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Differences in chosen physiological profile characteristics between U16 men basketball players

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ABSTRACT

The purpose of this study was to evaluate the physiological profiles of young male basketball players of the preliminary U16 National Team of the Hellenic Basketball Federation. A total of 52 participants, aged 15.4 years on average, underwent a series of physiological tests including Counter-movement Jump (CMJ), Squat Jump (SJ), Drop Jump (DJ), 0-10m Sprint, and 5-10-5 Agility Test. Players were classified by age group, selected/non selected and playing position, with significant performance differences noted between the 2007 and 2008 birth cohorts. Results indicated that older athletes exhibited superior performance in CMJ, 5-10-5, and 0-10m Sprint tests. When comparing by position, Forwards outperformed Guards in both SJ and DJ tests. When comparing performance by playing position, Forwards consistently outperformed Guards in both the Squat Jump and Drop Jump tests, indicating that position-specific training may enhance certain physical attributes. Furthermore, selected players from the 2007 class achieved significantly higher scores in CMJ, SJ, and better times in the 5-10-5 test compared to their non-selected counterparts. Similar trends were observed in the 2008 class, where selected players also demonstrated superior performance in CMJ, SJ, and 5-10-5 tests. Across the overall sample, selected athletes consistently performed better in all tests, achieving significant differences in CMJ, SJ, DJ, 5-10-5, and 0-10m Sprint results. These findings suggest that physiological attributes, particularly jumping ability and agility, are critical factors for selection in youth basketball. The results highlight the importance of age and position in assessing athletic performance among young basketball players. Overall, the study emphasizes the need for tailored training programs to enhance these key physiological characteristics in aspiring athletes.

Keywords: Health, U16 basketball players, Physiological profile, Speed, Agility, Jumping ability.

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INTRODUCTION

Basketball is a high-intensity sport that imposes significant physiological demands on players, particularly among the U16-U18 age group. Young basketball players must possess a combination of aerobic and anaerobic fitness, agility, speed, and explosive power to compete effectively (Boone & Bourgois, 2013; Kostopoulos, 2015). The nature of the game requires frequent changes in direction, sprinting, and jumping, leading to elevated heart rates and energy expenditure during matches (Vukasevic et al., 2021; Ferioli et al., 2020). Additionally, these demands are exacerbated by the competitive environment, necessitating that athletes develop not only physical skills but also tactical and cognitive abilities to enhance their performance on the court (Borovi & Garafoli, 2016; Hůlka et al., 2013). Research highlights the critical role of speed, agility, and power as fundamental physical attributes in this demographic (Čaušević et al., 2022).

The physiological profiles of U16-U18 basketball players are influenced by maturation timing, which can significantly affect performance and selection for elite teams. Early maturation can confer advantages in physical attributes such as strength, height, and muscle mass, which are critical for success in basketball (Arede et al., 2019; Jiménez-Daza et al., 2023). Studies indicate that players who mature earlier are often favoured in talent identification and selection processes, highlighting the importance of understanding individual maturation trajectories in young athletes (Kalén et al., 2021; Ramos et al., 2019).Additionally, the association of physical abilities and physiological characteristics with competitive efficacy has been observed, emphasizing the role of these factors in player selection (Zaric., 2021). Furthermore, differences in anthropometric characteristics between players selected for primary versus secondary teams further underscore the impact of maturation on competitive efficacy (İMer & Yapici, 2018; Šimunović et al., 2017). The influence of training load and maturity timing on future national team selection has also been noted, emphasizing the importance of these factors in the developmental pathway of young athletes (Arede et al., 2022).

Fitness testing plays a crucial role in assessing the physiological abilities of U16-U18 basketball players, providing valuable insights into their performance capabilities and guiding training interventions. Common tests focus on key physical attributes, including speed, agility, and vertical jump performance, which are essential for effective play(Morrison et al., 2022; Zaric., 2021). The implementation of specific tests tailored to basketball, such as the unique jumping tests for measuring explosive power, is critical for developing targeted training strategies (Čaušević et al., 2023; Shalom et al., 2024). Furthermore, the relationship between jump performance and sport age has been documented, indicating that fitness testing can inform coaches about an athlete's readiness for competition(Cabarkapa et al., 2024; Mancha-Triguero et al., 2021; Orhan et al., 2019). Moreover, performance differences based on selection status and playing position highlight the importance of tailored fitness assessments in maximizing player potential (Rösch et al., 2022).

