ABSTRACT:

The purpose of the study is to compare the physical, motor and physiological characteristics of students between the ages of 12 and 14 who regularly perform athletics and wrestling sports with non-sports students, and explore their effect on the sports students’ level of branching. The research group was selected among student at Keçiören Mecidiye Secondary School and Alaeddin Ozdenören Imam Hatip Secondary School in Ankara. A total of 47 male students formed the research group 15 students between the ages of 12 and 14 who are engaged in regular athletics training, 17 students who regularly perform wrestling and 15 volunteers in the same age group who do not sports. Measurements included age, height, body weight, Agility (T-test), hand grip strength, standing jump, vertical jump, body fat percentage, flamingo balance, flexibility, 1 min shuttle, BMI, 30 m speed run, 1000 m run-walk tests. The analysis of the data was evaluated according to the results of the Levene test for homogeneity. If the result was homogeneous, ANOVA method was used. Otherwise Kruskal Wallis comparison test was performed. In variables whose averages differed as result of multiple comparisons, the TUKEY test was used to find which groups these differences stemmed from. The results of agility, right and left hand grip strength, flexibility, 1 min shuttle, Body Mass Index (BMI), 30 m speed, 1000 m run-walk tests were statistically significant. However, the results for height, weight, age, long jump, flamingo balance, body fat percentage, vertical jump tests were not statistically significant. When we look at the results, it is found that the best results for 1000 m run-walk, 30 m speed run, agility (T-test), height, long jump, vertical jump were recorded in the athletics group. It has been observed that the wrestler group has better results in body weight, body fat percentage, grasp strength, flamingo balance, l
minute shuttle and flexibility parameters. The values of the control group were found to be lower than those who were engaged in athletics and wrestling as they did not exercise regularly. When the differences between the groups are evaluated, it can be said that there is a tendency towards branching in a branch in students between the ages of 12 and 14.

**KEY WORDS:** Branching, Athletics, Wrestling, Children

**INTRODUCTION**

As sports a significant role in children’s growth, maturation, cognitive development and socialization, it should be a part of their lives at early ages. [1]. The studies attempting to identify children’s physical, motor and physiological characteristics are conducted for two main reasons. The first is to determine and improve children's physical fitness in terms of health. The second is to improve the community health. Therefore, studies on the subject are continuously increasing and the roots of health problems in adults are examined in relation to the results of these studies. The reason for these studies might be branching at early ages to increase sportive success is highly important [2]. Today, we need talented athletes to compete in the international arena and take our place in the world in this field. However, training such athletes requires the selection of individuals fit for sports as well as systematic and coordinated efforts [3]. Talent identification is the selection and grouping of young athletes to direct lead them to the right sports branch. Athlete selection is among important studies that sports scientists have been working on for many years. Based on the training of a good athlete, we try to push the limits of human performance [4]. Early identification, continuous observation and guidance of human talent as the basic element have become an important issue. With developing training systems, the majority of subjects emphasized and studied most by sport scientists today tries to explore how the basic requirements to achieve top level performance in sports are fulfilled [5]. Body measurements, body structure and composition are significant factors that affect strength and performance. Branching or talent identification in children depends on muscle strength, age, gender, maturation level, level of previous physical activity and body measurements [6]. In a study conducted on girls and boys between the ages of 7 and 12, it was discovered that bone age plays an important role in development process in jumping, sprint and throwing activities that require speed, strength and coordination. Children acquire modes of action that are compatible with these basic skills at the ages of 6 and 7 and their development in these skills acquired at childhood period continues in later ages as well [7]. Significant progress is made in performance skill between the ages of 7 and 14. It is such a development period that children rapidly correct, improve the modes of action they already know and acquire new ones quickly. Therefore, this development period is significant in terms of both performance and the best learning age of children. Physical performance reaches to a level that can be ideally identified at this age. Particularly speed, aerobic endurance and agility improve in this period [8]. From a physiological viewpoint, speed is considered as a motional ability depending on the rapid working capacity of muscles and nervous systems. The actions in preschool period occur slowly and develop in a rough from. However, the general speed of motion improves between the ages of 5 and 7. This improvement clearly manifests itself with appropriate exercises and particularly in running activity. Reaction speed relatively improves towards the end of this period. The most significant progress in the development of the speed of action is made between the ages of 6
and 9 during the first school period. A good reaction speed can be seen between the ages of 9 and 10. Reaction speed reaches to the level of adult rates in the second school period. Movement frequency reaches to the highest levels at the age of 12. Between the ages of 11, 12 and 14, high rates of increase are observed in the speed of motion, reaction speed and basic speed in complex movements. In adolescence period, the speed features reach to the maximum levels depending on the mobility of neural processes and complete their development [9]. Endurance shows a rapid increase at the ages of 11 and 12 in boys and this increase slows down after the age of 45. After endurance reaches the highest point, it is maintained for 3-5 years. With aging, it starts to lessen as result of the alterations in respiratory and circulatory systems [10]. Agility is the control and coordination ability to keep the body and joints in the right position in space during quick changes of direction in a series of movements [11]. To improve agility, both general and special exercises are performed in a certain period of time. For example, versatility should be given importance by benefiting from diverse general movement models to improve the basis of motor skills at the ages of 5 and 8. This period of building a structure to learn movement models, timing and coordination should focus on planned exercises [12]. Studies indicate that beginning sports at early ages is closely related to success in sports branches [13]. It is indisputable reality that the infrastructure of childhood training has an important place in the main basis of achieving high level performance. Physical education to be performed to children can be a determinant of sporting success in their branches for the future. The physical, physiological and motor development of the regularly trained children's athletes and the fitness of their choice to the sports branch are also very important.

