SEVEN publicações acadêmicas
EM PARCERIA COM: IEMS UNIASSELVI

Correlation between three speed tests in children's Futsal athletes

Victoria Nunes de Godoi[1], Mariani Atanazio Zirondi[2], Kailane Rodrigues Garcia Poleto[3], Marina Menegazzo Andreolli[4], Isabela Bozelli[5], Denis Carlos dos Santos[6], João Paulo Freitas[7], Jéssica Kirsch Micheletti[8].

ABSTRACT

Futsal is a team sport that demands high speed and agility, essential skills for the performance of players. To assess these skills, several tests are used, which can complicate the choice and comparison between them. The Projeto Esporte Brasil (PROESP-br) has updated its battery of tests to measure speed and agility, including the 20-meter displacement test, the agility T-test and the square test. A cross-sectional study evaluated 56 child futsal players using these tests to verify the need to apply multiple assessment methods for a more accurate analysis of physical abilities.

Keywords: Physical assessment, Child athletes, Speed.

INTRODUCTION

Futsal is an intermittent team sport characterized by frequent transitions in activity patterns, in which players must possess a high level of physical capabilities, technical and tactical skills (KROLO *et al*., 2020). Among the physical skills trained, speed and agility are mentioned, defined as the ability to perform a movement in a short period of time and quickly and accurately change the position of the whole body in the face of an external stimulus, respectively (HAGA, 2008; LUBANS *et al* , 2010). Several tests are proposed in the literature to assess such abilities, however, this wide variety makes it difficult to choose the test and thus limits comparisons in scientific research and the more assertive choice by health professionals, leading to the use of several tests to observe the same ability, often unnecessarily.

Understanding the sport, the principles of training and the trainable physical skills, as well as the profile of the athletes is necessary for the proper construction of an adequate training program, and within this scenario a good physical assessment helps to provide a solid basis in the selection of appropriate methods for directing training (PIERCE *et al.*, 2022).

In 2021, there was an update of a test battery of the Projeto Esporte Brasil (PROESP-br), a project of the School of Physical Education, Physiotherapy and Dance of the Federal University of Rio Grande do

[1] State University of Northern Paraná – Paraná
[2] State University of Northern Paraná – Paraná
[3] State University of Northern Paraná – Paraná
[4] State University of Northern Paraná – Paraná
[5] State University of Northern Paraná – Paraná
[6] State University of Northern Paraná – Paraná
[7] State University of Northern Paraná – Paraná
[8] State University of Northern Paraná – Paraná

Sul (UFRGS) which aims at a permanent observatory of indicators of growth and body development, motor and nutritional status of children and young people between 6 and 17 years old. For the speed and agility skill, the focus of this study, the project inserts the following tests: agility T-test (KROLO *et al*., 2020), 20-meter displacement test (GAYA *et al*., 2021) and the square test (GAYA *et al*., 2021), the latter two involving agility more clearly, since there is a change of direction during the test.

In the case of children, the physical evaluation becomes even more complex, since it requires sensitivity, patience and adaptation to ensure proper effectiveness. Thus, standardization in the choice of tests becomes even more necessary.

Thus, the objective of the study was to correlate the three different speed tests, included in the PROESP-br test battery, in children futsal players and to analyze their need for mutual applicability.

MATERIALS AND METHODS

This is a cross-sectional study carried out from the Permanent Program: Physical Activity and Health in Physical Therapy (Secapee 5766), of the Study and Research Group on Physical Activity and Health (GEPAFS) of the State University of Northern Paraná (UENP). A total of 56 male children who had been playing futsal for at least 1 month were evaluated.

The evaluation took place in just one day, on the court where the participants practice the sport, during the usual training time, which lasts 1 hour, with one group from 6:15 pm to 7:15 pm and the other, subsequent, until 8:15 pm.

Through the application of a form made in Google Forms, basic information was collected, such as: full name, age, time of training in futsal, if they practice other activities, as well as the name and telephone number of the person in charge, who also signed the term of authorization for the use of the image of the minors. Subsequently, vital signs (blood pressure, oxygen saturation, heart rate, and temperature) were checked and then familiarization was applied. Then the three speed and agility tests with 5 minutes of intervals between them, in the following order: 20m displacement test, agility T test and square test, these indicated for evaluation.

The displacement test (also known as 20-meter run) was demarcated three parallel lines on the ground, the first as the starting line also marked with a cone, the second as the timing line (with a distance of 20 meters) and the third line demarcates the arrival/finish of the test. The athlete must be behind the starting line and when giving the command must cross the third line in the shortest possible time (GAYA *et al*., 2021).

The agility T-test was performed on a court with four cones with 5 yards (4.57m) and 10 yards (9.14m) in positions A, B, C and D (with B being the middle cone). When giving the command, the athlete starts at cone A, running towards B, then runs laterally to cone C and straight to D, thus, they

return to B and return with their back to cone A. The stopwatch will only be stopped when the athlete passes the starting cone (CHANG *et al*., 2020).

In the square test, a 4x4-meter square was marked on the ground and a cone was placed at each of its ends. Then, the athlete immediately behind the starting line started the test with the evaluator's command going to the next cone diagonally. Then, he ran towards the right (or left) cone and then moved across the square diagonally. Finally, he runs to the last cone that corresponds to the starting cone, the athlete must touch all points on the course (GAYA *et al*., 2021).

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) (version 23; SPSS Inc, Chicago, IL). Mean values, standard deviation (SD), median, minimum and maximum were used to describe the study variables. To analyze the normality of the data, the Kolmogorov-Smirnov test was applied, resulting in a non-normal sample. Correlation between the three speed tests was performed using the Spearman Correlation test. The correlation values were interpreted as small or no relationship (0.00-0.25), weak relationship (0.25-0.50), moderate to good relationship (0.5-0.75) and good to excellent relationship (above 0.75) (PORTNEY; WATKINS, 2000).

