

PHYSICAL ACTIVITY, GROWTH AND DEVELOPMENT

## DETERMINANTS OF GROWTH IN CHILDHOOD AND ADOLESCENCE (122)

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Research into growth and development of children has generally a double use: (i) it provides health professionals with the necessary tools for accurate monitoring of growth of individual children, and (ii) the population growth curve is an indicator of affluence and living standards (e.g. Quetelet's "Physique Sociale", 1835; and J.M. Tanner's "Growth is a mirror of conditions in Society", 1986). At present day the study of growth on both the individual and population level can be refined through the study of its determinants. At the individual level this can lead to an improvement of the monitoring instruments (e.g. the use of midparent height, ethnic specific growth charts), at the population level they allow to detect sustained inequalities in health and living standards within the population. In this paper we will examine a number of these determinants of growth in the population of children and youngsters in Flanders.

In the Flemish Growth Survey (2001-2006), a cross sectional sample of 18000 subjects were measured and questioned on a single occasion, of whom 6000 subjects were re-measured once to obtain yearly increments in growth, and 900 subjects were measured monthly from birth to 12 months of age, and further every three months from 1 to 3 years of age. The primary aims of this study are the construction of new growth reference curves for Flemish children, and the study of determinants of growth. For each subject we obtained detailed information about a number of demographic, environmental, health and lifestyle indicators (origin, social status, parental height, gestation and birth outcome, diet, physical activity, smoking, alcohol use). Cross-sectional growth curves were fitted with the semi-parametric LMS method (Cole and Green, 1992). Normal equivalent deviates (z-scores) from the curve fitting process are compared across strata of different potential determinants.

Preliminary analysis showed persistence of differences in growth at present day, and in this presentation we will analyse and discuss a number of these differences in the length/height, weight, and BMI (Body Mass Index) for age curves.

*Key words: auxology, growth curve, determinants*

## **THE DEVELOPMENT OF AN EVIDENCE-BASED GUIDELINE FOR THE MONITORING OF GROWTH AND PUBERTY IN SCHOOL-AGED CHILDREN IN FLANDERS (178)**

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**INTRODUCTION:** Most countries in Europe have a preventive health care programme aimed at evaluating, protecting and promoting the health, growth and development of children and adolescents. School Health Care programmes are almost completely financed by public funding, which increasingly has led to questions about the cost-benefit and the degree of scientific evidence on which they are based. On the authority of the Ministry of Health, the Flemish Scientific Society for Youth Health Care has been engaged in the development of evidence-based guidelines for School Health Care. By September 2005 a guideline for the monitoring of "growth and puberty" in school-aged children (3-18 years) will be completed. After acceptance by the Flemish Health Administration and the Department of Education, this guideline will be the standard for good growth monitoring practice in School Health Care.

**METHODS:** This guideline has been developed following a methodology, taking into account the expertise of workers in School Health Care, general practice and specialised care.

The presentation will not only elaborate on the methodology used but also on the content of the guideline itself.

**RESULTS:** The guideline comprises two sections: (1) A theoretical part, based on national and international literature, summarising all relevant information about normal and abnormal growth and puberal development; (2) A practical guideline for the monitoring of growth and puberty in school health care, aiming at the early detection, diagnosis and treatment of pathology in this area.

This practical guideline focuses on six key questions relevant in School Health Care, i.e. (a) Is this child too small?; (b) Is this child too tall?; (c) Did puberty start too early?; (d) Did puberty start too late?; (e) Is this child growing too slow?; and (f) Is this child growing too fast?

The decision-making process for any of these questions is designed as user-friendly flowcharts from which a selection will be highlighted in the presentation. The underlying rationale will be explained.

**CONCLUSION:** As far as we know this is the first comprehensive evidence-based guideline for the monitoring of growth and puberty in children, in the framework of School Health Care.

*Key words: growth monitoring, puberty, school health care, guideline, school-aged child*

## THE INFLUENCE OF CORRECTIVE GYMNASTIC FOR PREVENTION OF DEFORMITIES OF MUSCULAR-SKELETON (61)

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**INTRODUCTION:** Biological development of children is followed up by numerous varieties of whole morphological structure. These varieties are result of activities of indoor and outdoor factors. Physical activity is powerful issue for harmonious development and consolidation of health of children and adolescents. The teacher has to know the problems connected with spinal column disorders and with special training removing bad corporal pose, growing strong and ton using of some group of muscles which keep up the correct corporal pose. For this, it is necessary a professional improving of the teacher and collaboration with school doctor who with regular and continuous realization of systematic examination reveal bad corporal pose and spinal column deformities.

**AIM:** Prevention of spinal column deformities with regular, planed and correctly training of corrective gymnastic.

**MATERIAL AND METHODS:** Were observed 9525 students (4418 female and 5106 male) at 7-25 year old in the period of 3 years. Used data are of systematic examination of students, and periodical check ups for students-sportiest. Corrective gymnastic is presented of systematic examination. It is recommended a regular, planned and corrective training of corrective gymnastic at first 15 minutes of the physical class like daily physical activity of 15 minutes at home.

