EXPLOSIVE POWER, SPEED, AND AGILITY PERFORMANCE IN YOUNG FOOTBALL PLAYERS: NORMATIVE TABLES FOR SPORT EDUCATION AND TRAINING MANAGEMENT IN TURKEY

POTÊNCIA EXPLOSIVA, VELOCIDADE E AGILIDADE EM JOVENS JOGADORES DE FUTEBOL: TABELAS NORMATIVAS PARA A EDUCAÇÃO ESPORTIVA E A GESTÃO DO TREINAMENTO NA TURQUIA

POTENCIA EXPLOSIVA, VELOCIDAD Y AGILIDAD EN JÓVENES FUTBOLISTAS: TABLAS NORMATIVAS PARA LA EDUCACIÓN DEPORTIVA Y LA GESTIÓN DEL ENTRENAMIENTO EN TURQUÍA

Nurettin Ersin UZUN[1]
e-mail: ersyn_9@hotmail.com

İlker KİRİŞCİ[2]
e-mail: ilker.kirisci@marmara.edu.tr

Meltem ÖZAĞIR[3]
e-mail: mozagir@gelisim.edu.tr

Sevinç Serin YAMAN[4]
e-mail: seserin@gelisim.edu.tr

Tuba KIZILET TOPATEŞ[5]
e-mail: tuba.kizilet@marmara.edu.tr

How to reference this paper:

Uzun, N. E., Kirişci, İ, Özağır, M., Yaman, S. S., & Kızılet Topateş, T. (2026). Explosive power, speed, and agility performance in young football players: normative tables for sport education and training management in Turkey. *Revista on line de Política e Gestão Educacional*, *30*(esp2), e026069. https://doi.org/10.22633/rpge.v30iesp2.21350

| **Submitted**: 02/04/2026
| **Revisions required**: 23/04/2026
| **Approved**: 15/05/2026
| **Published**: 01/08/2026

Editor: Prof. Dr. Sebastião de Souza Lemes
Deputy Executive Editor: Prof. Dr. José Anderson Santos Cruz

[1] Marmara University, Istanbul – Turkey. PhD candidate, Institute of Health Sciences, Sport and Exercise Science.
[2] Marmara University, Istanbul – Turkey. Associate Professor, Faculty of Sport Sciences.
[3] Istanbul Gelisim University, İstanbul – Turkey. Assistant Professor, Faculty of Sport Sciences.
[4] Istanbul Gelisim University, İstanbul - Turkey. Assistant Professor, Faculty of Sport Sciences.
[5] Marmara University, Istanbul – Turkey. PhD, Professor, Faculty of Sport Sciences.

ABSTRACT: This study examined explosive power, speed, and agility in youth soccer players aged 15 to 18 years, highlighting normative tables as tools for sports education and training management. Grounded in formative performance assessment and youth athlete development, the study included 1,842 players from Turkish soccer clubs. Participants completed 10-m and 30-m sprint tests, the standing long jump, and the T-test. Data were analyzed using descriptive statistics, Pearson's correlation, simple linear regression, ANOVA, and percentile classifications. The findings showed that explosive power significantly predicts speed and agility performance, with progressive improvements across age groups. The results indicate that physical assessment can support pedagogical planning, individualized monitoring, and evidence-based management of youth training programs. Furthermore, standardized normative parameters can serve as diagnostic tools to reduce premature sports exclusion, promote more inclusive practices, and foster the holistic development of young athletes.

KEYWORDS: Sport education. Training management. Youth soccer players. Explosive power. Normative values.

RESUMO*: Este estudo analisou a potência explosiva, a velocidade e a agilidade em jovens jogadores de futebol de 15 a 18 anos, discutindo o uso de tabelas normativas como instrumentos para a educação esportiva e a gestão do treinamento. Fundamentado na avaliação formativa do desempenho e no desenvolvimento de jovens atletas, o estudo envolveu 1.842 jogadores de clubes turcos. Foram aplicados os testes de sprint de 10 m e 30 m, salto horizontal e teste t, com análise por estatística descritiva, correlação de Pearson, regressão linear simples, ANOVA e classificações percentuais. Os resultados demonstraram que a potência explosiva prediz significativamente o desempenho em velocidade e agilidade, com melhora progressiva ao longo das idades. Conclui-se que a avaliação física pode orientar o planejamento pedagógico, o monitoramento individualizado e a gestão baseada em evidências, contribuindo para práticas mais inclusivas, evitando a exclusão esportiva precoce e favorecendo o desenvolvimento integral dos jovens atletas.*

PALAVRAS-CHAVE*: Educação esportiva. Gestão do treinamento. Jovens jogadores de futebol. Potência explosiva. Valores normativos.*

RESUMEN*: Este estudio analizó la potencia explosiva, la velocidad y la agilidad en jóvenes futbolistas de 15 a 18 años, destacando el uso de tablas normativas como herramientas para la educación deportiva y la gestión del entrenamiento. Basado en la evaluación formativa del rendimiento y el desarrollo de jóvenes deportistas, el estudio incluyó a 1.842 jugadores de clubes turcos. Se aplicaron pruebas de sprint de 10 m y 30 m, salto horizontal y prueba T. Los datos se analizaron mediante estadística descriptiva, correlación de Pearson, regresión lineal simple, ANOVA y clasificaciones percentilares. Los resultados mostraron que la potencia explosiva predice significativamente el rendimiento en velocidad y agilidad, con una mejora progresiva entre los grupos de edad. Se concluye que la evaluación física puede orientar la planificación pedagógica, el seguimiento individualizado y la gestión basada en evidencias, favoreciendo prácticas más inclusivas, evitando la exclusión deportiva temprana y promoviendo el desarrollo integral de los jóvenes deportistas.*

PALABRAS CLAVE*: Educación deportiva. Gestión del entrenamiento. Jóvenes futbolistas. Potencia explosiva. Valores normativos.*

INTRODUCTION

Football is a team sport with high neuromuscular and mechanical demands, characterized by explosive movements such as short-term maximal sprints, rapid accelerations and decelerations, changes of direction, and jumping. In recent years, with the increasing tempo of the game and rising physical demands, performance components such as speed, agility, and explosive power have become fundamental factors determining the performance levels of youth football players (Sellami et al., 2024; Karaca & Ilkım, 2021). Accordingly, evaluating physical performance characteristics through objective testing in academy age groups is of paramount importance for long-term athlete development and talent identification processes (McAuley et al., 2024; Castro-Infantes et al., 2025).

Adolescence is a critical developmental stage where significant changes in muscle strength, lower extremity explosive power, and sprint capacity are observed due to growth and biological maturation. Particularly between the ages of 15–18, substantial individual differences emerge in speed and agility performance depending on the level of maturation (Sellami et al., 2024). In this age group, the increase in explosive power is closely associated with the development of sprint performance and change-of-direction skills—a relationship that has been strongly reported in recent studies (França et al., 2024). Short-distance sprint performance in youth footballers is considered an indicator of first-step speed and acceleration capacity, with the 10-meter sprint test being widely utilized for this purpose. Additionally, the 30-meter sprint test is preferred to evaluate maximal speed capacity. Current research reveals that sprint performance is closely related not only to running mechanics but also to lower extremity explosive power (McAuley et al., 2024; Michailidis, 2023; Şahin et al. 2025).

