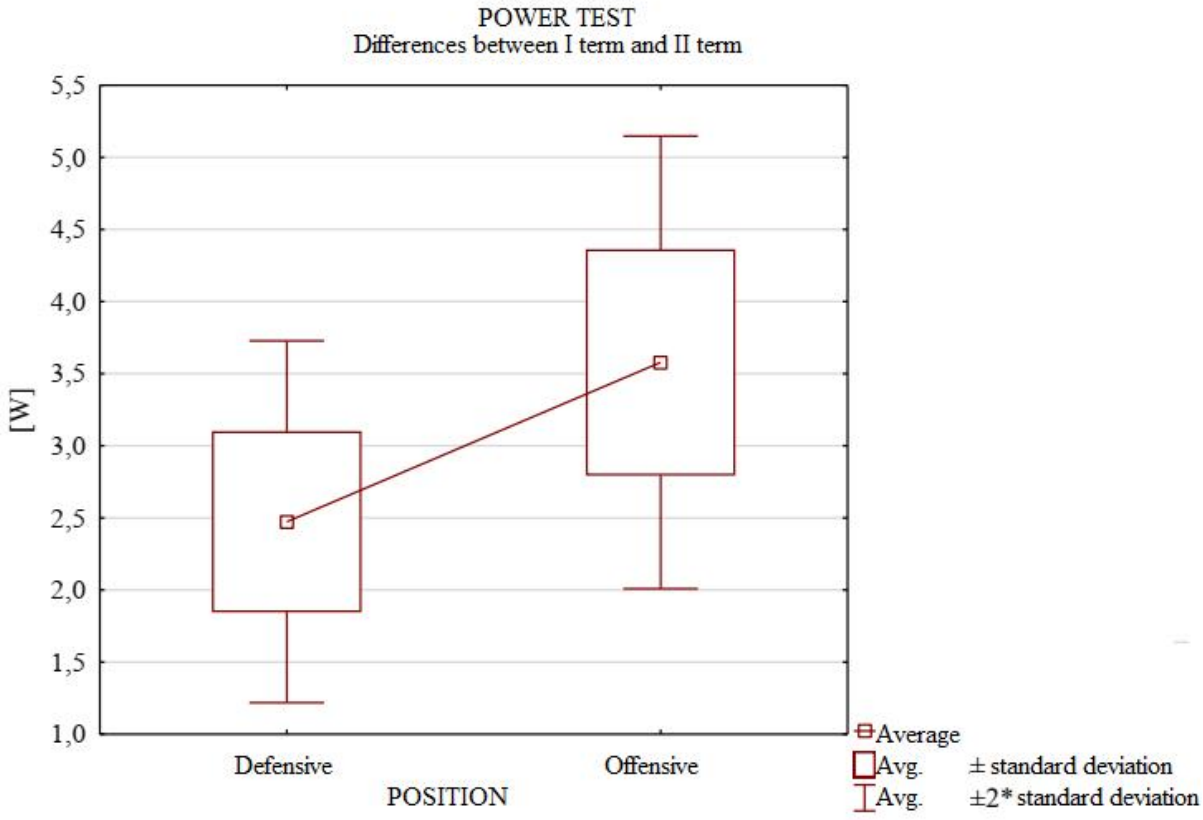


Fig. 11. Distribution of the results of the differences between the first and second term for the Power test by the positions of the competitors

**Analysis of correlation of results with age**

A Spearman rank-sum test was also used to see if there was a correlation between the results obtained from the individual speed tests (5, 10 and 20 metres) in the first term and the age of the respondents. Similarly, an analysis was carried out using the same test to see if there was a correlation between the results obtained from the power test in the first term and the age of the respondents. Statistical analysis showed that there was no statistically significant correlation between the variables tested in any of the cases. And the p-values for the tests were over 0.050 (Table IX.)

In addition, a Spearman rank-sum test was used to see if there was a correlation between the results obtained from the individual speed tests (5, 10 and 20 metres) in the second term and the age of the respondents. Similarly, an analysis was performed using the same test to see if there was a correlation between the results obtained from the power test in the second term and the age of the respondents. Statistical analysis showed that a statistically significant correlation existed only in one of the cases studied, and the p-values for the other variables were above 0.050. However, a significant ($p=0.039$) weak positive correlation was observed between the results of the 20-metre speed test and age ($R>0$, $R=0.324$) (Table IX., Fig. 12.).

In addition, a Spearman rank-sum test was used to see if there was a correlation between the magnitude of the differences from the individual speed tests (at 5, 10 and 20 metres) between the first and second dates and the age of the respondents. Similarly, an analysis was performed using the same test to see if there was a correlation between the magnitude of differences from the power test between the 1st and 2nd terms and the age of the respondents. Statistical analysis showed that a statistically significant correlation existed in only one of the cases studied, and the p-values for the other variables were above 0.050. However, a significant ($p=0.038$) weak negative correlation was observed between the magnitude of differences in the power test between the 1st and 2nd dates and age ($R<0$, $R=-0.326$) (Table IX., Fig. 13.).

