

Nº de abstracts = **76**

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Randomized, controlled trial promotes physical activity and reduces consumption of sweets and sodium among overweight and obese adults.

Assunção, MC, Gigante DP, Cardoso MA, Sartorelli DS, Santos IS.: Nutrition research (New York, N.Y.)

201008 30(8):541-9. Department of Nutrition, School of Nutrition, Federal University of Pelotas. Rua Marechal Deodoro 1160. Pelotas, RS 96020220, Brazil.

The present study sought to assess the impact of an intervention to reduce weight and control risk factors of noncommunicable chronic diseases in overweight or obese adults who are users of primary and secondary healthcare units of the public health system of Pelotas, Brazil. We hypothesized that individuals who received an educational intervention regarding how to lose weight and prevent other noncommunicable chronic disease risk factors through nutrition would lose weight and acquire active habits during leisure time more frequently than individuals under regular care. Two hundred forty-one participants from the Nutrition Outpatient Clinic of the Medical Teaching Hospital of the Federal University of Pelotas, Brazil, aged 20 years or older and classified as overweight or obese were randomly allocated to either the intervention group (IG; n = 120) or control group (CG; n = 121). The IG received individualized nutritional care for 6 months, and the CG received individualized usual care of the health services. Intention-to-treat

analyses showed that at 6 months, mean fasting glycemia and daily consumption of sweet foods and sodium were reduced, and the time spent on physical leisure activity was increased in IG. Analysis of adherence to the protocol of the study revealed that individuals from IG had lost more in body weight, waist circumference, and fasting glucose compared to the CG. Leisure time physical activity increased in IG. Individuals adhered equally to the dietetic recommendations, irrespective of the nutrition approach that was used.

Risks associated with exercise testing and sports participation in cystic fibrosis.

Ruf K, Winkler B, Hebestreit A, Gruber W, Hebestreit .: Journal of cystic fibrosis : official journal of the European Cystic Fibrosis Society
2010
9(5):339-45.
Children's Hospital of the University, University of Würzburg, Germany.

BACKGROUND: Severe adverse reactions (SARs) associated with physical exercise have not been systematically studied in cystic fibrosis (CF). **METHODS:** Two surveys were conducted to assess the incidence of exercise-related SARs: a caregiver survey asking for complications associated with exercise testing and in-hospital training therapy and a web-based patient survey

asking for problems with exercise. RESULTS: 78 of 107 CF facilities caring for 4208 patients responded to the caregiver survey, 256 patients answered the web-based survey. No SARs were reported for 713 exercise tests. With in-hospital training, the yearly incidence of exercise-related SARs such as pneumothorax, cardiac arrhythmia, injury or hypoglycaemia was or=85th percentile) was 42.0 and 47.4% in spring 2007 for the BP and BPC students, respectively. From spring 2007 to spring 2008, the percent of students classified as overweight/obese decreased by 1.3 percentage points ($P = 0.33$) in BP schools, compared to a decrease of 8.3 percentage points (P

Reference values for the 6-min walk test in healthy children aged 6-12 years.

Priesnitz CV, Rodrigues GH, Stumpf Cda S, Viapiana G, Cabral CP, Stein RT, Marostica PJ, Donadio MV.: *Pediatric Pulmonology*, 2009, 44(12):1174-9. Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS), Porto Alegre, Rio Grande do Sul, Brazil.

Objective: To establish reference values for the 6-min walk test in healthy children and adolescents aged 6-12 years. **Methods:** This cross-sectional, prospective study selected healthy children and adolescents aged 6-12 years, at three elementary schools in Porto Alegre. The anthropometric data of all the individuals were evaluated and two 6-min walk tests were performed. Based on this, a reference equation was generated, and the test reproducibility was evaluated. **Results:** One hundred eighty-eight children (92 boys) performed the test. Pearson correlation showed that age ($r = 0.51$), height ($r = 0.49$), difference in heart rate before and after the test (dif. HR) ($r = 0.30$), and weight ($r = 0.29$) were significantly correlated with the distance covered in 6 min. The best multiple regression model included these four variables resulting in the following equation: $145.343 + [11.78 \times \text{age (years)}] + [292.22 \times \text{height (m)}] + [0.611 \times \text{dif. HR (bpm)}] - [2.684 \times \text{body weight (kg)}]$. The intraclass correlation coefficient confirmed the reproducibility among tests. **Conclusion**

: The reference equation for the 6-min walk test was generated and the distance covered is influenced by age, height, difference in heart rate before and after the test, and body weight.