From the perspective of sport pedagogy, understanding these neuromuscular and maturational changes is essential for designing a safe training curriculum that meets the developmental needs of young athletes. In this context, the coach plays an important role not only in guiding athletic performance but also as an educator. Therefore, physical assessments should not be viewed as an end in themselves but as educational tools that support the teaching process, foster physical literacy, and promote Positive Youth Development (PYD). This approach enables the planning of activities that respect individual biological differences while contributing to the healthy, inclusive, and holistic development of each young athlete.

In this context, SLJ test stands out as a reliable indicator of explosive power in youth football players. Agility performance is a critical component in sports with high change-of-direction intensity, such as football. The T-test is a commonly used field test for youth footballers as it simultaneously evaluates multidirectional change of direction, braking, and re-acceleration characteristics. The current literature indicates that agility performance is not independent of speed and explosive power; rather, these performance components share a common neuromuscular foundation (França et al., 2024; Sellami et al., 2024). However, despite numerous studies investigating the relationships between speed, explosive power, and agility in youth footballers, there is a noted scarcity of age-specific normative performance tables based on large sample groups. Yet, normative values are of vital importance for the objective assessment of athletes' individual performance levels, the planning of training programs appropriate to age and developmental stages, and the grounding of talent selection processes on scientific foundations (França et al., 2024).

Although these variables are usually discussed as indicators of sport performance, in youth categories they also have an educational and management function. In organized sport education, physical tests may support formative assessment, guide the progression of training contents, identify developmental needs, and help coaches, teachers, and program managers avoid decisions based only on subjective observation or competitive results. Therefore, the use of normative tables in this study is not limited to classifying athletes, but is understood as a resource for planning, monitoring, and evaluating training processes in a pedagogically oriented manner.

This perspective is particularly relevant for football academies, school sport programs, and youth development systems, where decisions about selection, training load, and individualized support affect both performance and the broader educational trajectory of young athletes. Age-specific normative parameters may contribute to more transparent management practices, allowing performance expectations to be adjusted to developmental stages rather than applied uniformly across heterogeneous groups.

From a broader policy and educational management perspective, the development of evidence-based institutional sports guidelines can help reduce the systemic pressure for early competitive success. This approach ensures that institutions—whether mainstream schools with extracurricular sports programs or sports academies—fulfill their educational responsibility. By adopting this normative framework, administrators can establish assessment policies that help prevent exclusion and sport dropout while integrating training into a broader educational project that promotes citizenship, inclusion, and the holistic development of young athletes.

From a broader policy and educational management perspective, the development of institutional sports guidelines grounded in robust evidence can help mitigate the systemic pressure for early competitive achievement. This approach ensures that institutions—whether mainstream schools offering extracurricular sports programs or sports academies—fulfill their educational mission. By adopting this normative framework, educational leaders can implement assessment policies that help prevent exclusion and sport dropout, while embedding training within a pedagogical framework that promotes citizenship, comprehensive education, and the holistic development of young athletes.

Accordingly, the objective of this study is to examine the 10-meter and 30-meter sprint, standing long jump, and T-test agility performances of youth football players aged 15-18; to determine performance differences between age groups; to reveal the relationship between explosive power and speed/agility performances; and to establish age-specific normative performance tables based on the acquired data. By doing so, the article seeks to connect performance assessment with sport education and training management, emphasizing the use of empirical indicators for formative monitoring, pedagogical planning, and evidence-based decision-making in youth football programs.

MATERIALS AND METHODS

Young male football players from the U15, U16, U17, and U18 age categories of various clubs in Turkey participated in this study on a voluntary basis. A total of 1,842 youth footballers were included in the tests, with the following age distribution: U15 (n=457); U16 (n=425); U17 (n=448); and U18 (n=512). Prior to the study, participants were provided with detailed information regarding the study procedures, along with potential risks and discomforts. Informed consent forms and parental consent forms were read and signed by the participants and their legal guardians. Ethical approval for the study was obtained from the Istanbul Rumeli University Ethics Committee (Document No: E-53938333-050-31677).

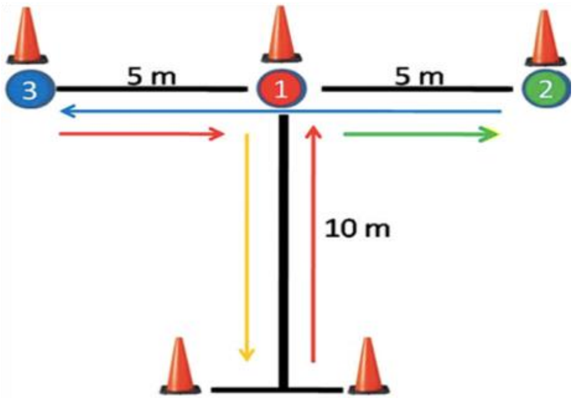
Speed tests

For the 10-meter and 30-meter speed tests, Fusion Sport Smart Speed Timing Gates photocells were positioned at the starting point, the 10th meter, and the 30th meter. A starting line was marked 1.5 meters behind the first timing gate. Participants were instructed to keep one foot in contact with the starting line and remain stationary until the “start” command was given, after which they were to sprint at their maximal speed through the exit gate. Both speed tests were performed in three repetitions. A 1-minute recovery period was provided between repetitions, and a 4-minute rest period was given between the two different tests.

Agility test

The T-test was utilized to measure the agility levels of the participants.

Figure 1.
T-Agility Test



Note. The Authors.

A Fusion Sport Smart Speed Timing Gates photocell system was positioned at the starting point, with a single gate serving for both entry and exit. A starting line was marked 1.5 meters behind the initial timing gate. Participants were instructed to keep one foot in contact with the starting line and remain stationary until the "start" command was given.

The test layout consisted of a cone (Point A) placed 10 meters directly ahead of the starting line, with two additional cones placed 5 meters to the right (Point B) and 5 meters to the left (Point C) of Point A. Upon the start command, participants were required to:

- Sprint forward to Point A and touch the cone,
- Shuffle laterally to Point B and touch the cone,
- Shuffle laterally across to Point C and touch the cone,
- Shuffle laterally back to Point A and touch the cone,
- Finally, backpedal (run backward) through the starting gate to complete the test.

The T-test was performed three times for each participant, with a 1-minute recovery period between repetitions.

Explosive power test

The Standing Long Jump (SLJ) Test was employed to evaluate the explosive power of the participants. A starting line was designated as the zero point, and a measuring tape was placed perpendicular to this line.