Tab. IX. Analysis of the correlation of the results between the age of the examined subjects and the results from the speed and power test obtained in the first and second term and the size of the differences between the dates

| A pair of variables | Multiplicity N | Correlation Indicator R | Test Result t(N-2) | Value p |
|---|---|---|---|---|
| FIRST TERM | | | | |
| SPEED TEST [5 m.] | 41 | 0,210 | 1,342 | 0,187 |
| SPEED TEST [10 m.] | 41 | 0,015 | 0,093 | 0,926 |
| SPEED TEST [20 m.] | 41 | 0,292 | 1,908 | 0,064 |
| POWER TEST | 41 | 0,020 | 0,124 | 0,902 |
| SECOND TERM | | | | |
| SPEED TEST [5 m.] | 41 | 0,210 | 1,339 | 0,188 |
| SPEED TEST [10 m.] | 41 | 0,252 | 1,624 | 0,112 |
| SPEED TEST [20 m.] | 41 | 0,324 | 2,136 | 0,039 |
| POWER TEST | 41 | -0,068 | -0,428 | 0,671 |
| Differences between Term I and Term II | | | | |
| SPEED TEST [5 m.] | 41 | -0,071 | -0,446 | 0,658 |
| SPEED TEST [10 m.] | 41 | 0,259 | 1,673 | 0,102 |
| SPEED TEST [20 m.] | 41 | -0,087 | -0,544 | 0,589 |
| POWER TEST | 41 | -0,326 | -2,151 | 0,038 |

Spearman's Rank Correlation Test

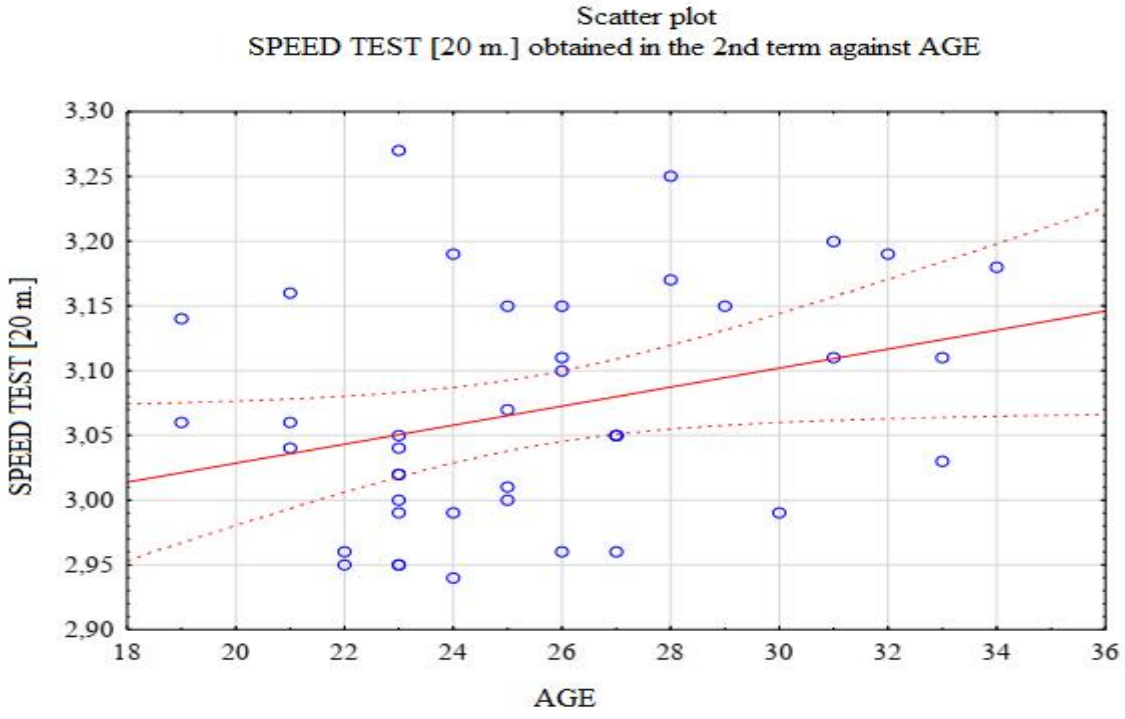


Fig. 12. Scatter plot from the 20-meter speed test obtained in the second term in relation to the age of the subjects