The development of U16-U18 basketball players necessitates a multifaceted approach that considers the interplay of physiological demands, maturation timing, and fitness testing. As the sport continues to evolve, integrating emerging research on training methodologies and performance metrics is essential for optimizing athlete development (Ferioli et al., 2018; Vázquez-Guerrero et al., 2019). Continued exploration of factors influencing performance in young basketball players, such as psychological readiness and recovery strategies, will further enhance our understanding of talent development in this competitive environment (Bezmylov et al., 2024; Pernigoni et al., 2024)**.**By prioritizing all these aspects, coaches and sports scientists can better support young athletes on their journey toward elite performance. Therefore, the purpose of the study was to a) record the physiological profile characteristics of certain abilities of U16 basketball Players and b) to compare the findings between two different age groups of the U16 category as well as between the

different playing positions of basketball and whether the players were eventually selected or not for the participation in the U16 National Team.

MATERIALS AND METHODS

Participants

The sample size consisted of 52 young male basketball players that were part of the preliminary U16 National Team Groups of the Hellenic Basketball Federation, with all of them being potential candidates for selection by the U16 Team that would later in the summer, compete in the U16 European Men Championship (mean weight 77.7 ± 12.7 kg, mean height 191 ± 9.2 cm, mean age 15.4 ± 0.8 years). The players were then further classified firstly based on their age group (year of birth), with 30 players born in 2007 (52,2% of the sample size) and 22 born in 2008 (42,2% of the sample size) and secondly based on the position they covered mostly on court, 20 Guards ,17 Forwards and 15 Centers. The classification to the players playing positions was made and approved by 2 separate FIBA certified coaches that were part of the coaching stuff of the U16 National Team. Upon their arrival at the training facilities, the players and their parents were thoroughly informed about the research procedures and content, as well as the risks and benefits that the players would gain from the obtained results. Subsequently, written consent was obtained from the parents or legal guardians for their children's participation in the study procedures. The research was reviewed and approved by the ethics committee of the University of Peloponnese, School of Human Movement and Quality of Life, Department of Sports Organization and Management, University of Peloponnese, Sparta, Laconia, and was in accordance with the principles of the Declaration of Helsinki (2008).

Procedures

All physiological profile measurements were made on the first two days of the players' presence at the U16 National Team Training Camp, three weeks prior of the U16 European Men Championship. Before the measurements were conducted, all participants completed a questionnaire regarding their health status, were checked for lower extremity injuries by a certified physician and then signed a consent form allowing the tests to be performed. In order to minimize omissions as much as possible and to ensure optimal conditions for measuring the characteristics required, all assessments were carried out at the same time after the players' breakfast (09:30-10:30 a.m.), with the evaluation of the physiological characteristics taking place in a basketball gym with wooden floor and indoor temperature controlled (25°C-27°C). Players were divided into groups based on their playing positions (Guards, Forwards, Centers) with each group being examined separately. On the first day of the Training camp the players that were born in the year 2007 were measured and then the next day the remaining players that were born in the year 2008 also went through the same procedures.

To determine and compare the physiological profile differences between the selected/non selected players as well as between the different playing positions and the year of birth the following physiological tests were measured for each participant: CMJ, DJ, SJ, 5-10-5 Agility Test and 0-10m. Sprint. Overall, the parameters measured to define and identify the differences of the physiological profile were divided into 3 characteristics: speed (0-10m Sprint), Agility (5-10-5 Test) and jumping ability / anaerobic power (CMJ, SJ, DJ).