**RESULTS:** The high percentage of 96,5% of bad corporal pose is resulted in the number of students with spinal column deformities, scoliosis at 6.4% and kyphosis at 8.2% of students. Inadequately and incorrectly representation of corrective gymnastic contributes for aggravation of position. With regular, planned and corrective training of corrective gymnastic of physical class spinal column deformities are decreased at less of 35%, scoliosis at 4.1% and kyphosis at 5.4%.

**CONCLUSION:** Regular, planed, corrective and daily training of corrective gymnastic under control of professional trainer have significant influence for prevention of spinal column deformities. It is recommended increasing number of physical lessons, regular training of corrective gymnastic and introduction of teachers of physical education for students in lower class in elementary schools.

*Key words: corrective gymnastic, spinal column deformities, prevention*

## **DEVELOPMENT OF CHILDREN FROM BIRTH TO 18 YEARS OF AGE (201)**

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**INTRODUCTION:** In this paper we publish the reference data calculated from data from the Hungarian Nation-wide Representative Longitudinal Growth Study, from the reference data used by doctors most frequently with regard to the measurements of the body from birth to the age of eighteen. These are the most generally used measurements of the body: height, body mass and BMI, as well as the circumference of the head and that of the chest in infancy (from birth to the age of two).

**SUBJECT AND METHOD:** The re-measurement of children examined in 1980, 1981, 1982, and 1983 at the time of the infancy on the national representative sample-area took place every 30 days until the age of 6 months, every 60 days until the age of 1, then every 3 months until the age of 2. Afterwards children were re-measured and re-examined at each of their birthday until the age of 10, and every 6 months between the age of 10 and 18.

**RESULTS AND CONCLUSION:** The reference percentiles calculated for the period between birth and the age of 2 and from the age of 2 and 18. It can be perceived in the medical practice that a child's height and body mass are usually in parallel with the reference percentiles of the given size. If substantial and permanent divergence can be detected regarding the reference percentiles trend lines then the potential problems and consequences in the growth of the child can be found out in time.

In most countries in the world body mass index is used for the assessment of adults' nourishment in accordance with the recommendation of the WHO. In developed countries the rate of the obese is growing every year. The health risk of people is growing in parallel with obesity, which means a larger burden not only for individuals but also for the country.

We have worked out the reference percentiles of BMI based on the Hungarian Longitudinal Growth Study for practising pediatricians and nurses. Reference percentiles of the BMI serving for the approximate assessment of a child's nourishment have been depicted from birth to the age of 18.

It is important to pay attention to head and chest circumferences during infancy and the first life-year of children.

The diversion of head circumference, more precisely, any significant diversion of the trend line of the measured data from the trend line of the reference data of the given age, or the trend line of the percentiles either in a negative or a positive direction merits a thorough examination.

*Key words: longitudinal growth study*

## ANTHROPOMETRIC VALUES OF CHILDREN FROM ŠIBENIK AND KNIN (207)

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This research shows the results of anthropometric values of children from Šibenik and Knin after a medical examination meant for their enrolment at primary school for school-year 2004. The goal of this research is to establish if there is a statistically considerable difference of anthropometric values between children in Šibenik and Knin upon their enrolment at primary school. 601 children were included: out of which 301 from Šibenik and 300 from Knin. All children were aged 6,55. Since the girls and the boys were not considerably different in statistics according to height, weight or how much they were well-fed, we analysed them together.

For the results evaluation we have used the curves of centile distribution for height, weight and the proportion of weight according to the height for school children and the youth of Croatia (Prebeg Ž., 1988.). The children from Šibenik are statistically considerably taller. In the group from 75 to 97 centil there are 1,5 times as many as in Knin.

The children from Šibenik are even statistically considerably weighing more. In the group from 75 to 97 centil there are 1,3 times as many as in Knin. The children from Knin weigh less. In the group from 10 to 25 centil there are

1,4 time as many as in Šibenik. The state of how well-fed the children were (proportion of weight and height) between the children from Šibenik and Knin didn't show any statistically considerable difference.

*Key words: antropometric values, weight, height*

## **INFLUENCE OF THE EXTRASCOLAR SPORT ACTIVITIES ON THE BMI OF THE ELEMENTARY SCHOOL PUPILS – GRADE 8 (139)**

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Sport activity is an important factor in the body mass regulation. We assumed that the children who practice an extrascolar sport activity, have normal body mass index.

Measurements were done during systematic examination of the 8th grade pupils of elementary school. Pupils who came to the examination were submitted to measurements of body weight and height, and an inquiry was done to find out if they practised an extrascolar sport activity.

Total number of examined pupils is  $N=227$ , that is 111 girls, and 106 boys. Out of a total of 111 girls, 48 (43.2%) of them practice extrascolar sport activities, whereas 37 (34.9%) boys out of a total of 106 practice extrascolar sport activities.