Participants were instructed to stand with both feet in full contact with the ground at the starting line. Upon the command, they were required to jump forward as far as possible, land on both feet, and maintain their balance in a standing position without using their hands for support on the ground. Measurements were taken from the starting line to the heel of the foot closest to the starting point at the moment of landing. Each participant was given three trials, with a 1-minute recovery period provided between attempts.

Statistical analysis

Statistical analysis of the data was performed using the SPSS 26.0 software package. Prior to the main analyses, descriptive statistics (arithmetic mean, standard deviation, minimum, and maximum values) were calculated for all variables. The normality of the data distribution was evaluated through skewness and kurtosis values; values within the range of ±2 were considered to satisfy the assumption of normal distribution.

To examine the relationships between the explosive power (standing long jump), speed (10 m and 30 m sprint), and agility (T-test) performances of the youth footballers, Pearson product-moment correlation analysis was conducted. Correlation coefficients were interpreted to determine the direction and magnitude of the relationships between variables. Simple linear regression analysis was employed to examine the predictive effect of explosive power on speed and agility performance. The significance of the regression models was evaluated using the F-test, and the level of significance was set at $p < 0.05$.

One-Way Analysis of Variance (ANOVA) was applied to determine performance differences in speed, explosive power, and agility across age groups (15, 16, 17, and 18 years). For variables where significant differences were detected in ANOVA results, appropriate post-hoc multiple comparison tests were used to identify the specific groups from which the differences originated. Effect sizes were reported to evaluate the practical significance of the differences between age groups.

Additionally, normative values for 10-meter speed, 30-meter speed, standing long jump, and T-test agility performances were established for football players aged 15-18. For this purpose, percentiles (10th, 25th, 50th, 75th, and 90th) were calculated for each test variable, and performance levels were categorized as “elite,” “excellent,” “good,” “average,” “poor,” and “very poor.” The resulting normative tables were utilized to evaluate and compare the individual performance levels of the youth footballers. In the educational and managerial interpretation proposed in this article, these categories are intended to support formative monitoring and differentiated planning, not to operate as fixed labels for young athletes. In all statistical analyses, the significance level was set at $p < 0.05$.

Beyond the statistical analysis of the data, the implementation of these assessment protocols in youth sports settings should take place in an environment that promotes the psychological safety of young participants. Physical assessments should not be associated with pressure, embarrassment, or competition among students but should instead be viewed as opportunities to monitor individual development.

In this context, teachers and coaches play a fundamental role by using physical assessments as pedagogical tools that encourage self-awareness, a better understanding of individual abilities, and students' active engagement in their own developmental process. Accordingly, physical assessment extends beyond measuring athletic performance and contributes to the promotion of health, autonomy, and the holistic development of young athletes.

RESULTS

The descriptive statistics for the sprint, SLJ, and agility values of the youth football players, categorized by age groups, are presented in Table 1.

Table 1.
Descriptive statistics of sprint, standing long jump (SLJ), and agility values according to the age of youth footballers

Age	Parameter	n	Mean	SD	Minimum	Maximum
15 Years	10 m Sprint (s)	457	1.87	0.19	1.51	2.98
	30 m Sprint (s)		4.71	0.40	3.83	6.00
	SLJ (m)		1.82	2.30	1.21	2.34
	Agility (s)		12.41	1.17	10.39	17.41
16 Years	10 m Sprint (s)	425	1.79	0.11	1.56	2.45
	30 m Sprint (s)		4.51	0.29	4.01	5.50
	SLJ (m)		1.97	2.20	1.38	2.58
	Agility (s)		11.95	1.04	10.01	16.00
17 Years	10 m Sprint (s)	448	1.75	0.09	1.51	2.04

Age	Parameter	n	Mean	SD	Minimum	Maximum
	30 m Sprint (s)		4.41	0.24	3.96	5.20
	SLJ (m)		2.05	2.50	1.29	2.83
	Agility (s)		11.80	0.93	9.79	15.01
18 Years	10 m Sprint (s)	512	1.74	0.11	1.39	2.16
	30 m Sprint (s)		4.34	0.24	3.77	5.43
	SLJ (m)		2.14	2.40	1.27	2.92
	Agility (s)		11.57	0.90	9.23	16.06

Note. The Authors.

The descriptive statistical results for the 10-meter sprint, 30-meter sprint, explosive power, and agility values of the athletes, categorized by age groups, are presented in Table 1. A total of 1,842 athletes, aged 15 to 18 years, participated in the study. For the evaluation, the participants were divided into four age groups: 15 years (n = 457), 16 years (n = 425), 17 years (n = 448), and 18 years (n = 512). For the 15-year-old group, the mean values were 1.87 ± 0.19 s for the 10-meter sprint, 4.71 ± 0.40 s for the 30-meter sprint, 1.82 ± 2.3 m for the SLJ, and 12.41 ± 1.17 s for agility.

In the 16-year-old group, the mean values were recorded as 1.79 ± 0.11 s for the 10-meter sprint, 4.51 ± 0.29 s for the 30-meter sprint, 1.38 ± 2.2 m for the SLJ, and 11.95 ± 1.04 s for agility. Regarding the 17-year-old group, the 10-meter sprint mean was 1.75 ± 0.09 s, the 30-meter sprint mean was 4.41 ± 0.24 s, the explosive power (SLJ) mean was 2.05 ± 2.5 m, and the agility mean was 11.80 ± 0.93 s. Finally, for the 18-year-old group, the mean values were 1.74 ± 0.11 s for the 10-meter sprint, 4.34 ± 0.24 s for the 30-meter sprint, 2.14 ± 2.4 m for the SLJ, and 11.57 ± 0.90 s for agility.

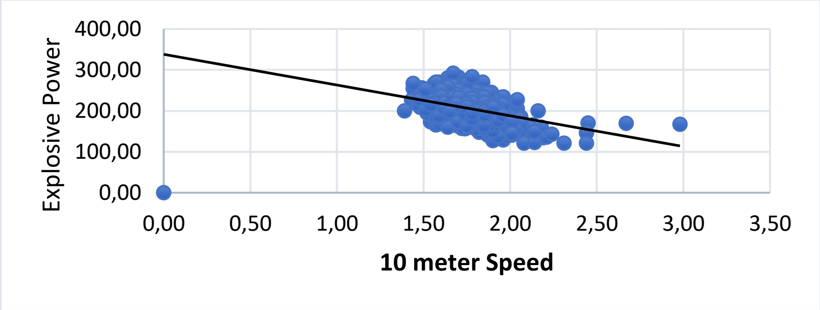
Table 2.
The impact of explosive power levels on sprint and agility performance in the study group

Independent Variable	Dependent Variable	B	Std. Error	β	t	R	R^2	F	p
Explosive Power	10-m Sprint	-0.002	0.000	-0.389	-14.144	0.389	0.151	200.060	<0.001
	30-m Sprint	-0.006	0.000	-0.463	-17.513	0.463	0.214	306.714	<0.001
	Agility (T-test)	-0.016	0.001	-0.398	-14.553	0.398	0.158	211.793	<0.001

Note. The Authors.