Therefore, this study aims to compare certain physical, motor and physiological characteristics of children who are regularly engaged in athletics and wrestling sports at the ages of 12 and 14, with children who do not do sports, and examine and evaluate the impacts of the characteristics of these children on specializing in a branch.

METHODS

The research group of the study consists of a total 47 male students studying at Keçiören Mecidiye Secondary School and Demetevler Alaeddin Ozdenören Imam Hatip Secondary School in Ankara during the study. Of the participants, 15 students between the ages of 12 and 14 were engaged in regular athletics training, 17 students were regularly engaged in wrestling and 15 volunteers in the same age group did not do sports. After all necessary explanations about the tests were made, both the students and their parents signed voluntary participation forms. The students were tested and their measurements were taken in the course hours at their own schools. In tests and measurements for the students in control group, students who had passed the ages of 12, 13 and 14 during the test and measurement dates and had no health disadvantage to prevent them from participating in physical education and sports class were assessed. The students who were actively engaged in a sports branch for more than one month were not assessed. In the assessments, age (year), height (Holtain marka stadiometre), body weight (Holtain marka stadiometre). Agility (T-test) Set out four cones as illustrated in the diagram above (5 yards = 4.57 m, 10 yards = 9.14 m). The subject starts at cone A. On the command of the timer, the subject sprints to cone B and touches the base of the cone with their right hand. They then turn left and shuffle sideways to cone C, and also touches its base, this time with their left hand. Then shuffling sideways to the right to cone D and touching the base with the right hand. They then shuffle back to cone B touching with the left hand, and run backwards to cone A. The stopwatch is stopped as they pass cone A [14, 15]. Hand grip strength (Holtain brand hand dynamometer), standing long jump, vertical
jump, body fat ratio (Tanita BC-418 MA), Flamingo balance Stand on the beam with shoes removed. Keep balance by holding the instructor's hand. While balancing on the preferred leg, the free leg is flexed at the knee and the foot of this leg held close to the buttocks. Start the watch as the instructor lets go. Stop the stopwatch each time the person loses balance (either by falling off the beam or letting go of the foot being held). Start over, again timing until they lose balance. Count the number of falls in 60 seconds of balancing. If there are more than 15 falls in the first 30 seconds, the test is terminated and a score of zero is given [16]. Flexibility (Sit and reach test for flexibility; This test involves sitting on the floor with legs stretched out straight ahead. The soles of the feet are placed flat against the box. Both knees should be locked and pressed flat to the floor - the instructor may assist by holding them down. With the palms facing downwards, and the hands on top of each other or side by side, the subject reaches forward along the measuring line as far as possible. Best result of two trials is recorded [17]. 1 min shuttle, BMI (Tanita BC-418 MA), 30m speed run assessment were performed by photocells that placed in the starting and finishing lines. The subjects performed the 30 m maximum speed test, and they warmed up in the usual manner for 10-15 minutes before starting the test. Each participant performed two trials for each of the tests with 5 minutes of rest between them, and better of two trials was selected for analysis [18]. 1000 m run and walk (min/sn) tests were performed.

