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RESEARCH ARTICLE

AGILITY PERFORMANCE RELATIONSHIP BETWEEN STRENGTH PERFORMANCE IN YOUNG VOLLEYBALL

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ABSTRACT

In the study, it is aimed to investigate the relationship between the strength performance values of the female volleyball players and the agility performance values.42 female volleyball players who have been playing licensed in İstanbul Pertevniyanl Sports Club for at least 2 years have participated voluntarily. Athletes are required to participate in any physical activity until 24 hours before the measurements. Measurements were made in two steps. First, the athletes' height and weight measurements were taken. In the second phase, rats, leg strength, plank, and agility performance in Illinois and Pro-Agality were measured by random selection in the test area established by experts. Statistically significant differences were found between female agile measurement scores and leg strength (-0.625 *) and plank (0.583 *) variables of female volleyball players (p <0,05 *). However, no statistically significant difference was found between the back strength (-0,152) and the change. Statistically significant differences were found between Pro-Agality agility measurement scores and leg force (0,712 *) and plank (0,692 *) variables (p <0,05 *). However, no statistically significant difference was found between the back strength (0,052) and the change.As a result, there was a significant relationship between the leg strength and plank (muscle strength) performance values of the female volleyball players and their agility.

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INTRODUCTION

Volleyball is a game which needs to played inside in a narrow space (Kluka and Dunn, 2000). When you think that there are 6 athletes in the game, the space which athletes have dropes even more. So, in sudden movements, players are expected to defend and attack by interfering with the ball in a narrow region (Briggs 2007). Volleyball is intertwined with performance measurements and agility due to the game's character. In volleyball players, sudden acceleration and deceleration exercises must be done to increase efficiency and improve skills. Also, you need to change direction quickly to be able to defend the game in the volleyball. Finally, in order for the players to be successful in the field, besides making players powerful with protecting their power, it is necessary to control the body in a suitable mechanics (Sayers 2000).Agility is defined as the ability to change direction quickly, maintaining balance without loss of speed (Lemminkve ark, 2004). Hazar (2005) defines agility as a rapid application of a skill. When agility definitions are examined, it appears that agility is defined by specific biomotor features.

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Agility in this context consists of these specific biomotor properties, and some of them also manifest themselves as being a feature that is significantly affected. As a matter of fact, the performance values in the volleyball game are as important as every sport. Agility plays a vital role in the volleyball, which is played quickly and in tight space. Agility is directly related to the force parameter. Strength is important for the nervous-muscle system to contract quickly and perform its task. For this reason, it is important for us to be able to demonstrate the relationship between force values and agility.

METHODS

42 licensed female volleyball players who played for Istanbul Pertevniyal Sports Club for at least 2 years participated in the research voluntarily. Athletes are required to participate in any physical activity until 24 hours before the measurements. Measurements were made in 3 steps. First, the athletes' height and weight measurements were taken. Afterwards, the athletes were asked to warm up for strength and agility measurements. At the test site established by experts in the third stage, random selection and agility values measurements were taken.

Height: The height measurements were taken with naked feet, standing up and straight during deep inspiration while a thin stick parallel to the floor is touching the top of the head.

Measurements were taken from the bottom of the feet to the top of the head with a sensitivity of 0.5 cm. (Tamer, 2000).

Weight: The weight measurement was made on lightweight sporty clothes and over 100 grams of precision weighing. Measurements taken on an empty stomach and standing (Tamer, 2000).

Strength: Measurements were taken with leg and back (Takei brand digital) dynamometer. When leg and back measurements of the subjects are taken, the knees are pulled upwards by using the back muscles at the maximum level in the position of pulling the dynamometer bar vertically with the hands, with the arms tilted, the back straight position and the body slightly inclined forward by placing the legs in the area above the dynamometer stand in the bent position (Tamer, 2000). The treadmill was asked to apply the highest force with the hand-grip device gripped in the palm of the hand by grasping one hand in the standing posture position. The subjects were squeezed as hard as possible with the hand of the dynamometer without moving the arm in any way, the triplicate end result averages were taken, and the average obtained after three repetitions was recorded as the test result (Tamer, 2000).