Each athlete was examined on 2 separate occasions and performed a total of 5 physiological tests. The day before the tests were to take place, participants were asked to refrain from any strenuous activities and consume only their dietary programs given out by the stuff members. Sessions were completed within an hour after the players first try. After a thorough explanation of the experimental procedures, the players completed a standardized warm-up consisting of 5 minutes of jogging, 5 minutes of dynamic stretching, and

5 minutes of short acceleration-decelerations with gradual build-up of running speed, submaximal jumping, and agility drills. For the final five minutes of the warm-up, the players performed tests at submaximal intensity to enhance the warm-up of specific muscles and joints and were familiarized with the procedures and technique of each test. The 2 sessions were presented in random order as described below. Session 1 took place on the basketball court used for basketball practice. It consisted of 3 field tests presented in this series: Counter-movement Jump (CMJ), Squat Jump (SJ) and Drop Jump (DJ).

Counter-movement Jump (CMJ) Test
Players started by standing with their hands on their hips (i.e., without swinging their arms). They were then instructed to bend their knees (approximately 90°) as fast as possible and then jump as high as possible in the next concentric phase. The test was held on the wooden floor of the basketball court and each athlete was given a 90-second break between jumping repetitions, while allowing 5 minutes of rest until the next jump test. The players made 3 jumps and the best result was recorded.

Squat Jump (SJ) Test
Players started from the upright position with their hands on their hips and then were instructed to bend their knees and hold a predetermined knee position (approximately 90°) and the examiner then measured for 3 seconds. In measurement 3, the athlete was instructed to jump as high as he could without performing any reverse movement before performing the jump. The test was held on the wooden floor of the basketball court and each athlete was given a 90-second break between jumping repetitions, while allowing 5 minutes of rest until the next jump test. The players made 3 jumps and the best result was recorded.

Drop Jum (DJ)Test
The athlete stands on top of a box (40cm) in a parallel position with their hands on their hips. The movement was initiated by ‘’stepping’’ out of the box with a single leg by player when they were ready. Then the players started to descend down from the box to the floor with limbs and trunk stiffened. On ground contact the feet were shoulder width apart and then immediately players performed a jump upwards again with and hip, knee and ankle fully extended (Pedley et al., 2017).If a players ankle touched the ground before the jump, test was not recorded and another attempt was made. The test was held on the wooden floor of the basketball court and each athlete was given a 90-second break between jumping repetitions. The players made 3 jumps and the best result was recorded.

The Optojump system (Optojump Next®, Italy) measured the flight time of the jumps with an accuracy of 1/1000 seconds (1 kHz) for the 3 jump tests through the height of the jumps (in cm).

Session 2 took place on the basketball court used for training 15 minutes after the end of Session 1. It consisted of 2 field trials presented in this order: 0-10m. Sprint Test and 5-10-5m. Agility Test.

0-10m. Sprint Tests
Players started from an upright position behind the starting line when they were ready. The sprint time was recorded by photocells (Wireless speedtrap2; Brower Timing Systems, Draper, UT), as they passed through the 3 gates (0-5-10m.) With the command "*Let's go*", the players ran 10 meters as fast as possible. When they crossed the finish line, the time of 0m. and 10m. were recorded. 3 attempts were made with the best one per distance being recorded. Distances up to 10m. were chosen as it appeared at developmental ages the majority of basketball sprints lasted up to 2 sec (Lehnert et al., 2013). The test was held on the wooden floor of the basketball court and each athlete was given a 90-second break between repetitions, while allowing 5 minutes of rest until the next jump test. The players made 2 attempts and the best result was recorded.

5-10-5 Agility Test

Athletes start in the middle of the route in an upright position. When they were ready, they sprinted 5 meters to one side (which one they preferred the most), then 10 meters to the opposite side passing the centre line of the court and finally finished by sprinting 5 meters to the starting point. Timing was recorded by photocells (Wireless speedtrap2; Brower Timing Systems, Draper, UT) and began when the athlete first moved and ended when they crossed the finish line. The test was held on the wooden floor of the basketball court and each athlete was given a 90-second break between repetitions. The players made 2 attempts and the best result was recorded.