STATISTICAL RESULTS

The difference between the averages of T-test (agility) results for athletics, wrestling and non-sports students groups are statistically significant. When the averages were examined, it was found that the students in the athletics group had the best results with 9.56±0.65 while the wrestler students had the worst results with 10.98±0.88. The difference between the averages of hand grip strength (left) for athletics, wrestling and control groups is statistically significant. While the control group students had the lowest result with 24.36±6.44, the wrestler students had the highest result with 34.12±10.36. The difference between the averages of hand grip strength (left) for athletics, wrestling and control groups is statistically significant. While the control group students had the lowest result with 23.72±6.14, the wrestler students had the highest result with 30.89±9.42. The difference between the averages of flexibility values for the athletics, wrestling and control group is also statistically significant. While the control group students had the lowest result with 16.80±5.05, the wrestler students had the highest result with 25.53±6.23. The difference between the averages of 1 minute shuttle values for the athletics, wrestling and control groups is statistically significant as well. While the control group students had the lowest result with 33.93±3.61 at average, the wrestler students had the highest result with 48.59±9.62. As for BMI values, the difference between the averages of the athletics, wrestling and control groups is statistically significant. The control group students had the lowest result with 18.78±2.75 at average and the wrestler students had the highest result with 21.89±4.59. The difference between the averages of 30 m speed run values for athletics, wrestling and control groups is also statistically significant. While the athletics students had the lowest result with 4.96±0.41 at average, the wrestler students had the highest result with 5.38±0.60. Finally, the difference between the averages of 1000 m run-walk values for athletics, wrestling and control groups is also statistically significant. While the athletics students had the lowest result with 4.02±0.39 at average, the wrestling students had the highest result with 4.58±0.64.
**DISCUSSION**

In the study, the comparison results between the groups subjected to t-test, right and left hand grip strength, flexibility, 1 min shuttle, BMI, 30 m speed and 1000 m run-walk tests were statistically significant: p<0.05. However, there were no statistically difference between the groups in terms of the results of height, weight, standing long jump, age, flamingo balance, body fat percentage and vertical jump tests: p>0.05. When we look at the results, it is seen that the best results for 1000 m run-walk, 30 m speed run, agility (t-test), height, standing long jump, vertical jump were recorded in the athletics group. It has been observed that the wrestling group has better results in body weight, body fat percentage, hand grip strength, flamingo balance, 1 min shuttle and flexibility parameters. The values of the control group were found to be lower than those who were interested in athletics and wrestling because they did not exercise regularly. When the differences between the groups are evaluated, it can be said that there is a tendency towards branching in a branch between the ages of 12 and 14.