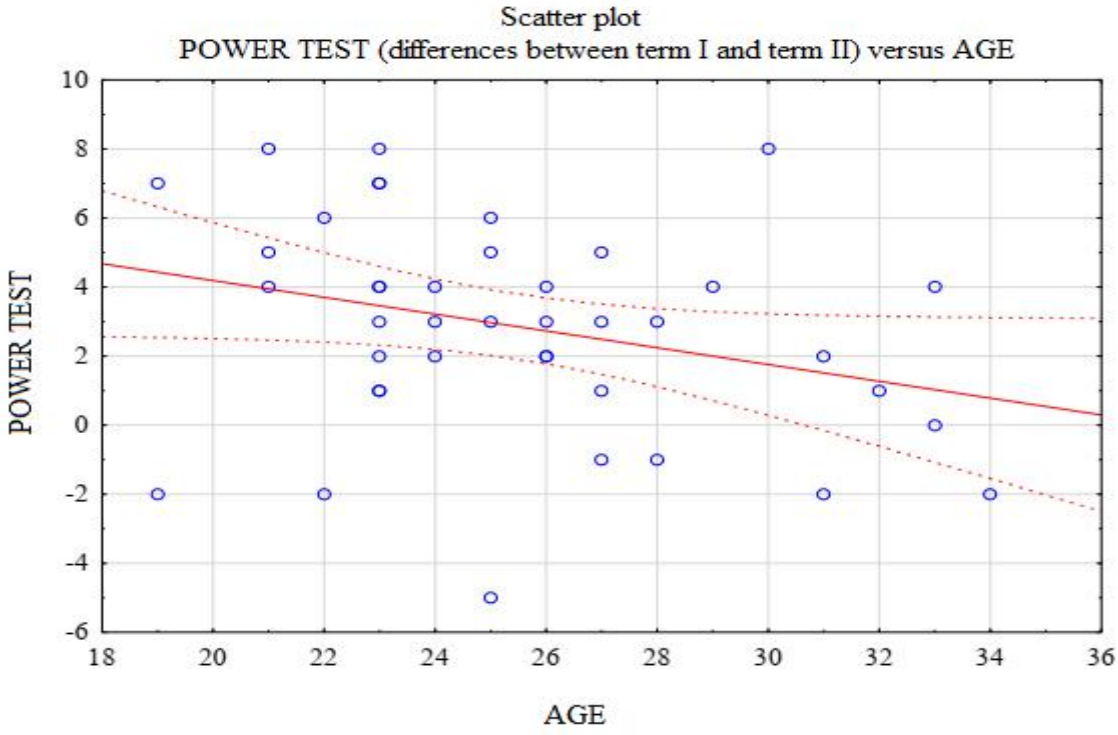


Fig. 13. Scatter plot between term I and II for the Power test correlated with the age of the subjects

**DISCUSSION**

Differences in results between positions on the field: The existence of statistically significant differences in 20-metre speed test results between defensive and offensive positions may be due to the different physical demands of these playing positions (17,18). Clear differences in peak age can also be seen when comparing age trends by position. Previous research has shown that forwards peak at around 25 years of age, defenders at 27, and midfielders somewhere in between. [19] Predictors of sporting performance related to age and player type are common in professional sport. [20] No correlation of age with performance: The lack of a statistically significant correlation of age with speed and power test results suggests that age is not a key factor influencing these physical abilities in the study group. However, the existence of a weak positive correlation between age and the 20-metre speed test in term II may indicate some age-related changes that may affect physical abilities. Improvements in performance can be achieved by an athlete at any age with regular training. Maximum speed decreases with age, but its highest results are recorded at 24-28 years of age - which is when most football players reach their sporting maximum. [19,21]. Influence of field position on speed test results: Differences in speed test results between positions on the field may suggest the need to take into account the specificity of training depending on the position occupied by the player. (18,22,23,24). Potential implications for practice: The finding of significant differences in power and speed tests between the different study dates indicates the need for regular monitoring and adaptation of training according to the changing needs of athletes. (8,22,25,26). Limitations of the study: However, limitations of the study, such as the small number of subjects and the lack of long-term follow-up, should be taken into account, which may affect the overall reliability of the results. Additionally, it is necessary to take into account other potential factors influencing test results, such as diet or activity levels outside of training. (9,27). Finding the 'golden mean' between training adaptations, performance and rest

is a major challenge. Nutrition plays an important role in this process, along with training and match load management and other strategies to improve performance and recovery. [9,27]

## CONCLUSIONS

Analysis of age and position on the pitch: There was age diversity in the study group, but the mean age was close to the median age. No statistically significant age differences were observed according to position on the pitch.
Comparison of speed test results: The results of the 5, 10 and 20 metre speed tests showed no statistically significant differences between the 1st and 2nd terms of the study. However, there were statistically significant differences in the times for the 20-metre speed test between the defensive and offensive position groups, where the defensive players scored better.
Comparison of power test results: There were statistically significant differences in the results of the power test between the 1st and 2nd terms of the study. The results of the power test in the 2nd term were higher compared to the 1st term. There were no statistically significant differences in the power test between the group of people playing in different positions on the field.
Correlation analysis: No statistically significant correlations were observed between the age of the subjects and the results of the speed and power tests obtained at the 1st and 2nd testing dates. However, a significant weak positive correlation was observed between age and the results of the 20-metre speed test at term II. In addition, there was a significant weak negative correlation between age and differences in the power test between term I and term II.
It is recommended that a follow-up study be conducted on a larger group of subjects over a longer period of time with fatigue markers examined to ensure that the athletes tested were at a similar level of physical fatigue.

**Author's contribution:**

Conceptualization, Mariusz Miłek and Radosław Perkowski.

Methodology Mariusz Miłek and Radosław Perkowski.

Software: Mariusz Miłek.

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All authors have read and agreed with the published version of the manuscript.

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Non

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