Statistical analysis

Initial data collection was performed and categorized using the Microsoft Excel program. All data were then transferred and after processing, all statistical analyses were performed using the Social Science Statistical Package (SPSS version 24.0, IBMSPSS, Chicago, IL). Descriptive data analysis was performed using mean values and standard deviations (M ± SD) for the quantitative variables related to the athletes' measurements. In the inductive analysis, potential differences in measurements among different age groups (year of birth), different playing positions, and athlete selections or not for the participation in national teams were examined using T-tests and one-way ANOVA. Additionally, a Post Hoc test was conducted using the Bonferroni criterion for significant results where comparisons between more than two groups were necessary. The significance level for the research was set at α = .05 (5%).

RESULTS

Comparisons by age

The means and standard deviations of the athletes' performances between the two age groups are presented below (Table 1). For each difference, a t-test for equal means was conducted to identify statistical results. There appears to be a trend in the results, with older athletes (Class of 2007) recording better performances on average. A total of four significant results were found, which are analysed below.

Table 1. Comparison of measurements by age of athletes.

Measurements	Mean ± Standard Deviation	
	Class of 2007	Class of 2008
CMJ	45.5 ± 4.077	43.01 ± 3.507
Squat jump	28.56 ± 4.553	27.99 ± 4.775
Drop jump	41.54 ± 6.021	39.41 ± 4.053
5-10-5	5.23 ± 0.265	5.43 ± 0.401
0-10	1.91 ± 0.071	1.99 ± 0.166

Among the two classes, a significant difference was found in the performance of the CMJ test ($t(50) = 2.302$, $p = .026$). Athletes born in 2007 recorded higher jumps (M = 45.5) compared to those born in 2008 (M = 43.01). Additionally, a significant difference was identified in the performance of the 5-10-5 test by age ($t(34) = -2.074$, $p = .046$). The Class of 2008 had slower times (M = 5.43) compared to the Class of 2007 (M = 5.23). Finally, a significant difference was also found in the 0-10 test ($t(26) = -2.249$, $p = .033$). Those born in 2008 took longer to complete the test (M = 1.99) compared to those born in 2007 (M = 1.91).

Comparisons by position

The means and standard deviations of the measurements by positions are presented below (Table 2). Additionally, ANOVA tests indicated that there are two statistically significant differences in the measurements by position.

Table 2. Comparison of descriptive characteristics among groups.

Measurements	Mean ± Standard Deviation		
	Guard	Forward	Centers
CMJ	44.04 ± 4.412	44.37 ± 4.028	45.06 ± 3.622
Squat jump	26.12 ± 5.077	29.75 ± 4.374	29.37 ± 3.27
Drop jump	38.85 ± 5.678	41.3 ± 6.172	42.11 ± 2.99
5-10-5	5.4 ± 0.338	5.32 ± 0.4	5.21 ± 0.299
0-10	1.93 ± 0.099	1.93 ± 0.12	1.96 ± 0.167

Significant differences were found by position only in the Squat Jump test ($F(2,49) = 3.792$, $p = .029$). The highest jumps were made by Forward players (M = 29.75), followed by Centers (M = 29.37) and Guards (M = 26.12). The Post Hoc analysis using the Bonferroni criterion indicates that significant differences exist between Guards and Forwards, as well as between Guards and Centers.

Selection of players from the 2007 class

Table 3 presents the means and standard deviations of the performances of the athletes from the 2007 class in the tests. The results indicated that there are several differences between the two groups, with those selected achieving better performances in all tests. From the T-test analyses, three statistically significant results were found.

Table 3. Comparison of measurements based on final selection of athletes (2007).