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**Table 1: Comparison difference between three groups**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Athletics N=15</th>
<th>Wrestling N=17</th>
<th>Control Group N=15</th>
<th>Difference Between Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>13.07±0.26</td>
<td>13.12±0.26</td>
<td>13.13±0.64</td>
<td>--</td>
</tr>
<tr>
<td>Body Weight (kg)</td>
<td>48.98±8.52</td>
<td>54.0±15.62</td>
<td>13.13±0.64</td>
<td>--</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>160.8±9.41</td>
<td>159.18±10.79</td>
<td>160.73±8.41</td>
<td>--</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>18.8±1.89</td>
<td>21.89±4.59</td>
<td>18.78±2.75</td>
<td>a-w / c-w</td>
</tr>
<tr>
<td>Balance (sec)</td>
<td>5.93±3.81</td>
<td>5.47±3.62</td>
<td>6.13±3.78</td>
<td>--</td>
</tr>
<tr>
<td>Agility T-test (sec)</td>
<td>9.56±0.65</td>
<td>10.98±0.88</td>
<td>6.13±3.78</td>
<td>a-w / w-c</td>
</tr>
<tr>
<td>Body Fat (%)</td>
<td>17.06±4.03</td>
<td>17.04±4.72</td>
<td>19.55±4.95</td>
<td>w-c</td>
</tr>
<tr>
<td>Vertical Jump (cm)</td>
<td>36.4±8.05</td>
<td>29.88±8.77</td>
<td>29.88±8.77</td>
<td>--</td>
</tr>
<tr>
<td>Right Hand Grip Strength (kg)</td>
<td>26.27±7.48</td>
<td>26.27±7.48</td>
<td>24.36±6.44</td>
<td>a-w / g-c</td>
</tr>
<tr>
<td>Left Hand Grip Strength (kg)</td>
<td>25.25±7.31</td>
<td>30.89±9.42</td>
<td>23.72±6.14</td>
<td>--</td>
</tr>
<tr>
<td>Standing Long Jump (cm)</td>
<td>183.07±22.95</td>
<td>171.47±30.03</td>
<td>171±22.13</td>
<td>--</td>
</tr>
<tr>
<td>Flexibility (cm)</td>
<td>21.74±6.61</td>
<td>25.53±6.23</td>
<td>16.80±5.05</td>
<td>w-c</td>
</tr>
<tr>
<td>1-min Shuttle (number of repeats)</td>
<td>38.60±5.38</td>
<td>48.59±9.62</td>
<td>33.93±3.61</td>
<td>a-w / w-c</td>
</tr>
<tr>
<td>30-m Speed Run (sec)</td>
<td>4.96±0.41</td>
<td>5.38±0.60</td>
<td>5.34±0.39</td>
<td>a-w</td>
</tr>
<tr>
<td>1000-m Run-Walk (min/sec)</td>
<td>4.02±0.39</td>
<td>4.58±0.64</td>
<td>4.54±0.43</td>
<td>a-w / a-c</td>
</tr>
</tbody>
</table>
In the research group, the athletics students' height was found as 160.80±9.41 cm, the wrestling students' height was found as 159.18±10.79 cm and the height of the students not doing regular sports was found as 160.73±8.14 cm. We can say that all students in this age group are close to the ideal standards. The athletics students' body weight was found as 48.98±8.52 kg, wrestling students' body weight was found as 54.00±8.52 kg and bodyweight of the students not doing regular sports was found as 48.64±8.78 kg. In the General Directorate of Youth and Sports (GDYS) According to the norm developed with respect to age distribution in a study based on talent scan in athletics in Turkey, 33.8-38.8 kg for 12 years old (n=680) boys, 42-44 kg for 13 years old and 56-60 kg for 14 years old are regarded as normal values [19]. Yusufre ISOğlu (2009) found the average weight of children as 43.80±8.29 kg in his study on the impact of regular training on anthropometric development of athletes aged between 12 and 14 [20]. In the research group, the athletics students' body mass index (BMI) was identified as 18.79±1.89 kg/m², wrestling students' BMI was identified as 18.787±1.89 kg/m² and BMI of the non-sports students was identified as 18.780±2.75 kg/m². The difference between the students engaged in wrestling and athletics branches can be due to the specific nature of the exercises they perform. However, there is no significant difference between the athletics group and students not doing regular sports. This can be a result of the fact that the athletics students are engaged in aerobic exercises rather than strength training. The athletics students' body fat percentage (BFP) was found as 17.060±4.03%, wrestling students' body fat percentage was found as 17.041±4.72% and body fat percentage of the non-sports students was found as 19.553±4.95%. Sevinç (2008) identified that pre-test average of BFP of %17.81±5.15 fell to 14.91±6.37% following football skill trainings that were applied to children at the ages of 10 and 14 [21]. In the study, the reason for the fact that the student groups doing athletics and wrestling sports have lower body fat percentage compared to the students not doing regular sports could be that the athletics and wrestling students have been engaged in more physical activity than those not doing regular sports.