RESULTS

Table 1 presents the characteristics of the sample, collected in an interview prior to the physical tests.

Table 1. Sample characterization

	Mean (SD)	Med (min; máx)
Age (years)	8,28 (2,83)	8 (4; 14)
Weight (Kg)	37,94 (16,49)	35,6 (13,7; 90,5)
Height (cm)	136 (19,53)	138 (99; 173)
Wingspan (cm)	131,85 (21,47)	132,5 (91; 184)
Systolic blood pressure (mmHg)	102,6 (13,52)	100 (80; 120)
Diastolic blood pressure (mmHg)	65,2 (12,16)	70 (40; 80)
SpO2 (%)	97,9 (2,11)	98 (85; 100)
Heart rate (bpm)	94,96 (15,15)	95 (65; 133)
Temperature (°C)	35,6 (0,77)	36 (34; 36,6)
Training time (months)	18,3 (15,23)	12 (1; 60)

Legend: DP: standard deviation; Mean: median; Min: minimum; Max: maximum; Kg: chylograms; Cm: centimeters; mmHg: millimeters of mercurium; %: percentage of oxygen; bpm: beats per minute; °C: degrees Celsius. n = 56.

Table 2 shows the correlation values of the 20m displacement velocity tests, agility T-test and square test (p-value≤0.001.). A statistically significant value was observed in all analyses, indicating a moderate to good relationship between the square test and the others, and a good to excellent relationship

between 20m displacement speed and the T-test.

Table 2. Correlation between speed tests

	Travel Speed	Agility T-test	Square test
Travel Speed	1	,800*	,576*
Agility T-test	,800*	1	,522*
Square test	,576*	,522*	1

Legenda: *p-valor ≤0,001.

The above findings agree with the results obtained in the study by Sonesson *et al*., (2021), which obtained moderate to strong correlations (r = 0.534–0.971) between seven different agility, jumping, and sprint skill performance tests, and thus it is believed that any of the three tests can be used in isolation, since they all measure, consistently and equally, speed in children who practice futsal. Thus, evaluation protocols for this skill do not need to be extensive and can be guided by simpler tests to be carried out with this child audience, since more complex tests, with changes of direction, for example, require greater understanding of children to be carried out properly.

Although the results are significant, it is worth noting that the sample was composed exclusively of boys who were futsal players, which may limit the generalization of the results. In addition, the age of the participants alternated between 4 and fourteen years, implying a variation in the way the tests were performed by each one, which may be a determining factor for the results obtained.

FINAL CONSIDERATIONS

The outcome of the study demonstrated that the choice of any of the three tests - Displacement Test, Agility T-Test and Square Test - can be made in isolation considering only the available resources and space, as well as the familiarity of the applicator and the understanding of the volunteers. The displacement test requires only one command and, since it has a good correlation when compared to two other tests, it is believed to be a more accessible choice for application in different populations. This corroborates the simplification of the process of evaluating children in terms of speed and agility, since more complex tests imply greater difficulty and risk in their application in a reliable way due to their understanding and comprehension.

REFERENCES

Chang, W. D., Chou, L. W., Chang, N. J., & Chen, S. (2020). Comparação da tela de movimento funcional, teste de equilíbrio Star Excursion e aptidão física em atletas juniores com diferentes riscos de lesão esportiva. BioMed Research International, 2020, 8690540. https://doi.org/10.1155/2020/8690540. Retrieved August 12, 2024.

Soneson, S., Lindblom, H., & Hägglund, M. (2021). O desempenho nos testes de velocidade, agilidade e salto tem correlações moderadas a fortes em jogadores de futebol juvenil, mas os testes de desempenho são fracamente correlacionados com testes de controle neuromuscular. Knee Surgery, Sports Traumatology, Arthroscopy: Official Journal of the ESSKA, 29(5), 1659–1669. https://doi.org/10.1007/s00167-020-06302-z. Retrieved August 12, 2024.

Gaya, A. R., Gaya, A., Pedretti, A., & Mello, J. (2021). Projeto Esporte Brasil: Manual de medidas, testes e avaliações (5th ed.). Universidade Federal do Rio Grande do Sul. https://www.ufrgs.br/proespbr. Retrieved August 12, 2024.

Haga, M. (2008). A relação entre aptidão física e competência motora em crianças. Child: Care, Health and Development, 34(3), 329–334. https://doi.org/10.1111/j.1365-2214.2008.00814.x. Retrieved August 12, 2024.

Krolo, A., et al. (2020). Testes de agilidade em jogadores de futebol juvenil: Avaliação da confiabilidade, validade e correlatos de protocolos de testes recém-desenvolvidos. International Journal of Environmental Research and Public Health, 17(1), 294. https://doi.org/10.3390/ijerph17010294. Retrieved August 12, 2024.

Pierce, K. C., Hornsby, W. G., & Pedra, M. H. (2022). Levantamento de peso para crianças e adolescentes: Uma revisão narrativa. Sports Health, 14(1), 45–56. https://doi.org/10.1177/19417381211056094. Retrieved August 12, 2024.

Lubans, D. R., et al. (2010). Habilidades fundamentais de movimento em crianças e adolescentes: Revisão dos benefícios associados à saúde. Sports Medicine (Auckland, N.Z.), 40(12), 1019–1035. https://doi.org/10.2165/11536850-000000000-00000. Retrieved August 12, 2024.