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COMPARATIVE ASSESSMENT OF AGILITY IN GIRLS AGED 11–13 YEARS WHO PRACTISE OR DO NOT PRACTISE SPORTS

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ABSTRACT

The aim of the study was to test and assess agility of young girls aged 11–13 years and to find whether agility differs in girls who practise sports and in those who do not. The subjects of the study were 60 girls 30 of whom practised sports or attended workouts and 30 did not. To conduct the study, six agility tests taken from J. Dawes and M. Roozen's book *Developing Agility and Quickness* [1] were used. The study revealed differences in agility between the girls who practised sports and who did not. The comparison of mean results showed that in all six agility tests statistically significant differences existed between athletes and nonathletes. The mean results of girls who practised sports were statistically significantly better than those of the girls who did not. The greatest differences in comparison of the mean results of nonathletes and athletes were revealed in T-test and four corners jump test. Therefore, we recommend using them for assessment of agility in different physical ability test complexes, as they were the most informative among the tests studied. Based on our results, we can recommend to young people and their coaches that, although agility is believed to be an inborn ability, it should be developed by means of sports, motion and workouts. The results show that the girls who practise sports are more agile than those who do not.

Keywords: *agility; quickness; testing; adolescent*

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INTRODUCTION

Agility is a very essential ability in sports as it facilitates learning and perfection of new movements and techniques. In team games where the opponent has to be surpassed, agility depends on both visual and auditory perception, speed of taking a decision based on them, reaction speed, speed of movements and the ability to relocate the body in space as quickly as possible, anthropometric characteristics and muscular strength [12].

Agility as an all-embracing psychophysical quality is unique and individual like fingerprints. It enables us to rationally use the existing motor experience in unexpectedly changing conditions. In preschool children, it is namely agility that shows that some new movements have been fully learned and can be rationally used in everyday life. The expression of agility is closely related to conscious movement [9].

Agility is an inborn ability which can be developed to a certain extent by special exercises. It is impossible to find the only source of agility and to define it concretely. Agility is an unstable quality which is difficult to explain clearly, but it is always possible to define exactly and faultlessly whether a person possesses such an ability or not. It is the basis around which all the other necessary qualities that a real athlete needs are formed. In principle, agility is a harmonious relation between perception, coordination, speed, strength, and balance [5].

A year-long study conducted at V. N. Karazin Kharkiv National University confirmed the significance of developing of agility. The theme of their study was "Methods of developing agility in teaching the basics of volleyball". The test results at the end of the year showed that the indicators of agility had improved considerably. In parallel, there were positive changes in playing skills. The students with higher indicators of agility were quicker at acquiring technical elements and other tactical functions [2].

The overwhelming majority of tests for assessment of agility test the speed of changing the direction of movement [4]. An important requirement in many team sports is that the player should quickly change the direction of movement of the body and the extremities. The player's ability to use these manoeuvres in the game depends on many factors, for example visual processing, timing, reaction time, perception, and anticipation. Although all these factors characterise the player's agility on the court, the aim of most agility tests is to measure the rapid change in body direction and the body position on the horizontal level [4].

The aim of our study was to test and assess agility of young girls aged 11–13 years and to find whether agility differs in girls who practise sports and in those who do not.

MATERIAL AND METHODS

The subjects of the study were 60 girls 30 of whom practised sports or attended workouts and 30 who did not. The girls studied in form 6 of Tallinn Lasnamäe Gymnasium. The youngest girl was 11 years old and the oldest 13 years. The girls' mean age was 12 years (M = 12.27, SD = 0.578).

We selected six valid tests that characterise agility and that this age group can handle. Mostly, these tests measure the speed of body motion, reaction speed and the speed of relocation of the body in space. For each test, the aim of the test, the necessary means, how to set the test and the course of testing are described. The tests have been taken from the book *Developing Agility and Quickness* [1] but have been adjusted by Raini Stamm PhD to the size of the volleyball court and transferred to the metric system; initially the measurements in the tests were given in yards [10].

TESTS

1. Illinois test

Aim: To assess the students' technique and speed at running straight and at turns (see Figure 1).

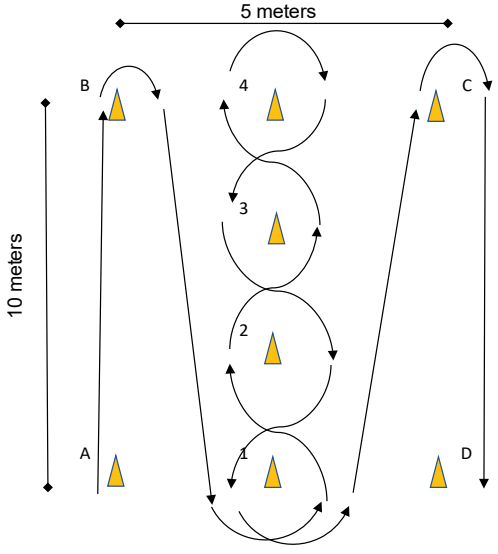

Figure 1. Illinois test [8].

