



A comparison of physical fitness by competitive levels in youth basketball players

Pedro Forte^{1,2,3}; Luís Ferreira^{1,2}; Pedro Flores^{1,2}, Carlos Soares^{1,2}, Carlos Moreira^{1,2}, António M. Monteiro^{3,4}

¹Higher Institute of Educational Sciences of the Douro, Penafiel, Portugal; ²Núcleo de Investigação em Desporto e Exercício Físico, Penafiel, Portugal; ³Research Center in Sports Sciences, Health Sciences & Human Development, CIDESD, Vila Real; ⁴Instituto Politécnico de Bragança, Bragança, Portugal.

Resumo / Abstract / Resumen

The aim of this study was to compare the physical fitness (PF) between under sixteen (U16) and under eighteen (U18) basketball players. Body mass and height were assessed with a bioimpedance balance and a stadiometer. Strength levels, The upper limbs strength was measured by the number of push-ups (per 30s) and lower limb's with a horizontal jump without preparatory race (in centimetres). Coordination was measured by dribbling 5 barriers in the diagonal with a distance of 1m (The first barrier at a distance of 8m from the start and the last at 1m of the basket). The speed was measured with a 20 meters sprint test (seconds). The seat and reach flexibility test and the up the back test in centimetres measured the flexibility. One way ANOVA assessed the statistical differences between groups. The significance level was 5%. Only significant different were founded between U16 and U18 players in weight. No significant differences were founded between groups in anthropometrics, strength, speed, coordination and flexibility. In this study, it is possible to conclude that there are no significant differences in physical fitness between U16 and U18 and basketballers should be encouraged to practice in a higher competitive level.

Palavras-chave / Key-words / Palabras-clave

Physical fitness, performance, youth, basketball.

Introdução / Introduction / Introducción

Some team sports include two competitive levels in one team. However, sometimes there are physical differences that may compromise the younger players' performance. In basketball, speed, strength and motor coordination are three elemental motor abilities and the individual technique, strength and resistance are also associated with the team performance (Forte et al., 2016). However, younger's performance may be affected by the physical fitness differences.

Métodos / Methods / Métodos

Sample:

This study was composed by nine U16 with 14.67 (\pm 0.50) years old and seven U-18 players with 16.71 (\pm 0.48) years old. All the players competed in Nacional Cup for U18 and U16 competitive levels. All the procedures were in accord to the Helsinki's declaration regarding human research. A written consent by the parents or tutors was obtained beforehand.

Procedures:

The upper limbs strength was measured by the number of push-ups (per 30s) and lower limb's with a horizontal jump without preparatory race (in centimetres). Coordination was measured by dribbling 5 barriers in the diagonal with a distance of 1m (The first barrier at a distance of 8m from the start and the last at 1m of the basket). The speed was measured with a 20 meters sprint test (seconds). The seat and reach flexibility test and the up the back test in centimetres measured the flexibility.

Statistical analysis:

The Levene's and Kolmogorov-Smirnov tests assessed the equality of variances and normality respectively. The One way ANOVA evaluated the statistical differences between groups. The significance level was 5%.

Resultados / Results / Resultados

Table 1 presents the comparisons between U14 and U16 basketball players.

Variables	Mean (\pm SD)		F	p
	U16	U18		
Age (years)	14.67 (\pm 0.50)	16.71 (\pm 0.49)	67.411	<0.001*
Weight (kg)	71.44 (\pm 3.28)	78.43 (\pm 4.79)	12.007	0.004*
Height (cm)	175.11 (\pm 8.02)	179.43 (\pm 4.47)	1.619	0.224
Wingspan (cm)	174.00 (\pm 9.72)	177.29 (\pm 3.99)	0.699	0.417
Upper Limbs Strength (reps)	23.5556 (\pm 8.37)	22.71 (\pm 6.87)	0.046	0.833
Lower Limbs Strength (cm)	198.33 (\pm 24.70)	207.71 (\pm 11.54)	0.854	0.371
Coordination (sg)	7.29 (\pm 0.40)	8.0486 (\pm 0.65)	3.139	0.098
Speed (sg)	3.77 (\pm 0.39)	3.4386 (\pm 0.19)	3.058	0.102
Sit and reach (cm)	-1.44 (\pm 7.52)	-1.7 (\pm 8.83)	0.004	0.948
Up the back (cm)	10.4444 (\pm 7.02)	5.57 (\pm 3.789)	2.727	0.121

Discussion and Conclusions

No significant differences in PF were observed between the two teams. Forte et al. (2016), applied a strength program on a U18 team. The authors made the same evaluations in two distinctive moments, the beginning of the season and four months later. Only age, upper limbs strength, coordination and up the back flexibility presented significant differences. In our study, no strength program was applied. However, the evaluations were at the beginning of the season and trainee was not assessed.

Different studies presented differences in strength levels (Fort-Vanmeerhaeghe et al., 2016; Forte et al., 2016). The mainly causes for physical fitness differences are strength levels. The main limitations of this study were: (i) the differences between U16 and U18 players were assessed in one single moment, at the beginning of the season; (ii) only sixteen players made part of this research.

In this study that, no significant differences in physical fitness between U16 and U18 competitive levels were found. Strategies such as train and compete in a higher competitive level should be adopted.

References

- Fort-Vanmeerhaeghe, A., Montalvo, A., Latinjak, A., & Unnithan, V. (2016). Physical characteristics of elite adolescent female basketball players and their relationship to match performance. *Journal of human kinetics*, 53(1), 167-178.
- Wattie N, Cobley S, Baker J. Towards a unified understanding of relative age effects. *Journal of Sports Sciences*. 2008;26(13):1403–9. pmid:18825541
- Figueira, B., Gonçalves, B., Masiulis, N., & Sampaio, J. (2018). Exploring how playing football with different age groups affects tactical behaviour and physical performance. *Biology of sport*, 35(2), 145.
- Forte, P, Bartolomeu, R. F, Monteiro, A. M., & Barbosa, T. M. (2016). Physical fitness in youth basketball players in pre and post season under a strength program effect. In *Proceedings of the International Congress of the Research Center in Sports Sciences, Health Sciences & Human Development* (pp. 104-105). Universidade de Évora.