In the study, the athletics students' flamingo balance test result was found as 5.93±3.81 sec. The flamingo balance test result of the wrestling students was found as 5.47±3.62 sec and the flamingo balance test result of the students not doing regular sports was found as 6.13±3.78 sec. It is known that static and dynamic postural controls are important and necessary for motor skills [22]. In their study conducted on 31 children aged between 10 and 12, Moraru, Neculaes, & Hodorca (2013) concluded that children regularly engaged in sports had higher strength and balance skills, compared to non-sports children and exercise led to the increase of strength and balance skills [23]. Siriphorn ve chamonchat (2015) found that lower extremity muscle strength increased and balance skills improved at the end of an 8-weeks balance exercise [24]. As was found in different studies, it can be said that exercise affects balance improvement. In the research group, the reason that the wrestler students have better balance values compared to the other groups might be due to the relationship between strength and balance. In the study, T-test (agility) results were found as 9.5633±0.65 sec for the athletics students, 10.9847±0.88 sec for the wrestling students and 9.9387±0.54 sec for the non-sports students. One of the important reasons for the athletics students' better variable values could be that they perform running and jumping exercises and exercises improving agility in their trainings. In the study, the athletic students' vertical jump results were found as 36.40±8.05 cm. It is 29.88±8.77 cm for the wrestling students and 34.00±8.38 cm for the students who do not do regular sports. Bencke vd., (2002) In a study conducted on elite and non-elite children to indicate the impact of different trainings in different sports branches and performance levels on muscle strength and anaerobic power, and its relationship with growth and maturation in
children, no difference was found between the groups in terms of vertical jump in handball players [25]. In the study, the reason for the fact that the athletics students have better results compared to the wrestling students and non-sports students can be due to special athletics trainings. The hand grip strength (right) of the athletics students in the study were found as 26.267±7.48 kg while it was found as 34.118±10.36 kg for the wrestler students and 24.360±6.44 kg for the non-sports group. In addition, the hand grip strength (left) was found as 25.2533±7.31 kg for the athletics students, 30.8882±9.42 kg for the wrestling students and 23.7220±6.14 kg for the students not doing regular sports In the General Directorate of Youth and Sports (GDYS) study conducted based on talent scan in athletics in Turkey, according to the norm developed based on age distribution, 17-18 kg for right and 16-18 kg for left for 12 years old boys (n=680), 24.1-28.2 kg right and 22.4-26.8 kg for left for 13 years old boys, and 33.8-38.8 kg for right and 32.7-37.2 kg for left for 14 years old boys are regarded as normal values in hand grip strength [19]. Our study particularly the wrestling students' hand grip strength values are higher in comparison with the athletics students and non-sports student. The reason for that might be due to arm and hand muscle development as wrestlers do more strength trainings for their branch. The standing long jump results of the athletics students were found as 183.07±22.95 cm while it was found as 171.47±30.03 cm for the wrestling students and 171.00±22.13 cm for the students not doing regular sports. In the General Directorate of Youth and Sports (GDYS) study conducted based on talent scan in athletics in Turkey, according to the norm developed based on age distribution, 137-146 cm for 12 years old, 173-184 cm for 13 years old and 191-204 cm for 14 years old children are regarded as normal values in standing long jump tests. In the study, the flexibility result was found as 21.740±6.61 cm for the athletics students, 25.529±6.23 cm for the wrestling students and 16.800±5.05 cm for the students not doing regular sports [19]. Study conducted based on talent scan in athletics in Turkey, according to the norm developed based on age distribution, 16-18 cm for 12 years old (n=680) boys was found as normal values. İbiş (2002) On male football players at the ages of 12 ad 14 at summer schools, the flexibility values of children in the test group was found as 30.94 cm, and it reached to 32.56 cm after training Therefore, the wrestling students’ higher flexibility values might be due to exercise. The low flexibility values in non-sporting students positively affected the sporting students’ flexibility [26]. In the study, 1 min shuttle result for the athletics students was found as 38.60±5.38 sec while it was found as 48.59±6.62 sec for the wrestling students and 33.93±3.61 for the non-sports students. In the General Directorate of Youth and Sports (GDYS) study conducted based on talent scan in athletics in Turkey, according to the norm developed based on age distribution, 28-32 sec was found as the normal value for 12 years old boys (n=680). In our study, the reason for the wrestling students' better performance levels compared to the athletics students and non-sports students might be due to their stronger abdominal muscle characteristics. On the other hand, the reason for the non-sports students' lower performance levels might be that the type of exercise has an impact on the students. 30 meters speed run values were found as 4.9560±0.41 sec for the athletics students, 5.3771±0.60 sec for the wrestling students and 5.3367±0.39 sec for the non-sports students. As part of the study, several studies on 30 m speed run were examined. According to norm developed with respect to age distribution in the GDYS (2010) study conducted based on talent scan in athletics in Turkey, 6.04-5.78 sec for 12 years old (n=680) boys, 4.95- 4.81 sec for 13 years old boys and 4.66-4.56 sec for 14 years old boys are regarded as normal values [19]. Yıldız (2002) In a study conducted on the motor and physical features of male national badminton players aged between 11 and 15 [27]. Found 30 m speed run test score as 4.89 sec. In our study, the athletics students’ better variable values compared to the wrestling
students and non-sports students can be due to the specific nature of the exercises athletics students perform. In the study, 1000 m run-walk test result for the athletics students was found as 4.0167± min/sec while it was found as 4.5841±0.64 min/sec for the wrestling students and 4.5407±0.43 min/sec for the non-sports students. The athletics students' better values compared to the wrestling students and non-sports students can be due to the specific nature of the exercises they perform.

In the study, the physical, physiological and motor characteristics between the two branches were examined and differences were identified between the parameters in the branches. Accordingly, the athletics students showed better performance in speed and agility. Considering their motor development, they were found faster than the other students. On the other hand, the wrestling students had better performances in terms of strength due to the exercises they perform and their physical characteristics. When the differences between the groups are assessed, it is seen that there is an inclination towards branching in a branch around the ages of 12 and 14. When the three groups are assessed together, it is found that the control group is far behind the others in terms of physical, physiological and motor features that should be observed in this age group. Although they might not necessarily be for a particular branch, increased physical activity and exercise levels can be recommended for children in this age group to support a healthy lifestyle and development.

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REFERENCES