

ANALYSIS OF PHYSICAL DEVELOPMENT OF MOSCOW SCHOOLCHILDREN AGED 8–18 YEARS (ON THE RESULTS OF LONGITUDINAL STUDIES)

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The study of physical development in longitudinal researches is carried out with the aim to determine the dynamics of changes of anthropometric indicators, the level of biological maturation and functional indicators of children and adolescents in different time intervals. The processes of physical and sexual development are interconnected and reflect the general patterns of growth and development but at the same time they significantly depend on social, economic, sanitary, hygienic and other conditions, which influence is mostly defined by human age. During three longitudinal studies of physical development of Moscow schoolchildren (1960–1969, 1982–1991 and 2003–2013) the indicators of body mass and length, chest circumference, ratios, stages of biological development and muscular strength of the right hand were evaluated. The 10-year time scale of the observations allows determining the vector of changes of somatic development, puberty and functional capacities of children from decade to decade. The third longitudinal study of physical development of Moscow children and adolescents shows that modern schoolchildren exceed their peers of the 1960's and 1980's in main anthropologic indicators (body mass and length, chest girth) and the level of biological development (menarcheal age and the degree of development of the secondary sexual characters at an earlier age). The results of the studies show a change of body proportions in modern schoolchildren: the increase of body length is combined with the increase in leg length. During longitudinal observations of 2003–2013 a significant decrease of functional indicators (of hand strength) was found in children of all age groups. The findings dictate the necessity of new modern references for the assessment of physical development, reconsidering of normatives of biological development of schoolchildren and searching for the reasons of decrease in functional indicators.

Key words: *longitudinal studies, physical development, level of biological development, dynamometry*

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DEVELOPMENT OF SUBCUTANEOUS AND VISCERAL ADIPOSE TISSUE IN BULGARIAN ADOLESCENTS

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The purpose of this study is to investigate development of subcutaneous and visceral adipose tissue in Bulgarian children and adolescents by anthropometrical methods. The data analyzed are part of the three separate cross-sectional studies of 9–16-year-old children from Sofia, Plovdiv and Smolyan cities in Bulgaria, conducted in 1999–2009. The general sample included 3095 adolescents aged 9 to 16 years (1568 boys and 1527 girls). Height (cm), weight (kg) and waist circumference (cm) were taken on each person with standard methods (Martin-Saller, 1957). Additionally, the body mass index (BMI), subcutaneous (SAT, cm²) and visceral (VAT, cm²) adipose tissue, and VAT/SAT-ratio were calculated. The quantities of subcutaneous (SAT, cm²) and visceral (VAT, cm²) adipose tissue were defined by the regression equations of Brambilla et al. (2006). Different categories of body nutritional status were defined by cut-off points of BMI for children by Cole et al. (2007; 2012). Statistical data processing was performed using the software STA-

TISTICA 10.0. The descriptive analysis, ANOVA and alternative analysis (Z-score) were used. The results of analysis showed significant differences in accumulation of SAT and VAT between groups of children with different nutritional status. The children with normal nutritional status were characterized by non-significant below average values (Z-score) for SAT, VAT and VAT/SAT-ratio for their age and gender. In contrast, the groups of children with overweight and obesity were characterized by above average values for SAT and VAT ($p < 0.05$). The values VAT/SAT-ratio is below average for age and gender. With age the quantity of SAT and VAT in both sexes increase. Overall, the boys accumulate greater quantity of VAT in all period, and of SAT after 14 years. The differences between age, sex and territorial groups in quantity of SAT and VAT and their ratio were found.

Key words: *subcutaneous adipose tissue (SAT), visceral adipose tissue (VAT), VAT/SAT-ratio, body nutritional status, adolescents, Bulgaria*

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EVALUATION OF ARM ANTHROPOMETRY AND NUTRITION IN TURKISH PRESCHOOL CHILDREN

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Arm anthropometry – cross-sectional analyse of arm muscle area and arm fat area- has been used as a proxy of body composition in both clinical and field research and proposed to be an indicator of nutritional status. Present study aimed to evaluate nutritional status of preschool children aged 3-5 years old using arm anthropometry. The survey was conducted in Ankara, the capital city of Turkey, on 270 children (135 boys and 135 girls) from private and public preschools, whose parents gave consent to include their children in the study. Anthropometric measurements of mid-upper arm circumference (MUAC) and triceps skinfold were taken using standard technique and instruments, and arm muscle area (AMA) and arm fat area (AFA) were calculated. The results show that age differences in AMA between ages 3 and 4 were found to be statistically significant ($p < 0.05$). Furthermore, gradual increase in AMA in boys with age was prominent, and in AFA in girls, respectively. Thus, muscle development was clear in favour of boys and fat development - of girls. Anthropometrical studies, particularly, those of arm anthropometry on preschool children in Turkey are very limited, we think that the present study will provide a contribution to this area.

Key words: *nutrition, arm anthropometry, arm muscle area, arm fat area, preschool children, Turkey*

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