Illinois Agility Test: A test track consisting of three lines is laid out on a straight line with a width of 5 m, a length of 10 m and a width of 3.3 m in the middle. The test consists of a slalom run between 40 m straight, 20 m long columns with 180 º turns every 10 m. After the test track has been prepared, a two-port photocell electronic stopwatch system is installed, which measures the start and end with a precision of 0.01 s. They are allowed to run 3-4 trials on the low temp after the demonstration of the course before the test is introduced and the necessary explanations are made. After that, the subjects will be warmed up and stretching exercises for 5-6 minutes in their low temp. The subjects exit from the starting line of the test track, while the face is in the lying position and the hands are in contact with the ground at shoulder level. The track closing time is recorded in seconds. With complete rest, the test is repeated 2 times and the good value is recorded (Miller, 2006).

Pro-Agility Agility Test: The pro-agility agility test area, also known as the 20-yard running test, is determined by placing the markers on the left and right of the starting line at 5 yards (4.57 m). The photocell door is placed on the starting line. Repeated switching times can be taken on this display. The participant is placed on the starting line before the application starts. When ready, touch the mark on the right and then the mark on the left to finish the test by passing through the starting line (Bayraktar, 2013). In the analysis of the obtained data, descriptive statistics of all variables were made as Mean Standard deviation. Then, relations between agility test scores and force variables were determined by Pearson's correlation coefficient. The data were made in the statistical program, p = 0.05 significance level was used.

RESULTS

Table 1. Age, height, weight and sport year chart of the athletes

Variable	n	Mean± Std.
Age (years)	42	17,11±2,5
Height (cm)	42	165,31±1,8
Weight (kg)	42	62,20±55
Sports Year (year)	42	4,1±0,22

Cm: Centimeter, Kg: Kilogram

Table 2. Relationship between illinois and Pro agility test scores and age, height, weight and sport year

Variable	Age (years)	Height (cm)	Weigh t (kg)	Sports Year (year)
Illinois Test (sec)	-0,045	-0,245	-0,189	0,012
Pro Agility (sec)	-0,025	-0,323	0,238	0,042

Sec: Seconds, Cm: Centimeter, Kg: Kilogram

Table 3. Relationship between Illinois and Pro Agility scores and forces

Variable	BackStrength (lbs)	LegStrength(l bs)	Plank (sec)
Illinois Test (sec)	-0,152	-0,625*	0,583*
Pro Agility (sec)	0,052	0,712*	0,692*

P < 0.05 *, Sec: Seconds, lbs: Liber

DISCUSSION AND CONCLUSION

The relationship between agility values and strength values of 42 female volleyball players aged 17.11 ± 2.5 years, 165.31 ± 1.8 cm, 62.20 ± 55 kg, and 4.1 ± 0.22 years were investigated. There was no significant correlation between the illinois agility measurement scores of the female volleyball players and the age (-0.045), height (-0.245), weight (-0.189), and sport (0.012) variables. There was no significant difference between Pro Agility measurement scores and age (-0.025), height (-0.323), weight (0.238) and sport years (0.042).Statistically significant differences were found between the Illinois measurement scores of the athletes participating in the study and the leg strength (-0.625 *) and plank (0.583 *) variables (p <0.05 *). However, no statistically significant difference was found between the back strength (-0.152) and the change. Statistically significant differences were found between the Pro Agility measurement scores of the female volleyball players and the leg strength (0.712 *) and plank (0.692 *) variables (p <0.05 *). However, no statistically significant difference was found between the back strength (0.052) and the change. Height and weight investigations were done on volleyball players (Ergül, 1995, Hakinen, 1989; Cavas et al., 2004, Koç et al., 2007) and their relationship with selected parameters. In our study, the relationship between agility values and age, height, weight and sport year variables was examined. There were no differences between these variables. Moreover, when the literature is examined, it is seen that the physical fitness of practiced training or athletes is statistically significant when considering the studies on agility (Piper, 2009; Royer, 2008; Molenaar, 2009). The findings of our study support the literature.

In conclusion, some exercises, such as sudden stop, exit, and change of direction, which control muscular spindles, tendons, tendons, joints, joints, balance and body position and affect the vast majority of sports activities through affecting neuromuscular adaptation, include agility (Nikseresht, 2014). There was a significant difference between the agility values in our study and the plank measurements taken to measure leg strength and muscular strength. Indeed, sudden turns within agility show that leg strength and muscular endurance are important in stops and exits. The back strength was observed to have no effect on the agility parameter. Moreover, there was no significant difference between the variables of age, height, weight and sporting experience of the athletes. It is thought that coaches' training programs to improve leg strength and muscular endurance can increase the agility performance of athletes.

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