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The relationship between agility and orientation ability in judoka children

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Abstract

Agility can be defined as the ability which allows to act and alter aspect quickly and effectively during a stimulation such as the movement of the ball or the movement of the rival athletes. Exercises which comprise agility drills are important components of training for many sports. Agility is one of significant components which contributes that athlete's exhibit optimal performance. There are several components that contributes to agility, such as training level, reaction time, strength, power, decision making and experience Orientation allows players and athletes to localize and identify the position and motion of his body or of a moving object (rival, teammate), as regards the space. The aim of this study was to determine the relationship between agility and orientation. Subject characteristics were as follows: age = 10.34 ± 1.40 years, height = 1.40 ± 0.08 m, and weight = 33.50 ± 9.25 kg. The sample included 67 judoka children in Turkey. The Pro-Agility test was set up and administered using the protocol outlined. Numbered medicine ball run test was used to determine orientation ability of the subjects. The study is observed that the orientation ability did affect the agility performance ($p<0.05$). Orientation ability ($r=0.365$) showed a positively significant ($p<0.05$) relationship. In conclusion, it is considered that the orientation ability did affect the agility performance and it can be said that the agility performance will also improve when the orientation ability of the athlete is developed.

Key words: Agility, child, judoka, orientation.

INTRODUCTION

Agility can be defined as the ability which allows to act and alter aspect quickly and effectively during a stimulation such as the movement of the ball or the movement of the rival athletes. Exercises which comprise agility drills are important components of training for many sports (1,7). Agility is one of significant components which contributes that athlete's exhibit optimal performance. There are several components that contributes to agility, such as training level, reaction time, strength, power, decision making and experience (9,12). A lot of athletes and their coaches prefer neuromuscular training methods that includes balance, agility, strength and power exercises to develop agility. Agility is of vital important to improve athletic performance (22). Power production is very important for ability to change direction and agility. Strength is essential to alter aspects during exhibiting agility performance. Most of agility exercises consist of quick acceleration, change direction and quick deceleration, besides power is significant for the skill to accelerate (4,11). Many studies that are on components which affect agility show that agility is most influenced by power and strength. There are some factors which might also affect agility, such as neural transmission delay, body mass and technique used in implementing a task which involves agility (14,23).

Orientation allows players and athletes to localize and identify the position and motion of his body or of a moving object (rival, teammate), as regards the space (13). Orientation ability is to analyses and alter the motion and position of the body in space and time associated with defined movement (18). This ability enables sportsmen to determine the whole body position and body's parts in space and time, as regards gravity. Orientation

contributes that players and athletes determine location of their own, other players, ball and other equipment in playing field (6). In especially team sports, the position of the ball, teammate, opponent constantly vary during the game. Athletes or players who have advanced orientation ability may optimally adapt changing situations. That sportsman perceives playing area which movements are performed in its and implement correct actions in the area is related to orientation ability (17). There is no study, regard as relationship between agility and orientation, besides whether orientation affects agility or not in academic literature. Therefore, the aim of this study was to determine the relationship between agility and orientation.

MATERIALS & METHODS

Experimental Approach to the Problem

To test our hypotheses, 67 judoka children from Turkey were assessed. These judokas were from different club. To determine the orientation and agility performance of judokas, an orientation ability test (Numbered medicine ball run test) and pro-agility test was used. These tests were performed on an indoor and conducted on a single day for each test subject

Subjects

Subject characteristics were as follows: age = 10.34 ± 1.40 years, height = 1.40 ± 0.08 m, and weight = 33.50 ± 9.25 kg. The sample included 67 judoka children in Turkey. Before data collection, all participants signed a university approved consent form. After receiving a detailed explanation of the study's benefits and risks, each subject signed an informed consent document that was approved by the local ethics committee.