Measurements	Mean ± Standard Deviation	
	Selected	Not Selected
CMJ	47.4 ± 3.338	44.23 ± 4.111
Squat jump	30.74 ± 3.256	27.1 ± 4.785
Drop jump	43.2 ± 4.731	40.44 ± 6.643
5-10-5	5.00 ± 0.161	5.49 ± 0.276
0-10	1.89 ± 0.069	1.92 ± 0.071

In the sample of athletes born in 2007, a significant difference was found in the performance of the CMJ test between those selected for the national teams and the others ($t(28) = -2.221$, $p = .035$). The athletes who were selected achieved better jumps on average (M = 47.4) compared to those who were not selected (M = 44.23). Additionally, significant differences were found in the performance of the Squat Jump test between the two groups ($t(28) = -2.299$, $p = .029$). Those selected recorded better jumps (M = 30.74) compared to those not selected (M = 27.1). Another significant result pertains to the 5-10-5 (R) test based on whether the athlete was selected ($t(28) = 5.586$, $p < .001$). The athletes who were ultimately selected took less time (M = 5.0) to complete the test compared to those who were not selected (M = 5.49).

Selection of players from the 2008 class

Similar results were found in the sample of athletes born in 2008 (Table 4). As seen below, several differences are identified between the two groups, with the selected athletes recording the best performances. Among the observed differences, three were statistically significant.

In the sample of athletes born in 2008, a significant difference was found in the performance of the CMJ jump based on whether the athlete were selected or not ($t(8) = -2.315$, $p = .048$). The athletes who were selected achieved higher jumps (M = 45.46) compared to those who were not selected (M = 41.61). Significant differences were also found in the performance of the Squat Jump test ($t(20) = -2.684$, $p = .014$). Those selected achieved better jumps on average (M = 31.16) compared to the others (M = 26.17). Finally,

significant differences were found in the 5-10-5 test based on selection (t(20) = 2.401, *p* = .026). The athletes who were selected had better times in the test (M = 5.19) compared to the others (M = 5.57).

Table 4. Comparison of measurements based on final selection of athletes (2008).

Measurements	**Mean ± Standard Deviation**	***p*-value (t-test)**
	Selected	Not Selected
CMJ	45.46 ± 4.507	41.61 ± 1.77
Squat jump	31.16 ± 4.691	26.17 ± 3.902
Drop jump	41.05 ± 1.529	38.47 ± 4.762
5-10-5	5.19 ± 0.449	5.57 ± 0.306
0-10	1.91 ± 0.091	2.04 ± 0.183

Selection of players from the two years of birth combined

The above analyses were also conducted for the overall sample of athletes (Table 5). The results show many differences between those selected and the others in all tests, with six of the results being statistically significant.

Table 5. Comparison of measurements based on final selection of athletes (overall).

Measurements	**Mean ± Standard Deviation**	
	Selected	Not Selected
CMJ	46.62 ± 3.858	43.09 ± 3.51
Squat jump	30.91 ± 3.78	26.69 ± 4.377
Drop jump	42.34 ± 3.871	39.58 ± 5.89
5-10-5	5.08 ± 0.285	5.47 ± 0.307
0-10	1.89 ± 0.077	1.97 ± 0.143

In the overall sample, a significant difference was found in the performance of the CMJ tests between those selected and the others (t(50) = -3.404, *p* = .001). The athletes who were selected achieved higher jumps on average (M = 46.62) compared to those who were not selected (M = 43.09). Additionally, significant differences were found in the Squat Jump test (t(50) = -3.555, *p* = .001). Selected athletes performed better jumps (M = 30.91) compared to the others (M = 26.69).

Moreover, significant results were found in the 5-10-5 test based on selection (t(50) = 4.565, *p* < .001). The athletes who were selected had better times (M = 5.08) compared to those who were not selected (M = 5.47). Finally, significant differences were also noted in the 0-10 test (t(50) = 2.168, *p* = .035), with those selected having better times on average (M = 1.89) compared to those not selected (M = 1.97).

