

## SUMMARY

**Author:** Damian Sikora

**Topic:** The effect of sensorimotor exercises on body balance and transversus abdominis muscle thickness in children and adolescents playing football.

**Introduction:** The growing demands placed on young footballers have meant that more and more additional exercise programs are being introduced, which, in addition to improving body balance, will help to increase the sport score. Besides, the introduced exercises for a period of ten weeks can contribute to an increase in the thickness of the transverse abdominal muscle.

**Aims:** The aim of this study was to assess the impact of sensorimotor exercises on body balance and agility in children and adolescents practicing football. In this study, it was also decided to assess the impact of sensorimotor exercises on the thickness of the transverse abdominal muscle.

**Material and methods:** Randomized controlled trials included a group of 110 people aged 10-17. The qualified people were divided into two equal experimental and control groups. The study involved children and adolescents who have been training football for at least two years and their training units do not take place at least twice a week. In order to determine the body balance, agility and thickness of the transverse abdominal muscle, all tests were performed twice (before starting additional sensory exercises, as well as after completing the 10-week exercise program). The competitors were assessed for body balance using a stabilometric platform, and several functional tests were performed: Y-BT, BESS, foot retention test, agility test, and abdominal transverse muscle ultrasonography. People in the experimental group performed additional sensory-motor exercises twice a week for ten weeks, which took place before the actual football training.

**Results:** The obtained results confirm that in children and adolescents practicing football after a ten-week program of additional sensory-motor exercises, the dynamic balance improved in the Y test (KDL forward movement  $p = 0.05$ , KDL back movement  $p = 0.000001$ , KDP movement behind the back  $p = 0.0001$ , KDL and KDP backward movement average score  $p = 0.000001$ , total score  $p = 0.0001$ , reduction of back asymmetry at a slant ( $p = 0.001$ ). Additionally, participants attending sensorimotor exercises obtained an improvement in static balance assessed on the stabilometric platform (path length eyes open 30 seconds  $p = 0.000006$ , surface area eyes open 30 seconds  $p = 0.000001$ , path length eyes closed  $p = 0.007$ ). The ten-week program of additional sensorimotor exercises also contributed to the improvement of agility in children and adolescents playing football ( $p = 0.00003$ ).

**Conclusions:** The ten-week program of additional sensorimotor exercises introduced in the group of children and adolescents practicing football contributed to the improvement of selected balance parameters in the group attending the exercises. In addition, the introduced exercises for a ten weeks period have contributed to the improvement of agility in the group of children and adolescents practicing football. Additional sensory-motor exercises introduced for a ten weeks period did not increase the thickness of the transverse abdominal muscle.