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Physical fitness in relation to transport to school in adolescents: the Danish youth and sports study.

Andersen LB, Lawlor DA, Cooper AR, Froberg K, Anderssen SA. *Scandinavian Journal of Medicine & Science in Sports*, 19(3):406-11, 2009.

Department of Sports Medicine, Norwegian School of Sport Sciences, Oslo, Norway.

In many Western countries, there are concerns about declining levels of physical activity in school-aged children. Active transport is one way to increase physical activity in children, but few studies have evaluated whether active transport in school-aged children and adolescents has beneficial effects on fitness and, if so, whether different modes of transport affect different aspects of fitness. In this study, we examined the association of active transport with different aspects of fitness in a representative Danish sample of 545 boys and 704 girls, 15-19 years of age. Physical fitness was assessed through a number of field tests, including a maximal cycle test, dynamic and static strength in different muscle groups, muscle endurance, flexibility and agility. Transport to school was reported as the mode of transport. Almost two-thirds of the population cycled to school. Cyclists had higher aerobic power than both walkers and passive travelers (4.6-5.9%). Isometric muscle endurance (10-16%), dynamic muscle endurance in the abdominal muscles (10%) and flexibility (6%) were also higher in cyclists compared with walkers and passive travelers. Mode of travel was not related to leisure-time sports participation. Our findings suggest that commuter bicycling may be a way to improve health in adolescents.

Maternal insulin sensitivity during pregnancy predicts infant weight gain and adiposity at 1 year of age.

Hamilton JK, Odrobina E, Yin J, Hanley AJ, Zinman B, Retnakaran R. Obesity (Silver Spring, Md.), 18(2):340-6, 2009.

Hospital for Sick Children, Department of Pediatrics, Toronto, Ontario, Canada.

Emerging evidence suggests that fetal environmental exposures impact on future development of obesity. The objectives of this study were to assess the relationships between (i) maternal insulin sensitivity and glucose tolerance status in pregnancy and (ii) early infant weight gain and adiposity in the first year of life. In this prospective cohort study, 301 women underwent oral glucose tolerance testing for assessment of glucose tolerance status and insulin sensitivity (IS(OGTT)) in pregnancy. Their infants underwent anthropometric assessment at 12 months of age, including determination of weight gain in the first year of life and sum of skinfold thickness (SFT), a measure of infant adiposity. Infant weight gain and sum of SFT at 12 months did not differ according to maternal glucose tolerance status. On univariate analyses, weight gain from 0 to 12 months and sum of SFT were negatively associated with maternal IS(OGTT) during pregnancy. On multiple linear regression analysis, negative independent predictors of weight gain from 0 to 12 months were maternal IS(OGTT) during pregnancy ($t = -2.73$; $P = 0.007$), infant female gender ($t = -3.16$; $P = 0.002$), and parental education ($t = -1.98$; $P = 0.05$), whereas white ethnicity was a positive independent predictor ($t = 2.68$; $P = 0.008$). Maternal IS(OGTT) ($t = -2.7$; $P = 0.008$) and parental education ($t = -2.58$; $P = 0.01$) were independent negative predictors of sum of SFT at 12 months. Independent of maternal glucose tolerance status, maternal insulin resistance during pregnancy is associated with increased infant weight gain and adiposity over the first year of life. Further longitudinal study to evaluate obesity in this group of children will increase our understanding of the contribution of the intrauterine environment to their long-term health.

Intraperitoneal fat and insulin resistance in obese adolescents.

Obesity (Silver Spring, Md.), 18(2):402-9, 2009.