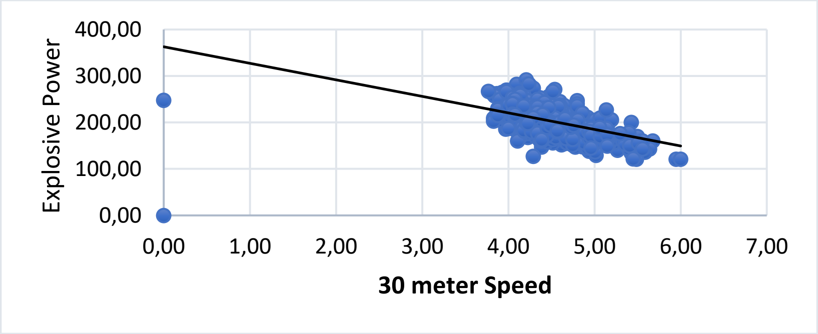
A regression model was established to predict the speed and agility of the participating athletes based on their explosive power (Table 2). According to this model, the regression equations calculated for the relationship between explosive power and 10-meter speed ($p < 0.001$; Figure 2), 30-meter speed ($p < 0.001$; Figure 3), and agility ($p < 0.001$; Figure 4) were found to be statistically significant.

Figure 2.
The impact of explosive power levels on 10-meter sprint performance in the study group



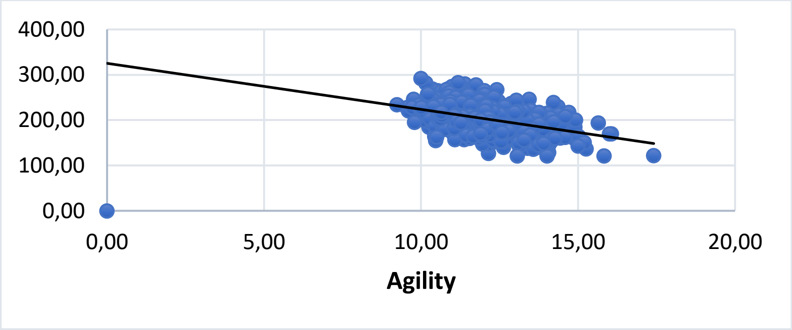
Note. The Authors.

Figure 3.
The impact of explosive power levels on 30-meter sprint performance in the study group



Note. The Authors.

Figure 4.
The impact of explosive power levels on agility performance in the study group



Note. The Authors.

Explosive power explains 15% of the variance in 10-meter sprint performance (R = 0.389; R2 = 0.151), 21% in 30-meter sprint performance (R = 0.463; R2 = 0.214), and 15% in agility performance (R = 0.398; R2 = 0.158). It was determined that a one-unit increase in explosive power results in a -0.389 unit decrease in 10-meter sprint time, a -0.463 unit decrease in 30-meter sprint time, and a -0.398 unit decrease in agility time. It should be noted that a decrease in sprint and agility times indicates an improvement in performance.

Table 3.

Correlation matrix between the performance parameters of the study group

Parameters	Coefficient	10-m Sprint	30-m Sprint	SLJ	Agility
Age	r	-,276**	-,341**	,436**	-,236**
	p	0,000	0,000	0,000	0,000
10-m Sprint	r	1	,742**	-,389**	,557**
	p		0,000	0,000	0,000
30-m Sprint	r		1	-,463**	,610**
	p			0,000	0,000
SLJ	r			1	-,398**
	p				0,000

Note. The Authors.

Pearson correlation analysis was conducted to determine the relationship between age and explosive power, speed, and agility (Table 3). The results indicated a significant negative correlation between age and 10-meter sprint (r=−0.276;p=0.000), 30-meter sprint (r=−0.341;p=0.000), and agility (r=−0.236;p=0.000) scores. Conversely, a significant positive correlation was identified between age and standing long jump performance (r=0.436;p=0.000).

Table 4.

Comparison of performance parameters across age groups in the study group

Parameter	Age Group	N	Mean	SD (Std. Dev.)	df	F	p
10-m Sprint (s)	(a) 15 years	457	1,87	0,19	3 – 1838	59,99	< 0,001*
	(b) 16 years	425	1,79	0,11			
	(c) 17 years	448	1,75	0,09			
	(d) 18 years	512	1,74	0,11			
30-m Sprint (s	(a) 15 years	457	4,71	0,40	3 – 1838	76,58	< 0,001*
	(b) 16 years	425	4,51	0,29			
	(c) 17 years	448	4,41	0,24			
	(d) 18 years	512	4,34	0,24			
SLJ (m)	(a) 15 years	457	1,82	2,30	3 – 1838	116,51	< 0,001*

	(b) 16 years	425	1,97	2,20			
	(c) 17 years	448	2,05	2,50			
	(d) 18 years	512	2,14	2,40			
Agility (s)	(a) 15 years	457	12,41	1,17	3 – 1838	38,25	< 0,001*
	(b) 16 years	425	11,95	1,04			
	(c) 17 years	448	11,8	0,93			
	(d) 18 years	512	11,57	0,90			

Note. The Authors. *There is a statistically significant difference at the p < 0.05 level.

The results of the One-Way Analysis of Variance (ANOVA) conducted to examine the differences in sprint, explosive power, and agility performances among the youth football players according to their age groups are presented in Table 4. According to the analysis, statistically significant differences were identified between the age groups in terms of 10-meter sprint ($F = 59.99$; $p < 0.001$), 30-meter sprint ($F = 76.58$; $p < 0.001$), explosive power ($F = 116.51$; $p < 0.001$), and agility performance ($F = 38.25$; $p < 0.001$).

The findings indicate a distinct increase in explosive power performance with advancing age, alongside a general trend of improvement in sprint and agility times. These results support the impact of biological maturation, muscle strength, and neuromuscular adaptations on performance during the adolescent period.

Table 5.

Performance norms for 10-m sprint, 30-m sprint, SLJ, and T-test in U18 football players

Category	10-m Sprint (s)	30-m Sprint (s)	SLJ Distance (m)	T-Test Time (s)
Elite	< 1.45	< 3.67	> 2.70	< 9.46
Excellent	1.45 – 1.50	3.67 – 3.77	2.53 – 2.70	9.46 – 9.84
Good	1.50 – 1.57	3.77 – 3.89	2.37 – 2.53	9.84 – 10.32
Average	1.57 – 1.64	3.89 – 4.02	2.20 – 2.37	10.32 – 10.88
Poor	1.64 – 1.69	4.02 – 4.17	2.00 – 2.20	10.88 – 11.42
Very Poor	> 1.69	> 4.17	< 2.00	> 11.42

Note. The Authors.