The results of the study show that the children who practice an extrascolar activity have normal body mass index (BMI 18.5 kg/m<sup>2</sup> – 25 kg/m<sup>2</sup>).

Therefore we think that it is important to include and systematically motivate pupils to practice extrascolar sport activities.

*Key words: extrascolar sport activities, BMI*

# **CORRELATION BETWEEN CHILDREN'S WEIGHT AND HEIGHT AT SYSTEMATIC MEDICAL EXAMINATION BY ENROLLING IN 1st CLASS OF PRIMARY SCHOOL AND BIRTH GROWTH PARAMETERS WITH PARENTAL HEIGHTS (9)**

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**INTRODUCTION:** Physical growth is permanently influenced by genetic and environmental factors. Their impacts are overlapping, and therefore it is difficult to separate the contribution particularly ascribable to one or another kind of the factors.

**SUBJECTS AND METHODS:** The study investigated the relation between body weight and height in 397 children (195 girls and 202 boys) enrolling primary school and their birth growth features on the one side and their parents' heights on the other. The correlations between children's weight and height by enrolling primary school and their birth growth features were also studied. The aim was to examine proportion of genetic determinacy of children's growth.

**RESULTS:** Mean birth weight and length were  $3440 \pm 413$  g and  $50.50 \pm 2.00$  cm, respectively, and mean head circumference was  $34.50 \pm 1.20$  cm. By entering the primary school, the children were  $6.70 \pm 0.30$  years of age in average, and had mean body weight and height of  $24.60 \pm 5.00$  kg and  $122.70 \pm 6.15$  cm, respectively.

Children's height by enrolling the school was in significant positive correlation with birth weight, length and head circumference, and with parents' heights. The correlation coefficient was the highest with father's height ( $r=0.473$ ,  $p<0.01$ ), and the lowest with birth weight ( $r=0.158$ ,  $p<0.05$ ). Children's weight by enrolling the school significantly positively correlated with the three birth growth features and with father's height, but not with mother's height ( $r=0.091$ ,  $p>0.05$ ). The correlation coefficient was the highest for father's height ( $r=0.288$ ,  $p<0.01$ ) again. All the birth parameters correlated stronger with mother's than with father's height.

In the subgroup of children whose mothers were of equal or greater height than fathers ( $n=28$ ), correlation coefficient between children's and fathers' heights ( $r=0.295$ ,  $p<0.01$ ) were lower than between children's and mothers' heights ( $r=0.474$ ,  $p<0.01$ ).

In conclusion, children's weight and height at the time of enrolling primary school significantly positively correlates with their parents' heights. The correlations are stronger with father's height. Though, it is not the matter of gender, but of the higher parent. The birth growth parameters are only in part related to parents' heights (all the three with mother's and only one with father's height). It is obvious that mothers' influence is dominant for children's growth at that time.

*Key words: children's weight, children's height, birth weight, birth length, head circumference, parents' heights*

## PROMOTING PHYSICAL ACTIVITY FOR HEALTH PROTECTION (230)

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**INTRODUCTION:** Results of previous studies point to the beneficial effects of physical activity in adults. Adequate physical activity significantly reduces the risk of obesity, hyperlipidemia, cardiovascular diseases, osteoporosis, non-insulin dependent diabetes mellitus (type 2), and contributes to good control of insulin dependent diabetes mellitus (type 1). Two thirds of children worldwide are estimated to practice inadequate physical activity. Screening studies conducted in Croatian schools have also revealed low level of physical activity in schoolchildren, with further physical activity decline with time. Children spend ever more time sitting at PCs and watching TV.

**AIM:** Evaluation of the action entitled Promoting Physical Activity for Health Protection, and stimulating schoolchildren for physical activity at leisure. Assessment of the schoolchildren's satisfaction with physical and health culture (PHC) classes, to identify the respective needs and shortcomings. Identification of problems related to physical activity of schoolchildren at leisure.

**SUBJECTS AND METHODS:** The program of prevention included 406 schoolchildren, 188 boys and 218 girls, of the total of 453 six-graders from five elementary schools in Zagreb. The children attended lectures and participated in a workshop entitled Me and My Body, followed by a questionnaire.

**RESULTS:** As many as 85.8% of study children consider PHC classes necessary; 82.1% think that PHC classes should also include theoretical information on health issues; 61.3% believe that handicapped children are paid inadequate attention; 71.2% think that individual exercise programs should be available at school; 48.1% believe that sports activities do not interfere with learning; 81.0% agree that organised sports clubs should exist at schools; 89.6% think that exercise is important for health rather than physical appearance.

**CONCLUSION:** PHC classes should help the schoolchildren acquire a healthy habit of regular physical activity in order to protect health and to improve their physical appearance and their self-image. One of the tasks of school medicine, in collaboration with schools, is to promote exercise, to develop positive attitude towards physical activity, regular exercise and movement. An active child is likely to grow into an active adult. The children's opinion should also be taken in consideration, i.e. offer them health topics in the frame of PHC classes and establishment of sports clubs at schools.

*Key words: prevention, physical activity*