Obesity is epidemic among adolescents in the United States. We sought to analyze the anthropometric measures of adiposity and fasting indices of insulin resistance, including insulin-like growth factor-binding protein-1 (IGFBP-1), and to provide a clinical estimate of intraperitoneal (IP) fat in obese adolescents (BMI \geq 95th percentile), between ages 13 and 17 years. Subjects had baseline testing to determine eligibility for a subsequent randomized, placebo-controlled trial of metformin XR therapy. Anthropometry and dual-energy X-ray absorptiometry (DXA) were used to quantify total body fat while abdominal computed tomography (CT) was used to measure IP (CT-IP) and subcutaneous (CT-SQ) fat. Using anthropometry and fasting laboratory data, we constructed regression models for both CT-IP and CT-SQ. A total of 92 subjects, 33 males, were evaluated. Of the 92 subjects, 19 were black. Fasting insulin concentrations were highly associated with other measures of insulin resistance. Median percent body fat across all subjects, as measured by DXA, was 41%. Using CT measures, 67% of abdominal cross-sectional area was fat, 14% of which was IP fat. In multiple regression analysis, waist circumference (WC) and BMI, jointly and independently, were strongly associated with both CT-IP and CT-SQ fat. BMI and WC explained 62% of variance of CT-SQ fat, but only 26% of variance of CT-IP fat. Adding triglyceride:high-density lipoprotein (TG:HDL) ratio and IGFBP-1 (among nonblacks) to the regression model increased the explained variance for estimating CT-IP fat to 45%. When evaluating the metabolic morbidity of an obese adolescent, a model using fasting IGFBP-1, TG:HDL, BMI, and WC may be worthwhile as an estimate of IP fat.

Motocross morbidity: economic cost and injury distribution in children.

Larson AN, Stans AA, Shaughnessy WJ, Dekutoski MB, Quinn MJ, McIntosh AL. Journal of pediatric orthopedics

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29(8):847-50, 2009.

Mayo Clinic, Rochester, MN 55905, USA.

Background: Motocross is a nationally organized sport that is growing in popularity. The

distribution and severity of motocross injuries in the pediatric population is not known. We hypothesize a high rate of musculoskeletal injuries requiring hospitalization and/or surgical intervention.

Methods: All patients 17 years of age or younger with injuries sustained while using off-road 2-wheeled motorcycles were identified through surgical, diagnostic, and trauma registries at a level 1 regional trauma center. Type, severity, and mechanism of injury were assessed, as well as charges billed for medical care. Both recreational and competitive motocross activities were included.

Results

: From 2000 to 2007, 299 cases were noted in 249 unique patients. In 141 instances, hospital admission was required, for a total of 412 inpatient days. Twenty patients required ICU admission. Surgery was performed in 91 cases (81 orthopaedic, 6 general, 1 urology, and 4 facial reconstructions). Orthopaedic surgical procedures included treatment of 29 femur fractures, 8 forearm, 6 ankle, 5 tibial shaft, 6 proximal tibia, 5 spine, 6 proximal humerus, 4 hand, 4 foot, 3 elbow fractures, and 5 other. Orthopaedic interventions also included 8 reductions under general anesthesia and 31 conscious sedations. Mean age at injury was 14.1 years (range: 5.4 to 17.9). Ninety-four percent of patients were male and 85% were White. The majority of patients were wearing helmets/safety equipment. One hundred and eighty-four injuries occurred on a track, with 150 during competition. The mean charge billed per injury was \$14,947 (range: \$105 to \$217,780), with a total cost of \$4.5 million.

Conclusions

: Nearly half of motocross patients treated at a regional level 1 trauma center required hospitalization, and nearly one-third required surgery. The vast majority of surgical procedures (89%) were orthopaedic. Despite a high usage rate of helmets and protective gear, severe injuries were still sustained, including femur fracture (29), hemiparesis/spinal cord injury (2), and head injury (43). The majority of injuries occurred during organized race or practice. Families should be counseled with regard to the use of safety equipment and the severity of injuries sustained during competitive motocross activity.

LEVEL OF EVIDENCE: Level IV, case series.