The percentile classification presented in Table 5 provides a normative framework for the 10-meter sprint, 30-meter sprint, standing long jump (SLJ), and T-Test performances of football players in the 18-year-old group. This table is designed to establish six performance levels (Elite, Excellent, Good, Average, Poor, Very Poor) based on specific percentiles (P90, P75, P50, P25, P10), tailored to the physical content and motor components of each test. Since Table 5 expresses not only absolute performance results but also the relative position within the population, it offers a high-resolution scale for evaluating individual differences.

For the 10-Meter Sprint test, the lowest times (e.g., < 1.45 s) fall into the elite category, indicating that these players possess the highest levels of reaction speed and short-distance acceleration capacity. Athletes situated around the P50 mark (approximately 1.74 s) exhibit an average speed profile, while those at P10 and below (> 2.00 s) are identified as having acceleration skills that require further development.

In the 30-Meter Sprint test, athletes categorized as elite are observed to run faster than 3.67 seconds. Performance at this level indicates superior potential in terms of maximal sprint speed and speed endurance (Nowak et al., 2025). While the average class (P50) is at approximately 4.34 seconds, the Very Poor group (> 4.69 s) represents athletes who generally exhibit deficiencies in speed endurance and technical sprinting skills (Nowak et al., 2025).

Regarding SLJ results, the Elite performance level is classified as 2.70 meters and above. This distance reflects high lower-body strength and explosiveness, whereas athletes in the Poor and Very Poor categories (< 2.20 m) should be included in individual development plans, considering potential deficiencies in fundamental strength capacity or technical inadequacies (McAuley et al., 2024).

In the T-Test agility measurement, the Elite level is defined as athletes completing the test in less than 9.46 seconds. These athletes demonstrate superior change-of-direction speed and control (Gonzalo-Skok & Bishop, 2025). While the average group (approximately 11.10 s) possesses fundamental agility characteristics, individuals at P10 and below (> 12.00 s) may harbor deficiencies in change-of-direction skills, balance, or decision-making speed.

Table 6.

Performance norms for 10-m sprint, 30-m sprint, SLJ, and T-test in U17 football players

Category	10-m Sprint (s)	30-m Sprint (s)	SLJ Distance (m)	T-Test Time (s)
Elite	< 1.48	< 3.73	> 2.62	< 9.74
Excellent	1.48 - 1.52	3.73 - 3.82	2.42 - 2.62	9.74 - 10.01
Good	1.52 - 1.57	3.82 - 3.92	2.27 - 2.42	10.01 - 10.51
Average	1.57 - 1.62	3.92 - 4.07	2.06 - 2.27	10.51 - 11.07
Poor	1.62 - 1.69	4.07 - 4.21	1.89 - 2.06	11.07 - 11.63
Very Poor	> 1.69	> 4.21	< 1.89	> 11.63

Note. The Authors.

In this study, 10-meter sprint, 30-meter sprint, standing long jump (SLJ), and T-Test agility data of 17-year-old football players were analyzed. A six-level normative table was established by calculating percentile distributions from the data. The categories are defined as

"Elite," "Excellent," "Good," "Average," "Poor," and "Very Poor." This classification enables an objective evaluation of the motor performance levels of young athletes.

When evaluating sprint performance specifically, the times of athletes in the "Elite" category for the 10-meter sprint test ranged between 1.48–1.52 seconds. These times are highly consistent with the reference ranges specified for elite youth football players in the literature. A similar distribution was observed for the 30-meter sprint, where the times of "Elite" athletes, representing the top 10% percentile, ranged between 3.73–3.82 seconds. These data provide valuable information for assessing short-distance explosive speed in football. In particular, the 30-meter sprint is considered a decisive parameter regarding the development of maximal speed in players (Sonesson et al., 2021).

In the SLJ test, which is a significant indicator of lower-extremity explosive power, the "Elite" category was defined as 2.62 meters and above. This aligns with the average values reported in the literature for elite male youth footballers. Specifically, a jump distance of 2.60 meters and above indicates that lower-extremity power capacity is near the upper levels. This finding is also associated with the advanced development of characteristics such as sprinting and change of direction. Regarding the T-Test agility assessment, the "Elite" performance range was identified as below 9.74 seconds. This value represents a highly competitive level compared to the averages of young athletes with high agility capacity. Since agility in football is defined not only by linear speed but also by a combination of sudden stops, change of direction, and reaction skills, the T-Test serves as a valuable tool for the objective evaluation of this multifaceted ability (Gonzalo-Skok & Bishop, 2025).

Table 7.
Performance norms for 10-m sprint, 30-m sprint, SLJ, and T-test in U16 football players

Category	10-m Sprint (s)	30-m Sprint (s)	SLJ Distance (m)	T-Test Time (s)
Elite	< 1,50	< 3,77	> 2,46	< 9,78
Excellent	1,50 – 1,55	3,77 – 3,90	2,35 – 2,46	9,78 – 10,15
Good	1,55 – 1,58	3,90 – 3,98	2,22 – 2,35	10,15 – 10,42
Average	1,58 – 1,60	3,98 – 4,08	2,09 – 2,22	10,42 – 10,82
Poor	1,60 – 1,67	4,08 – 4,23	1,99 – 2,09	10,82 – 11,18
Very Poor	> 1,67	> 4,23	< 1,99	> 11,18

Note. The Authors.

Table 7 evaluates the speed, strength, and agility components of U16 football players within a holistic normative framework. The 10-m sprint values, representing short-distance sprint performance, provide a critical indicator of players' initial step speed and acceleration capacity. The ≤ 1.50 s threshold identified for the elite level largely aligns with previous studies conducted on elite youth footballers. Similarly, 30-m sprint performance reflects maximal speed and speed maintenance capacity; the < 3.77 s value proposed for the elite level in this study is consistent with the reported performance ranges of U16 footballers at elite academy and national team levels.

In the SLJ test, higher values represent superior performance, facilitating the assessment of lower-extremity explosive power (Nowak et al., 2025). According to Table 7, the threshold of > 2.46 m established for the elite level shows parallelism with the upper performance limits reported in the literature for the U16 age group. Considering the relationship between explosive power and sprint and change-of-direction performance, the position of SLJ within this normative structure serves as a supportive element for speed and agility tests (Sonesson et al., 2021).

T-test results reveal agility performance, reflecting the players' combined abilities of changing direction, braking, and re-acceleration. The time identified as <9.78 s for the elite level is compatible with previously reported agility values for elite youth footballers, suggesting that agility performance depends not only on sprint speed but also on neuromuscular control and eccentric strength capacity. The significant increase in T-test times as one moves toward lower performance categories in Table 7 clearly demonstrates the discriminative role of the agility component in performance differentiation.

Table 8.