2. 5-0-5 run test

Aim: To test speed at slowing down and accelerating and at changes of direction (see Figure 2).

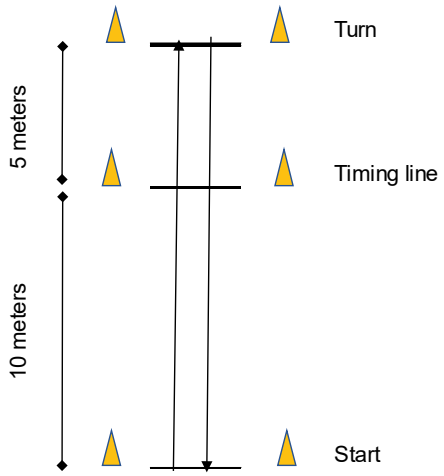

Figure 2. 5-0-5 run test [1, 10].

3. Pro shuttle test

Aim: To assess the testee's technique at changing of direction and the strength of legs (see Figure 3).

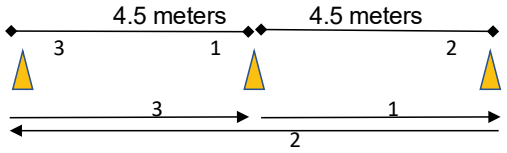

Figure 3. Pro shuttle test [1, 10].

4. Four corners test

Aim: To assess the skills of movement and changing direction while moving straight forwards, sidewards and backwards (see Figure 4).

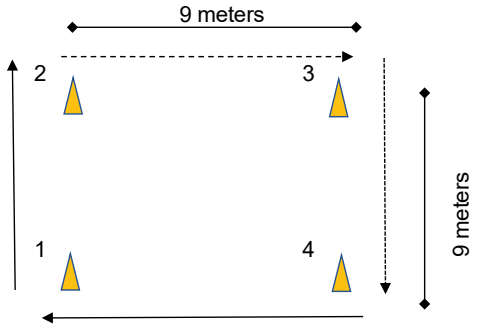

Figure 4. Four corners test [1, 10].

5. Four squares jump test

Aim: To test the speed of relocation of the body by jumps while having to fit oneself between the lines or avoid jumping onto the lines (see Figure 5).

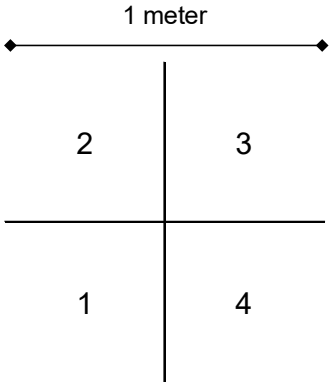

Figure 5. Four corners jump test [1, 10].

The athlete stands in front of the grid, face and shoulders towards square 1, in a strong balanced position, legs approximately shoulder width apart.

On command, the timekeeper starts the stopwatch, and the testee jumps into square 1. Thereafter, the testee continues jumping as quickly as possible into squares 2, 3 and 4, keeping the original direction of shoulders and hips during the whole test.

6. T-test

Aim: To test the testee's ability to accelerate and slow down, assess the speed of changing direction and the stability of the body when moving forwards, backwards and to the side (see Figure 6).

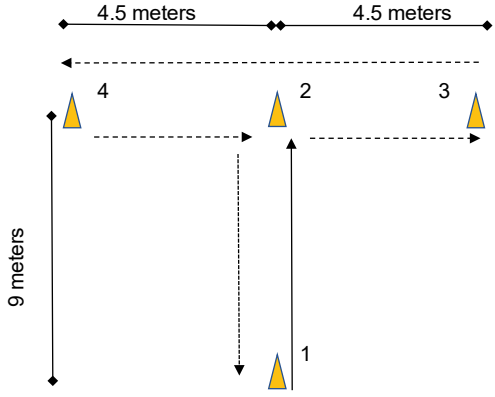

Figure 6. T-test [1, 10].

The original descriptions and procedures of conducting the tests are given in Jay Dawes and Mark Roozen's book *Developing Agility and Quickness* [1]. Descriptions of the tests in Estonian where some of the tests have been adjusted to the metric system can be found in the book *100 mängu ja testid võrkpallitreenerile ja liikumise õpetajale* (*100 games and tests for volleyball coaches and teachers of physical education*) [10].

RESULTS

The results show that the mean results of girls who practised spots were statistically significantly better than those of the girls who do not practise sports.

Illinois test results showed that the mean results of tests in the group of girls practising sports were better (M = 18.84, SD = 1.03) compared to the girls not practising sports (M = 20.7, SD = 1.37). The t-test revealed that the difference between the means was statistically significant, $t(29) = -5.89$; $p < 0.05$. In Illinois test, the girls practising sports were statistically significantly quicker than the girls not practising sports.