Skeletal geometry and indices of bone strength in artistic gymnasts.

Dowthwaite JN, Scerpella TA. Journal of Musculoskeletal & Neuronal Interactions , 9(4):198-214, 2009. De
partment of Orthopedic Surgery, SUNY Upstate Medical University, Syracuse, NY 13210, USA.

This review addresses bone geometry and indices of skeletal strength associated with exposure to gymnastic loading during growth. A brief background characterizes artistic gymnastics as a mechanical loading model and outlines densitometric techniques, skeletal outcomes and challenges in assessment of skeletal adaptation. The literature on bone geometric adaptation to gymnastic loading is sparse and consists of results for disparate skeletal sites, maturity phases, gender compositions and assessment methods, complicating synthesis of an overriding view. Furthermore, most studies assess only females, with little information on males and adults. Nonetheless, gymnastic loading during growth appears to yield significant enlargement of total and cortical bone geometry (+10 to 30%) and elevation of trabecular density (+20%) in the forearm, yielding elevated indices of skeletal strength (+20 to +50%). Other sites exhibit more moderate geometric and densitometric adaptations (5 to 15%). Mode of adaptation appears to be site-specific; some sites demonstrate marked periosteal and endosteal expansion, whereas other sites exhibit negligible or moderate periosteal expansion coupled with endocortical contraction. Further research is necessary to address sex-, maturity- and bone tissue-specific adaptation, as well as maintenance of benefits beyond loading cessation.

Redox, iron, and nutritional status of children during swimming training.

Kabasakalis A, Kalitsis K, Nikolaidis MG, Tsalis G, Kouretas D, Loupos D, Mougios V. *Journal of Science and Medicine in Sport / Sports Medicine Australia*12(6):691-6, 2009.

Department of Physical Education and Sport Science, University of Thessaloniki, Greece.

Effects of exercise training on important determinants of children's long-term health, such as redox and iron status, have not been adequately investigated. The aim of the present study was to examine changes in markers of the redox, iron and nutritional status of boy and girl swimmers during a prolonged period of training. 11 boys and 13 girls, aged 10-11 years, were members of a swimming club. They were assessed at the beginning of the training season, at 13 weeks and at 23 weeks through blood sampling and recording of the diet. Reduced glutathione increased at 13 and 23 weeks, whereas oxidised glutathione decreased at 13 weeks, resulting in an increase of the reduced/oxidised glutathione ratio at 13 and 23 weeks. Total antioxidant capacity, catalase, thiobarbituric acid-reactive substances, hemoglobin,

transferrin saturation and ferritin did not change significantly. Carbohydrate intake was below 50% of energy and fat intake was above 40% of energy. Intakes of saturated fatty acids and cholesterol were excessive. Iron intake was adequate but intakes of folate, vitamin E, calcium and magnesium did not meet the recommended daily allowances. No significant differences were found between sexes in any of the parameters measured. In conclusion, child swimmers improved the redox status of glutathione during training, although the intake of antioxidant nutrients did not change. The iron status was not impaired by training. Suboptimal intake of several nutrients suggests the need for nutritional monitoring and education of children athletes.

The energy cost of cycling and aerobic performance of obese adolescent girls.

Lafortuna CL, Agosti F, Busti C, Galli R, Sartorio A.: Journal of Endocrinological Investigation, 3 2(8):647-52, 2009.

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In order to assess the energy cost of cycling and aerobic capacity in juvenile obesity, responses to cycle ergometer exercise were studied in 10 pubertal obese (OB) [body mass index (BMI) SD score (SDS): 3.40 \pm 0.58 SD] adolescent girls (age: 16.0 \pm 1.2 yr) and in 10 normal-weight (NW, BMI SDS: -0.30 \pm 0.54) girls of the same age (15.1 \pm 1.9). To this aim, gas exchange, heart rate (HR), and energy expenditure (EE) were studied during graded cycle ergometer test at 40, 60, 80, 100, and 120 W. The energy cost of cycling was higher in OB, being oxygen uptake (VO₂) higher (about 20%) in OB than in NW girls at all workloads (p