Performance norms for 10-m sprint, 30-m sprint, SLJ, and T-test in U15 football players

Category	10-m Sprint (s)	30-m Sprint (s)	SLJ Distance (m)	T-Test Time (s)
Elite	< 1,50	< 3,88	> 2,31	< 9,98
Excellent	1,51 – 1,57	3,89 – 3,97	2,19 – 2,30	9,99 – 10,39
Good	1,58 – 1,65	3,98 – 4,17	2,00 – 2,18	10,40 – 11,00
Average	1,66 – 1,74	4,18 – 4,44	1,83 – 1,99	11,01 – 11,79
Poor	1,75 – 1,87	4,45 – 4,83	1,68 – 1,82	11,80 – 12,59
Very Poor	> 1,88	> 4,84	< 1,67	> 12,60

Note. The Authors.

The normative classification presented in Table 8 represents a percentile-based framework that holistically evaluates 10-m sprint, 30-m sprint, SLJ, and T-test agility performances for U15 male football players. This approach aligns with the concepts of "developmental potential" and "training-attainable performance bands" frequently emphasized in the literature.

Analysis of 10-m sprint values reveals that the elite group is defined as < 1.50 s. This range indicates superior initial step speed and acceleration capacity, largely overlapping with reported values for elite U15–U16 footballers in recent literature (Nowak et al., 2025). The gradual increase in times within the middle and lower groups in Table 8 reflects the heterogeneity of acceleration ability and differences in biological maturation.

In terms of 30-m sprint performance, the elite threshold of < 3.88 s defines a group with high maximal speed capacity. Given that reported 30-m sprint times for U15 footballers generally range between 3.9 and 4.2 s (Nowak et al., 2025; Sellami et al., 2024), the elite and excellent categories in this table correspond to elite academy and national team pools. The performances of athletes in lower percentiles suggest limitations in running mechanics and force production capacity rather than just maximal speed.

Standing long jump values play a central role in the table as an indicator of lower-extremity explosive power. Defining the elite group as > 2.31 m demonstrates high horizontal force production and effective use of the stretch-shortening cycle. Findings by Michailidis (2023) and Hammami et al. (2019) have shown that SLJ performance is moderately to highly correlated with sprint and agility tests. In this context, the systematic decrease in SLJ values from elite to very poor levels points to a physiological basis parallel to the declines in sprint and agility performances.

Regarding T-test agility, the elite threshold of < 9.98 s indicates superior skills in change of direction, braking, and re-acceleration. The literature frequently highlights the T-test as a reliable and discriminative agility measure for youth footballers (Di Mascio et al., 2020; Dugdale et al., 2020). The marked prolongation of times toward the average and poor groups suggests potential deficiencies in eccentric strength, coordination, and neuromuscular control.

Overall, the table demonstrates that speed, strength, and agility components form a complementary performance profile for U15 footballers. The clustering of athletes in elite and excellent categories across all tests supports the concept of "multidimensional physical superiority" (Uz et al., 2024). Thus, Table 8 provides not only a descriptive norm system but also a practical reference framework for talent identification, long-term athlete development, and training programming.

From an educational management perspective, classifications such as "Poor" or "Very Poor" in normative tables should be interpreted with caution, particularly in youth sports settings. A young athlete's placement in the lower percentiles should not be viewed as an indication of inability but rather as a reference point for guiding pedagogical interventions and training planning.

From this perspective, the principles of equity and inclusion suggest that these results should be used to identify specific developmental needs and support individualized monitoring strategies. Accordingly, training management shifts its focus from selecting the most capable athletes to promoting pedagogical practices that respect differences in biological and cognitive development, ensuring that all adolescents have equitable opportunities for learning, improvement, and athletic development.

The findings of this research reveal that lower-extremity explosive power in young male footballers shows strong and significant relationships with sprint and agility performances. Explosive power is a composite of multiple physiological processes, including neural activation, tendon elasticity, and rapid force production ability (Nowak et al., 2025). Consequently, it plays a decisive role in dynamic movements such as sprinting and agility. Furthermore, the age-specific normative tables established based on these findings serve as an essential tool in both training planning and talent selection processes. França et al. (2024) emphasized that normative values provide objective criteria for tracking individual performance development, while Nowak et al. (2025) noted that plyometric training can enhance alignment with these normative references.

DISCUSSION

It is well-established that the capacity to produce high-speed movements significantly impacts football match performance (Falces-Prieto et al., 2022). Research has indicated that both initial acceleration and agility performance serve as potent discriminative factors between elite and regional youth players (Chaouachi et al., 2014; França et al., 2024). Individual differences in motor coordination and other performance tasks emerging during mid-adolescence typically diminish by the age of 18 (Sellami et al., 2024; Laurson et al., 2022; Sal-de-Rellán et al., 2024). Consequently, it is crucial to educate coaches and players regarding the potential for short-term fluctuations in physical performance during mid-adolescent years.

In the present study, the relationships between explosive power levels and speed/agility performances in male youth football players aged 15–18 were examined in detail. Parallel to existing literature, the findings demonstrated that lower-extremity explosive power has a significant predictive effect on both sprint and agility performances. Another major contribution of this study is the establishment of normative values. These normative tables, prepared with age-specific percentiles, enable an objective comparison of athletes' individual performance levels and provide a practical reference framework for coaches and performance analysts.

In the context of educational sports management, the use of these normative tables extends beyond the simple classification of physical performance. They serve as managerial diagnostic tools that support the development of more equitable and inclusive training curricula. For sports academy managers and coordinators of school sports programs, the standardization of these empirical indicators enables more efficient resource allocation and the implementation of institutional policies that prioritize long-term athlete development. As a result, sports administrators are better equipped to reduce institutional pressure for immediate competitive outcomes while aligning sports practice with the principles of holistic education.

From the standpoint of educational policy and management, the results may be read as evidence that systematic assessment can strengthen the organization of youth sport programs. The normative tables created in this study can inform curricular sequencing in sport education, support communication between coaches, families, and athletes, and guide the allocation of training priorities according to age and developmental profile. This educational use requires caution: percentile bands should not be treated as mechanisms of exclusion, but as diagnostic references for individualized support and for the evaluation of program effectiveness.

Another study concerning team sports revealed that strength training implemented during the pre-season is particularly effective for developing speed and aerobic performance. Accordingly, it is recommended to incorporate strength-based programs at the start of the season and utilize longer-term or sport-specific training content to enhance agility and vertical jump performance (Tok et al., 2025).

Firstly, explosive power—measured via the standing long jump (SLJ) test—was found to be a primary determinant of sprint performance. Regression analyses indicated that explosive power explained 15% of the variance in 10-meter sprint times and 21% in 30-meter sprint times. These findings align with the study by Castro-Infantes et al. (2025), which reported that the impact of explosive power on sprint performance ranged between 44% and 47%, emphasizing the critical role of lower-body strength in sprint development. This suggests that sprinting is not merely a mechanical movement but a result of complex physical attributes such as muscle strength, elastic energy utilization, and neuromuscular coordination. The correlation observed between SLJ values and agility tests further underscores the importance of explosive power, particularly in sports requiring high change-of-direction (COD) ability (Gisladottir et al., 2024). Gonzalo-Skok & Bishop (2025) noted that producing sufficient explosive force is a prerequisite for success in agility tests.

