

The usage of lean (simulation) technologies' tools to evaluate nutrition status and physical development in pediatrics

Valeria Novikova, Ilya Zhugel, Svetlana Chuinyshena, Olga Luzanova, Oleg Lisovskii, Aleksander Gostimskii, Ivan Lisitsa, Igor Karpatskii, Maksim Gavschuk, Natalia Getsko, Evgeniya Lisovskaya, Maria Prudnikova, Anna Zavyalova

Saint Petersburg State Pediatric Medical University, Ministry of Healthcare of the Russian Federation, Saint Petersburg, Russian Federation

Objective. To work out the skill of assessing physical development and nutritional status of children and adolescents in various ways, to carry out comparative analysis of methods.

Methods. Questionnaire data of patients examined in the office of a doctor — a nutritionist with various disorders of nutritive status — 101 people.

Anthropometry was performed, physical development was evaluated by the WHO Anthro program, using centile tables, and the impedance method (body composition). Statistical analysis, which included parametric statistics methods as well as r-Spearman rank correlation, was performed using Statistics 23.1 software.

Results. Physical development of children is a marker of adequacy of nutrition, and affects adaptation, severity of pathological processes, rate of recovery, effectiveness of therapy, terms of hospitalization. Not enough teaching time is devoted to the study and training of nutrition status assessment skills in various ways.

The skill of evaluation of physical development (FR) and nutritive status (NS) was worked out on the questionnaire data of specific patients. The results of the programme WHO

Anthro assessment, the centile tables and the impedance data were compared in 101 patients with eating disorders (54 boys), from 2 m.o to 17 y.o (average 8.5 y.o) Malnutrition 30%, severe malnutrition — 6% cases. Obesity revealed 39% kids. The results of the WHO Anthro assessment, the percentile tables and the impedance data were compared. Direct correlation links between the child 's percentile weight corridor, the WHO Anthro (z-score), and the percentage of deficiency or excess of fat and active cell mass are obtained ($p = 0.05$). The child 's percentile growth corridor and body mass index also correlate with the growth z-score, fat, and active cell mass percent according to body impedance ($p = 0.05$).

Conclusion. The skill of assessing physical development and nutritive status by students can be formed using simulation technologies. Physical development, as well as the nutritive status of the child, can be investigated by the WHO Anthro program using a computer application, or by using technologically complex equipment — impedance, or manually — with the help of centile tables. Deviations of nutritive status from physiological norm are determined by all proposed methods.