

The effects of sport practiced on joint mobility, flexibility and muscle strength of young subjects

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It is known that joint mobility (JM), flexibility, muscle strength and posture can determine the quality of movement and could also adversely affect the body development of young subjects practicing sport. The aim of this study was to investigate how the practice of different sports affects these parameters.

We enrolled 109 young subjects practicing different sports: soccer (M/F:22/10), mean age 12,6±1,4 yrs, BMI:18,3±2,3 kg/m²; volleyball (M/F:13/14), mean age 12,0±1,3 yrs, BMI 17,4±2,2 kg/m²; basketball (M/F:20/2), mean age 11,1±0,8 yrs, BMI 20,9±4,4 kg/m²; gymnastics (M/F:0/11), mean age 14,5±1,1 yrs, BMI 18,9±2,1 kg/m² and dance (M/F:0/17), mean age 11,7±3,1 yrs, BMI 18,3±2,8 kg/m². In these subjects we evaluated ankle JM (inclinometer), trunk flexibility (sit & reach test), muscle strength (standing long jump, vertical jump and Jamar hand grip), posture (images on the sagittal plane) and lifestyle (IPAQ-C, IPAQ-A). The individual sporting history was investigated by a specific questionnaire.

The tests performed showed a significantly higher ankle JM in young dancers (155,8±10,3°) compared to all other groups excluding volleyball players (p<0,001). In particular, the subjects practicing soccer showed a significant reduction of the ankle JM (125,2±22,3°) compared to all the other groups of subjects investigated (p<0,01).

Gymnasts showed a greater flexibility of the trunk than that measured in all other groups (18,3±3,5 cm; p<0,001), while basketball players showed lower trunk flexibility (-7.7 ± 7.0 cm). In the muscle-strength tests performed the dancers showed the following results (hand grip: 18.7 ± 6.6 kg, long-jump standing 119.8 ± 29.2 cm) that are significantly reduced compared to the gymnasts (hand grip: 26.0 ± 4, 2 kg; p <0.005, long jump standing 163.8 ± 12.7 cm: p <0.001) and to volleyball players (standing long jump 152.5 ± 27.9 cm: p <0.001).

The practice of specific sports can significantly modify the ankle JM and the flexibility of the trunk as well as affect muscle strength even in young subjects. It is not entirely clear whether these effects may induce negative consequences on health and development of the anatomical structures involved; therefore, further studies are needed to verify the conclusions and the possible usefulness of APA programmes in the prevention or recovery of such significant effects.

References

- [1] Francia P, et al. (2018) Type 1 diabetes, sport practiced, and ankle joint mobility in young patients: What is the relationship? *Pediatr Diabetes* 19: 801–808.
- [2] Bieć E, Kuczynski M. (2010) Postural control in 13-year-old soccer players. *Eur J Appl Physiol*.110:703-708.
- [3] Steinberg N, et al. (2011) Paratenonitis of the foot and ankle in young female dancers. *Foot Ankle Int*. 32:1115-1121.

Key words

Sport, Joint mobility, Muscle strength.