The study data also revealed a significant relationship between agility performance and explosive power. Specifically, 15% of the T-test duration was explained by explosive power. Baze et al. (2025) similarly reported moderate-to-high correlations between lower-extremity explosive strength and agility/COD performances in youth footballers. Various training methods have been highlighted as effective for agility development. Notably, plyometric and contrast strength training concurrently enhance both agility and sprint performance (Kobal et al., 2017; Hammami et al., 2017). This indicates that agility encompasses complex biomechanical and neuromuscular processes, including sudden braking, eccentric force production, and re-acceleration, rather than just the capacity to change direction. Furthermore, combined strength and speed training twice a week has been shown to improve sprint times in youth footballers by up to 7% (Sariati et al., 2021).

The strong correlation between sprint performance and agility is also noteworthy. The correlation coefficient between 30-meter sprint time and T-test agility time ($r = 0.610$) suggests that these two performance components share common physiological foundations. This relationship has been similarly reported by Sal-de-Rellán et al. (2024) and Hammami et al. (2017), pointing to the importance of developing these parameters simultaneously in training planning. Agility is a multidimensional capacity, involving eccentric force production, balance, reactivity, and decision-making processes alongside COD capacity (Taylor et al., 2019). This finding implies that sprint-based training can play an active role in improving the COD speed of young footballers. Michailidis et al. (2020) stated that explosive sprint training can produce a cross-development effect on agility.

Regarding the age variable, it was found that explosive power increases with age, leading to a parallel improvement in sprint and agility performances. This indicates that biological maturation—specifically increased muscle mass and motor skill development—directly contributes to performance. Sellami et al. (2024) reported significant reductions in sprint and agility times (performance improvement) and increases in SLJ distances among footballers aged 15–18. Similarly, age-specific normative data for sprint, agility, and power are considered critical for training planning and talent identification (Nowak et al., 2025; Laurson et al., 2022).

Further research is needed to identify the underlying physiological and musculoskeletal changes explaining the variable relationships between aerobic metabolism, explosive power, and repeated sprint ability throughout the peak height velocity period in developing team sport athletes. This information will assist coaches and strength and conditioning specialists in providing specific recommendations, as applying the same exercise or training volume may lead to poor training effects or injuries in maturing youth players. While physical performance generally increases with age in youth football, some studies report a plateau starting from age 15 (Oliver et al., 2024; Sellami et al., 2024).

FINAL CONSIDERATIONS

This study demonstrated that lower-extremity explosive power is significantly associated with speed and agility performance among male football players aged 15–18. The results showed progressive improvement across age groups, especially in standing long jump, 10-meter and 30-meter sprint, and T-test agility performance. These findings confirm that physical development in youth football is multidimensional and that sprinting, change of direction, and explosive power should be interpreted together rather than as isolated indicators.

The main contribution of the article is the development of age-specific normative tables based on a large sample of young football players in Turkey. These tables may support coaches, physical education professionals, and sport program managers in planning training contents, monitoring individual progress, and identifying developmental needs. In this sense, the study is not restricted to the measurement of athletic performance; it also offers an evidence-based instrument for the pedagogical organization and management of youth sport education.

The findings should nevertheless be interpreted with attention to their limits. The sample included only male football players from Turkish clubs, and the analyses did not incorporate biological maturation indicators, training history, socioeconomic context, injury history, or qualitative information about training environments. Therefore, the normative tables should not be generalized to all youth athletes or used as definitive selection criteria. Their most appropriate use is formative: they can indicate tendencies, guide individualized interventions, and help evaluate whether training programs are responding to the needs of different age groups.

Future studies should include female athletes, different regions and competitive levels, longitudinal designs, and variables related to maturation, school sport organization, coaching pedagogy, and institutional management. Such expansions would allow a more comprehensive understanding of how physical performance assessment can contribute not only to talent development, but also to educationally responsible and developmentally appropriate sport programs.

In conclusion, incorporating these normative tables into the routine of sports institutions represents an advance that extends beyond technical assessment to encompass pedagogical and managerial dimensions. By replacing an exclusionary selection approach with one focused on continuous monitoring and the long-term development of young athletes, this study provides an evidence-based framework to guide school sports policies and the practices of youth sports clubs in an ethical, responsible, and inclusive manner. In this context, the appropriate use of these indicators strengthens the contribution of sport science to educational management by supporting more informed and equitable decision-making while ensuring that the holistic development and well-being of young athletes remain the primary focus.

REFERENCES

Baze, A., Delia, B., Muca, G., & Derhemi, L. (2025). Relationship between agility and speed with explosive power of lower limbs in youth football players: Field- and laboratory-based assessment. *Innovative Technologies in Sport and Physical Activity, 4*(3), 3–8. https://doi.org/10.56886/itspa.250601

Castro-Infantes, S., Silva, A. F., Hermoso, V. M. S., Jabalera, J. O., Clemente, F. M., & Fernández, F. T. G. (2025). Assessing the impact of body composition and physical fitness parameters on performance prediction in youth soccer players. *Retos, 73*, 300–313. https://doi.org/10.47197/retos.v73.117113

Chaouachi, A., Chtara, M., Hammami, R., Chtara, H., Turki, O., & Castagna, C. (2014). Multidirectional sprints and small-sided games training effect on agility and change of direction abilities in youth soccer. *The Journal of Strength & Conditioning Research, 28*(11), 3121–3127.

Di Mascio, M., Ade, J., Musham, C., Girard, O., & Bradley, P. S. (2020). Soccer-specific reactive repeated-sprint ability in elite youth soccer players: Maturation trends and association with various physical performance tests. *The Journal of Strength & Conditioning Research, 34*(12), 3538–3545.

Dugdale, J. H., Sanders, D., & Hunter, A. M. (2020). Reliability of change of direction and agility assessments in youth soccer players. *Sports, 8*(4), Article 51. https://doi.org/10.3390/sports8040051

Falces-Prieto, M., González-Fernández, F. T., García-Delgado, G., Silva, R., Nobari, H., & Clemente, F. M. (2022). Relationship between sprint, jump, dynamic balance, and change of direction on young soccer players' performance. *Scientific Reports, 12*(1), Article 12272. https://doi.org/10.1038/s41598-022-16558-9

França, C., Gouveia, É. R., Martins, F., Ihle, A., Henriques, R., Marques, A., Sarmento, H., Przednowek, K., & Lopes, F. (2024). Lower-body power, body composition, speed, and agility performance among youth soccer players. *Sports, 12*(5), Article 135. https://doi.org/10.3390/sports12050135

Gisladottir, T., Petrović, M., Sinković, F., & Novak, D. (2024). The relationship between agility, linear sprinting, and vertical jumping performance in U-14 and professional senior team sports players. *Frontiers in Sports and Active Living, 6*, Article 1385721. https://doi.org/10.3389/fspor.2024.1385721

Gonzalo-Skok, O., & Bishop, C. (2025). Effects of maturation on the magnitude and direction of asymmetry in jumping and change of direction speed in young elite football players. *The Journal of Strength & Conditioning Research, 39*(1), 70–78.