Four corners test results showed that the mean results of tests were better in girls practising sports (M = 11.60, SD = 0.51) compared to the girls not practising sports (M = 12.32, SD = 0.85). The t-test revealed that the difference

between the means was statistically significant, $t(29) = -4.32$; $p < 0.05$. In the four corners test, the girls practising sports were statistically significantly quicker than the girls not practising sports.

Four squares test results showed that the mean results of tests were better in girls practising sports (M = 27.05, SD = 4.45) compared to the girls not practising sports (M = 21.65, SD = 4.07). The t-test revealed that the difference was statistically significant, $t(29) = 7.09$; $p < 0.05$. In the four squares test, the girls practising sports were statistically significantly quicker, more precise, with better reaction and coordination than the girls not practising sports.

T-test results showed that the mean results of tests in the group of girls practising sports were better (M = 13.54, SD = 0.75) compared to the girls not practising sports (M = 18.55, SD = 2.07). The t-test conducted to assess statistical significance revealed that the difference between the means was statistically significant, $t(29) = -12.73$; $p < 0.05$. In the T-test, which assesses agility, the girls practising sports were statistically significantly quicker than the girls not practising sports.

Pro shuttle test results showed that the mean results of tests in the group of girls practising sports were better (M = 6.42, SD = 0.54) compared to the girls not practising sports (M = 7.80, SD = 0.85); the difference was statistically significant, $t(29) = -6.9$; $p< 0.05$. In the pro shuttle test, the girls practising sports were statistically significantly quicker than the girls not practising sports.

5-0-5 run test results showed that the mean results of tests were better in girls practising sports (M = 3.16, SD = 0.36) compared to the girls not practising sports (M = 4.10, SD = 0.66). The t-test to assess the differences between the mean results revealed that the difference was statistically significant $t(29) = -6.34$; $p < 0.05$. In the 5-0-5 run test, the girls practising sports were statistically significantly quicker than the girls not practising sports.

DISCUSSION

The current study researched agility in girls aged 11–13 years who practise or do not practise sports. 60 girls participated in the study, 30 of whom attended workouts and 30 did not. To conduct the study, six agility tests from J. Dawes and M. Roozen's book *Developing Agility and Quickness* [1] were used. Four tests out of six had been adjusted to the metric system by Raini Stamm PhD. The study revealed differences in agility between the girls who practised sports and who did not. Our sample of subjects was aged 11–13 years, as several authors have stated that this age is a favourable period for learning new movements,

for development of agility and for spatial and temporal perception of motor operations [6, 11]. We received interesting results – in all the six agility tests chosen by us, which were Illinois test, 5-0-5 run test, pro shuttle test, four corners test, four corners jump test and T-test, statistically significant differences existed between the mean results of athletes and nonathletes. Consequently, this complex of tests is suitable for the assessment of agility in this age group. Ahmed Fadhil Farhan conducted the Illinois test for the age of 12–15 years in Malaysia. The subjects were the girls of a local school who had been randomly designated to the experimental or control group. The mean results of the first test were 14.92 seconds in the experimental group and 15.51 seconds in the control group [3]. The results of our 11–13-year-old girls were as follows: the mean of girls practising sports was 18.84 seconds, of those who did not – 20.70 seconds. This shows that our subjects' results were weaker. The explanation can be that the girls studied by us were somewhat younger.

A 5-0-5 run test had been conducted on female handball players aged 13±0.5 years, and the result was 3.02±0.17 seconds [7]. The results of our 11–13-year-old girls were: the mean of girls practising sports was 3.16 seconds, of those who did not – 4.10 seconds, the best result 2.15 seconds. Thus, our subjects' results were quite similar.

Our results also coincide with the studies of H. Kim, V. Dovbys et al who state that agility develops through practice and self-development, and that, in people who practise sports, agility is better developed than in those who do not [5, 2]. Our results showed that athletes surpassed nonathletes in agility tests. In the comparison of test results, we found the greatest differences between athletes and nonathletes in the four squares jump test and T-test. In the jump test, it was necessary to relocate the body in space by jumping as quickly as possible, simultaneously changing the direction of jumps, and in the T-test, it was necessary to slow down and accelerate quickly, keeping the body stable when moving forwards, to both sides and backwards. Thus, we can say that these tests are the most informative if tests for the assessment of agility are needed. Based on our results, we can recommend to young people and their coaches that, although agility is believed to be an inborn ability, it should be developed by means of sports, motion and workouts. The results show that the girls who practise sports are more agile than those who do not. In the results of all the six agility tests, there were statistically significant differences between the mean results of athletes and nonathletes.

The mean results of girls who practised sports were statistically significantly better than those of the girls who did not practise sports. The greatest differences in comparison of the mean results of nonathletes and athletes were

revealed in the T-test and four corners jump test. Therefore, we recommend using them for assessment of agility in different physical ability test complexes, as they were the most informative among the tests studied.

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