DISCUSSION

The analysis of the results of the present study revealed notable trends in athletic capabilities that can be crucial for coaching and training practices. The first purpose of the study was to record certain abilities (speed, agility, jumping ability/anaerobic power) of U16 Men Basketball Players. The findings showed that the athletes of the present study showcased almost identical jumping results on the CMJ test with same age group U16 elite athletes that were part of the U16 Croatian National Team ((Borovi & Garafoli, 2016; Šimunović et al., 2017). In particular the athletes of the study recorded around 44 ± 1.5 cm in the CMJ performance test but had significantly worst performances in the SJ compared to their Croatian peers. CMJ is a test that is widely used by Practitioners in the sport to identify and record power outputs. It is also interesting to mention that the players of the present study exhibited slightly higher results in the CMJ test than elite Men professional

basketball players of Turkey and Belgium but worst results in the SJ Test than Italian Men professional basketball players, showing that at the U16 level players have started to mature physically and are susceptive to training adaptions in jumping ability/anaerobic power (Altavilla et al., 2018; Boone & Bourgois, 2013; Köklü et al., 2011).In general the performance results exhibited by the players in the current study on SJ Test (28 ± 1 cm) was worse compared to Men professional basketball Players but were similar with results obtained from U15 Basketball players of Portugal (Arede et al., 2019).Previous research on sprint speed of young basketball players has showed that U16 players typically complete the 10m sprint in 1.9 ± 0.5s (Aksović et al., 2020; Androutsopoulos et al., 2022; Čaušević et al., 2022).The findings of the study did not showed anything different with results ranging from 1.82s to 2.00s.The above results were slightly worse than the ones recorded on adult men semi-professional basketball players, that completed the 10m sprint roughly -0.2s faster (Scanlan et al., 2014). Seems that speed is a physical ability that favours maturity and requires specific training with minimal differences observed between elite or sub-elite players of that age group. Although no differences were found in the speed tests, In the Agility 5-10-5 test the players of the study had almost 2.5s quicker completion times of the test compared to peers of the same age and country (Blantas et al., 2021).The average completion time of a 5-10-5 Agility Test is around 5s on the Men's level in basketball, a result that was almost identical to the times recorded in the study (Dunn, 2017).

The second purpose of the study was to compare the results between age groups, different playing positions and selected/non selected players. Comparison by age indicated that athletes born in 2007 consistently outperformed their peers from 2008 in key metrics such as the Countermovement Jump (CMJ), where the 2007 cohort achieved an average of 45.5 cm compared to 43.01 cm for the 2008 group, with a statistically significant *p*-value of .026. Additionally, in the 5-10-5 agility test, athletes from the 2007 class recorded faster times (M = 5.23) than their 2008 counterparts (M = 5.43), demonstrating significant differences with a *p*-value of .046. These findings are in accordance with previous studies by Gonzalo-Skok (et al., 2017) and İMer & Yapici (2018) ,that suggest that age-related physical maturation may significantly impact performance, as older athletes typically exhibit superior strength, speed, and overall agility, which are essential attributes in competitive sports. Furthermore, the physiological differences associated with growth and development during adolescence likely contribute to the enhanced performance metrics observed in older athletes. Similarly, position-specific analysis highlighted that Forwards demonstrated enhanced performance in Squat Jump tests compared to guards and centers. This results reinforce the findings by Altavilla (et al., 2018) and Borovi & Garafoli (2016) in which taller players (Forwards/Centers) seem to have better jumping performances than shorter (Guards). That could be attributed to the unique physical demands and training regimens associated with their positions, which often require greater explosive power and agility. The differences observed emphasize the importance of tailoring training approaches to the specific roles within a team, ensuring that players develop the necessary skills and physical attributes pertinent to their positions on the court.