Hammami, M., Gaamouri, N., Shephard, R. J., & Chelly, M. S. (2019). Effects of contrast strength vs. plyometric training on lower-limb explosive performance, ability to change direction, and neuromuscular adaptation in soccer players. *The Journal of Strength & Conditioning Research, 33*(8), 2094–2103.

Hammami, M., Negra, Y., Shephard, R. J., & Chelly, M. S. (2017). The effect of standard strength vs. contrast strength training on the development of sprint, agility, repeated change of direction, and jump in junior male soccer players. *The Journal of Strength & Conditioning Research, 31*(4), 901–912. https://doi.org/10.1519/JSC.0000000000001815

Karaca, Y., & Ilkım, M. (2021). Investigation of the attitudes toward distance education of the faculty of sport science students during the COVID-19 period. *Turkish Online Journal of Distance Education, 22*(4), 114–129.

Kobal, R., Loturco, I., Barroso, R., Gil, S., Cuniyochi, R., Ugrinowitsch, C., Roschel, H., & Tricoli, V. (2017). Effects of different combinations of strength, power, and plyometric training on the physical performance of elite young soccer players. *The Journal of Strength & Conditioning Research, 31*(6), 1468–1476. https://doi.org/10.1519/JSC.0000000000001609

Laurson, K. R., Baptista, F., Mahar, M. T., Welk, G. J., & Janz, K. F. (2022). Long jump, vertical jump, and vertical jump power reference curves for 10–18-year-olds. *Measurement in Physical Education and Exercise Science, 26*(4), 306–314. https://doi.org/10.1080/1091367X.2021.2017291

McAuley, A. B., Hughes, D. C., Tsaprouni, L. G., Varley, I., Suraci, B., Bradley, B., Baker, J., Herbert, A. J., & Kelly, A. L. (2024). Genetic associations with acceleration, change of direction, jump height, and speed in English academy football players. *The Journal of Strength & Conditioning Research, 38*(2), 350–359. https://doi.org/10.1519/JSC.0000000000004634

Michailidis, Y. (2023). Relation of jump and change of direction inter-limb asymmetries with fitness in youth male soccer players. *Medicina, 59*(10), Article 1749. https://doi.org/10.3390/medicina59101749

Michailidis, Y., Savvakis, C., Pirounakis, V., Mikikis, D., Margonis, K., & Metaxas, T. (2020). Association between jump asymmetry and reduced performance in the change of direction tests of youth soccer players. *Journal of Physical Education and Sport, 20*(3), 1360–1368. https://doi.org/10.7752/jpes.2020.03188

Nowak, M., Szymanek-Pilarczyk, M., Stolarczyk, A., Oleksy, Ł., Muracki, J., & Wąsik, J. (2025). Normative and limit values of speed, endurance, and power test results of young football players. *Frontiers in Physiology, 15*, Article 1502694. https://doi.org/10.3389/fphys.2024.1502694

Oliver, J. L., Ramachandran, A. K., Singh, U., Ramirez-Campillo, R., & Lloyd, R. S. (2024). The effects of strength, plyometric, and combined training on strength, power, and speed characteristics in high-level, highly trained male youth soccer players: A systematic review and meta-analysis. *Sports Medicine, 54*(3), 623–643. https://doi.org/10.1007/s40279-023-01944-8

Sal-de-Rellán, A., Ben Brahim, M., Hernaiz-Sánchez, A., Tarwneh, R., & Martín, V. (2024). Effects of resisted sprint training with ball on speed and agility performance in U-19 elite soccer players. *PLOS ONE, 19*(10), e0311002. https://doi.org/10.1371/journal.pone.0311002

Sariati, D., Hammami, R., Zouhal, H., Clark, C. C., Nebigh, A., Chtara, M., Chortane, S. G., Hackney, A. C., Souissi, N., Granacher, U., & Ounis, O. B. (2021). Improvement of physical performance following a 6-week change-of-direction training program in elite youth soccer players of different maturity levels. *Frontiers in Physiology, 12*, Article 668437. https://doi.org/10.3389/fphys.2021.668437

Sellami, M., Makni, E., Moalla, W., Tarwneh, R., & Elloumi, M. (2024). Effect of maturation level on normative specific-agility performance metrics and their fitness predictors in soccer players aged 11–18 years. *BMC Sports Science, Medicine and Rehabilitation, 16*(1), Article 61. https://doi.org/10.1186/s13102-024-00855-z

Sonesson, S., Lindblom, H., & Hägglund, M. (2021). Performance on sprint, agility, and jump tests have moderate to strong correlations in youth football players, but performance tests are weakly correlated to neuromuscular control tests. *Knee Surgery, Sports Traumatology, Arthroscopy, 29*(5), 1659–1669. https://doi.org/10.1007/s00167-020-06302-z

Şahin, M., Ayhanci, N. N., Erdem, M., Apak, H., Parlak Özer, Z., & Ilkim, M. (2025). The roles of body image, drive for muscularity, and spiritual well-being in the relationship between disordered eating and exercise addiction among sports science students: A moderated model. *Journal of Eating Disorders, 13*, Article 243. https://doi.org/10.1186/s40337-025-01437-1

Taylor, J. M., Cunningham, L., Hood, P., Thorne, B., Irvin, G., & Weston, M. (2019). The reliability of a modified 505 test and change-of-direction deficit time in elite youth football players. *Science and Medicine in Football, 3*(2), 157–162. https://doi.org/10.1080/24733938.2018.1526402

Tok, Ş., Kirişci, İ., & Bayrakdar, A. (2025). Investigation of the effect of strength training on biomotor characteristics of young volleyball players at the beginning of the season. *Kilis 7 Aralık Üniversitesi Beden Eğitimi ve Spor Bilimleri Dergisi, 9*(2), 139–152.

Uz, S., Zeyrek, Ş., & Altuntaş, Y. T. (2024). Özel yetenekli öğrencilerde fiziksel aktivitenin çok yönlü boyutlarının incelenmesi. *IJSS, 8*(35), 647–658. https://doi.org/10.52096/usbd.8.35.31

CRediT Author Statement

- **Acknowledgments**: The authors are grateful to the respondents who willingly took part in the study.
- **Funding**: No funding was involved; the authors were self-funded.
- **Conflicts of interest**: Authors declare that they have no conflicts of interest.
- **Ethical approval**: Ethical approval for the study was obtained from the Istanbul Rumeli University Ethics Committee (Document No: E-53938333-050-31677). Informed consent and parental consent were obtained before participation.
- **Data and materials availability**: The data supporting the findings of this study are available from the authors upon request.
- **Author contributions**: All authors participated equally in the entire process of writing the article.

Processing and editing: Editora Ibero-Americana de Educação
Proofreading, formatting, normalization and translation