Procedure

The Pro-Agility test

The Pro-Agility test was set up and administered using the protocol outlined by Harman et al. (5). The subjects started in a neutral stance, straddling the start line. On the "Go" command, the subjects were instructed to turn and sprint to the right 4.55 m (5 yd), touching the cone with their right hand. They then turned to the left and ran 9.10 m (10 yd) to the far cone. The subjects touched this cone with their left hand and then sprinted 4.55 m (5 yd) to the finish (Figure 1).

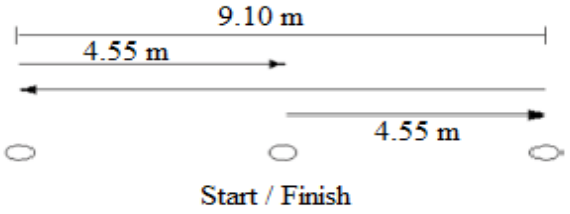


Figure 1. Pro-Agility test (5)

Numbered medicine ball run test

This test is to determine orientation ability of the subjects. All the medicine ball weighing 3 kg were arranged as shown in fig.1 on an even ground in a semi-circle with a distance of 1,5 m between the balls. The medicine ball weighing 4 kg was kept 3 m away from these medicine balls. Behind all the medicine balls of 3 kg weight, metallic number plates of 1 sq foot size were kept from 1 to 5. Before the start of the test, the subjects were said to stand behind the start-finish photocell gate which is behind the sixth medicine ball facing toward the opposite direction. On signal "ready-go" the subjects turn, crossing start-finish gate and run number called by tester and touched the medicine ball and run back to touch the sixth medicine ball, immediately another number was called. Similarly, a total of three times the number was called by tester. After subjects performed accordingly three times, they completed the test by crossing start-finish gate again. Using a photocell, the tester measures the time between the ''Go'' signal and crossing the finish gate in units of 0.1 seconds. Before the actual test was administered, one Practice trial was given to all the subjects (2,13,19).

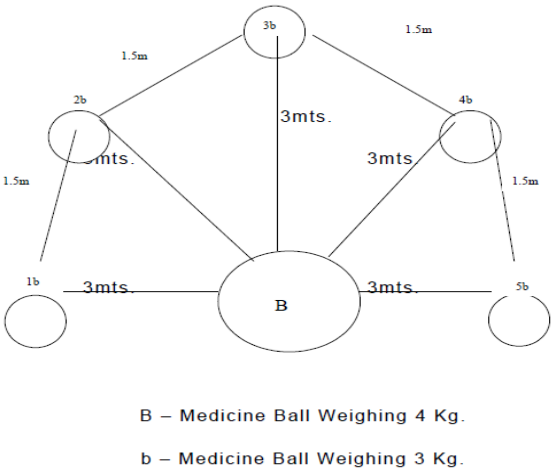


Figure 2. Numbered medicine ball run test subjects (2,13,19).

Statistical Analyses

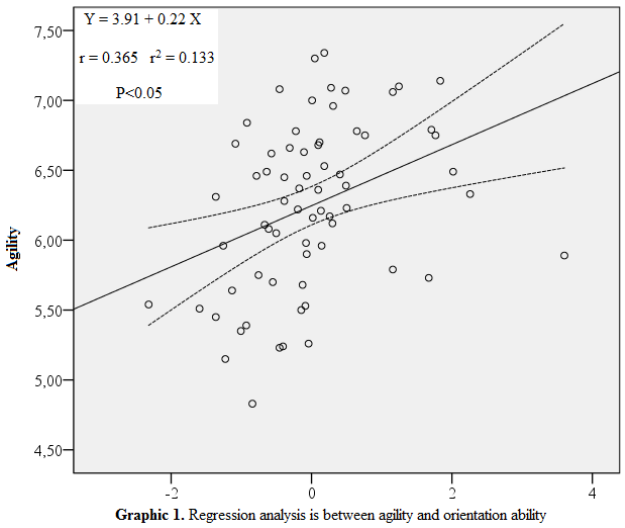
SPSS 22.0 IBM statistical software was utilized for data calculation and evaluation. According to the normality test results; Pearson correlation analysis was used to explain the relationship between the measurements. Linear regression analysis was utilized to determine the effects of orientation ability on agility performance. Significant level was taken as 0.05.