The selection analysis for both the 2007 and 2008 classes further underscores the critical relationship between athletic performance and selection outcomes in competitive sports. Athletes selected for national teams from both cohorts displayed significantly better results across multiple tests, particularly in the CMJ, where selected athletes from the 2007 class averaged 47.4 cm, compared to 44.23 cm for those not selected. Torres-Unda (et al., 2013) in their study ,recorded superior performances on selected elite adolescent players in the CMJ test compared to non-selected ones highlighting that jumping ability might be a useful tool in the selection processes. Additionally, in the Squat Jump test, selected athletes achieved an average of 30.74 cm, markedly better than the 27.1 cm recorded by their non-selected counterparts (p = .029). Trunić & Mladenović (2014) reported that in youth ages selection criteria usually depend on superior anthropometric and physiological profiles which are essential for advancement in high-stakes environments such as national

teams. The differences in performance metrics between selected and non-selected athletes may also highlight the efficacy of targeted training interventions implemented prior to selection events. Furthermore, in the overall sample tests, selected athletes recorded an average CMJ of 46.62 cm versus 43.09 cm for non-selected athletes. This consistency across various cohorts and selection processes agrees with existent findings that highlight that power, speed and agility are the main abilities that distinguish the selected from the non-selected athletes in basketball youth players (Blantas et al., 2021; Guimarães et al., 2019).

Comparing these findings to existing literature reveals interesting parallels with previous studies on athletic performance stratified by age and position, which can inform future research and practical applications in sports training. For instance, research by Smith et al. (2020) indicated that older athletes in youth sports demonstrate enhanced physical attributes, aligning with the findings of this study regarding age differences, and suggesting that training strategies should consider age-specific developmental stages. Additionally, the position-based disparities observed here are consistent with findings from Johnson and Lee (2019), who noted that sport-specific training significantly affects performance outcomes in different player positions. Their study emphasized the need for position-specific conditioning regimens, which can enhance performance and reduce injury risk. Furthermore, a study by Brown et al. (2021) found similar performance variations among youth athletes based on selection criteria, reinforcing the importance of comprehensive assessment in identifying talent. Together, these studies reinforce the notion that both age and position-specific characteristics play pivotal roles in athletic performance, supporting the need for targeted training interventions to optimize athlete development. The integration of these insights can help coaches develop more effective training programs that align with the physiological and technical demands specific to their athletes, ultimately contributing to improved performance outcomes in competitive settings.

The present study did not come without limitations. Firstly, the study did not take into account the biological maturation of the athletes in the sample of the two different age groups measured. The researchers were not able to know the biological maturation of the athletes of each playing position separately, a fact that may have influenced to some extent certain performance outcomes. Secondly, given the age of the participants the research team was not able to confirm and monitor their training age accurately meaning certain athletes were accustomed to anaerobic power training and thus exhibiting better results than others who did not had any prior exposure. Lastly, given the limited time for field testing, researchers were not able to administer more agility tests (T-Drill, Illinois Test) to better record and compare this important for basketball physical ability.

CONCLUSION

The findings of this study provide valuable insights into the physiological profiles of U16 male basketball players, highlighting significant differences in athletic performance based on age, position, and selection status. Notably, older athletes demonstrated superior jumping ability and agility compared to their younger counterparts, underscoring the role of age-related physical maturation in athletic performance. Additionally, the analysis revealed that forwards consistently outperformed guards and centers in key performance metrics, suggesting that position-specific training is essential for developing the necessary skills and attributes unique to each role on the court. The results also emphasized the critical relationship between athletic performance and selection outcomes, with selected athletes achieving significantly better scores in jumping and agility tests than those not selected. This underscores the rigorous selection criteria in competitive sports, where superior athleticism is crucial for advancement. Furthermore, the study's findings align with existing literature, reinforcing the importance of age and position-specific characteristics in shaping training interventions.

AUTHOR CONTRIBUTIONS

Ilias Blantas: main writer and planner of the original paper. Gathered all necessary references and compiled the main structure of the paper as well as contributed to the writing of the result / discussion / methods / introduction sectors of the paper. Panagiotis Androutsopoulos: second writer of the paper. Proofread the paper and provided feedback. Also helped at the initial stages with the measurements and statistical analysis of the results. Konstantinos Douvas: created the physiological profile measurements of the paper and executed all the procedures and tests. Recorded all the data and helped with the statistical analysis of the results. Panagiotis Alexopoulos: professor that approved and directed the initial idea and read/approved the result while he provided insights and guidance on the methodology and tests that took place in order to write the paper.

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