Summary

Introduction: School-age children are especially liable to postural defects because they are in the period of development of the spine and the skeletal system. They are also more likely to being underweight or overweight because it's a period of shaping healthy habits. Puberty is a period of occurrence of a number of factors that hinder proper development. That's why it's so important to early diagnose disorders in order to implement therapeutic or educational activities.

The aim: The aim of the study was to assess the relationship between the factors of posture, body mass composition and balance parameters of children and adolescents. Additionally, the aim of the study was to analyse the influence of body mass composition on body posture parameters.

Material and methods: The study group consisted of 1137 children aged 7 to 15 years, of whom 559 were girls and 578 were boys. The ultrasound system ZEBRIS for posture examination, body composition analyser Tanita 780, the Zebris stabilometric platform, the questionnaire and the patient examination card were used for the study.

Results: As a result of the analysis of the correlation between body posture and balance, it was shown that along with the increasing distance of the left scapula from the reference plane, the ellipse area increased and the horizontal deviation. The greater the pelvic/shoulder obliquity, the smaller the vertical deviation.

Based on the assessment of the dependence of the body mass composition on balance, it was found that along with the increase in the fat percent, fat free mass and muscle mass, and the total body water content decreases the ellipse area, the distance covered by the projection of the center of pressure of the feet onto the platform and the horizontal deviation.

The study of the relationship between the BMI and the balance showed that the higher the BMI values, the smaller the ellipse area, the shorter the distance covered by the projection of the foot pressure center onto the platform, horizontal deviation, the lower the percentage load on the right lower limb and the greater the left one, and the lower the symmetry index value. It follows that children with higher BMI values had better balance parameters.

The analysis of the influence of body mass composition and BMI on body posture showed that children with a higher mass of lean tissue, muscle and total body water have higher values of the shoulder height difference on the right side and the greater distance of the blades from the reference plane.

Conclusions: 1. Torso asymmetry in the frontal plane has no influence on the balance parameters. 2. There are slight correlations between the asymmetry of the torso in the sagittal plane and the balance parameters. 3. Torso asymmetry in the transverse plane slightly correlates with the balance parameters. 4. Pelvic asymmetry does not affect balance parameters. 5. Body mass composition has a significant influence on the balance parameters. 6. The BMI correlates with the balance parameters. 7. There are correlations between the WHtR and the equilibrium parameters. 8. The composition of body weight and BMI significantly affect the parameters of body posture.

Key words: body posture, body weight composition, balance, children and adolescents.