RESULTS

The mean (SD) age was 10.34±1.40 years, height was 1.40 ± 0.08 m, weight was 33.50 ± 9.25 kg, Orientation ability was 11.09 ± 1.04 s, and agility was 6.25 ± 0.60 s for the 67 judoka children (Table 1).

Table 1. Description for athletes (Mean ± SD).

Variables	N	Mean	SD
Age (years)	67	10.34	1.40
Height (m)	67	1.40	0.08
Weight (kg)	67	33.50	9.25
Orientation ability (s)	67	11.09	1.04
Agility (s)	67	6.25	0.60



Graphic 1. Regression analysis is between agility and orientation ability

When graphic 1 is analyzed, it is observed that the orientation ability did affect the agility performance ($p<0.05$). Orientation ability and agility ($r=0.365$) showed a positively significant ($p<0.05$) relationship.

DISCUSSION

This study was conducted in order to determine the relationship between agility performance and orientation ability for 10 years' judoka athletes. it is observed that the orientation ability did affect the agility performance ($p<0.05$). Orientation ability ($r=0.365$) showed a positively significant ($p<0.05$) relationship. When it is thought that agility performance is part of the play ability during competitive. Results of in this study is valuable in sport games.

Motor proficiency is positively associated with physical activity and negatively associated with sedentary activity in children, but there may be a threshold of motor proficiency above which children may be the most physically active. Children's motor proficiency may be an appropriate target for increasing physical activity in youth (25). In a previous study was found a significant relationship of balance ability with the judokas playing ability. Whereas no significant relationship in case of differentiation, orientation, reaction and rhythm coordinative abilities with judokas playing ability. In wrestlers, there was a significant relationship of balance and differentiation abilities with the wrestlers playing ability, while there was no significant relationship in case of orientation, reaction and rhythm abilities with wrestlers playing ability (16). Findings of same study showed that results of orientation ability of judokas in the age category of 18-25 years were 11.01 seconds as similar to results in our study. Puri et al. (15) researched to compare coordinative abilities of volleyball players in different age, and their study showed that results of orientation ability of children who were 14 years and below were similar to our results. İn a study researched by Singh (21), results for orientation ability of volleyball players were almost the same as being our results. Rana & Rajpoot (16) aimed to determine impact and role of selected coordinative abilities in racket sports in a study. According to results of the study, there was no a significant relationship between orientation ability, badminton playing ability and table tennis playing ability. In a study, Singh (20) indicated that orientation ability scores of all İndia interuniversity basketball players were 11.12±2.67 sec. Lohchab (10) compared coordinative abilities between volleyball and handball male players. Subjects who were 18 to 22 years participated in the study. Results of the study showed that test scores of volleyball players for orientation ability were 12.84±1.83 as well as test scores of handball players were 11.2±1.11sec. Jones and Lorenzo (8) investigated assessment of power, speed and agility in athletic preadolescent youth, and they reported that agility results of children who were about 11 years were 5.99 seconds for pro agility test. This result was similar to results in our study. İn a study, results pre-training protocol of subjects who

aged (Mean ± SD 13.06±0.7) for pro agility test were 5.6 seconds (3). In another study which aimed to examine relationship between sprinting, agility and jumping ability. Pro agility test results which belonged to 15 aged children showed that the children had 4.91 seconds test score (24). When previous studies were examined, it was observed that the playing ability and coordination abilities were examined but the relationship between agility and coordination abilities was not examined.

In conclusion, it is considered that the orientation ability did affect the agility performance and it can be said that the agility performance will also improve when the orientation ability of the athlete is developed.

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