Poster Exhibition

11. Obesity and Metabolic Syndrome in Children and Adolescents

PE 11-01 11. Obesity and Metabolic Syndrome in Children and Adolescents

Performance of Mid-Upper Arm and Wrist Circumferences for Identifying General and Fat Obesity in Children Aged 7-15 Years

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Background: Mid-upper arm circumference (MUAC) and wrist circumference are frequently used as screening tools for obesity in children. Nonetheles, specific cut-offs were required for a certain population. This study aimed to investigate the performa of MUAC and wrist circumference in identifying general and fat obesity in children aged 7-15 years.

Methods: Participants were 1103 children aged 7-15 years (538 boys, 565 girls) from Yogyakarta, Indonesia. Height, weight, and skinfold thickness were measured. Percentage of body fat (%BF) was estimated from skinfold thickness (fat obesity). Body mass index (BMI) was calculated (general obesity). The data were stratified by age (7-9, 10-12, 13-15 years) and gender. Statistical analyses used were one-way ANOVA, Pearson correlation, independent sample t-test, the Receiver Operating Characteristic (ROC) and Area Under the Curve (AUC). The sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were evaluated.

Results: The prevalences of general obesity were 20.6% (boys) and 19.6% (girls), while fat obesity were 24.0% (boys) and 16.8% (girls). MUAC and wrist circumference were significantly correlated with BMI and %BF in both boys and girls aged 7-9 and 10-12 years (r=0.36-94; p<0.01). In boys and girls aged 13-15 years, MUAC and wrist circumference were only significantly correlated with %BF (r=0.19-0.68; p<0.01). Overall, MUAC had a higher AUC than wrist circumference across all age groups and and genders for both general (AUC=0.767-0.985) and fat obesity (AUC=0.709-0.990). The younger age groups appear to have higher AUC. Cut-offs were established for both general and fat obesity, stratified by gender and age. MUAC and wrist circumference performed better in detecting fat obesity than general obesity, and in younger than older age groups.

Conclusion: MUAC and wrist circumference were useful in identifying general and fat obesity in children aged 7-15 years. Cut-offs should be used with caution and consideration for age and gender.

Keywords: MUAC, wrist circumference, BMI, %BF, obesity

PE 11-02 11. Obesity and Metabolic Syndrome in Children and Adolescents

Feeding to Soothe, Appetitive Traits and Weight Status of Malaysian Infants in the First 6 Months of Life

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Background: Weight status in early infancy has been found to predict obesity in later life. Appetitive traits emerge early in postnatal life and some of these traits may predispose a child to over-eating. Poor feeding practices may also lead to excessive weight gain in infancy.

Methods: This cross-sectional study aimed to determine the associations between feeding to soothe, appetitive traits and weight status of infants aged 1 – 6 months in Kuala Lumpur and Putrajaya, Malaysia (n=229). Feeding to soothe was assessed using Baby's Basic Needs Questionnaire, and infant's appetitive traits (food responsiveness, enjoyment of food, satiety responsiveness, slowness in eating, general appetite) were assessed using Baby Eating Behaviour Questionnaire. Infant's gestational age, birth weight, current weight and length were obtained from their health records. Weight-for-length z-score (WLZ) and length-for-age z-score (LAZ) were determined using WHO Anthro software.

Results: The prevalence of overweight/obesity (WLZ ≥ +1SD) among the infants was 9.2%, with 4.8% had low birth weight (< 2.5 kg) and 0.4% had high birth weight (> 4.0 kg). Less than half (39.7%) of the infants were exclusively breastfed and 14.0% had been introduced to solid food. Higher birth weight (r=0.182, p=0.006) and general appetite (r=0.157, p=0.017) were associated with higher WLZ, while higher LAZ was associated with lower WLZ (r=-0.157, p=0.017). Higher feeding to soothe score was associated with higher general appetite (r=0.299, p<0.001), but not WLZ in the infants (p>0.05). Monthly household income (B=6.852, SE=0.001, p=0.012), birth weight (B=0.854, SE=0.191, p<0.001), LAZ (B=-0.216, SE=0.059, p<0.001), exclusive breastfeeding (B=-0.297, SE=0.132, p=0.026), and general appetite (B=0.216, SE=0.069, p=0.002), were significant predictors of WLZ (F=3.809, p<0.001) among the infants.

Conclusion: Feeding to soothe may stimulate general appetite of infants, which in turn may lead to higher WLZ in infancy, and thus development of obesity in later life.

PE 11-03 11. Obesity and Metabolic Syndrome in Children and Adolescents

Sociodemographic Characteristics of Mothers Associated with Body Weight Status of Children in Petaling District, Selangor, Malaysia

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Background: Inappropriate complementary feeding practices such as untimely introduction, improper feeding frequency, and low dietary diversity of complementary foods have been widely shown to increase the risk of underweight and stunting among young children. This study aimed to investigate the association between socioeconomic and demographic factors of mothers with complementary feeding practices and body weight status of children in Petaling District, Selangor.

Methods: This was a cross-sectional study involving 141 mothers of children aged 6-24 months recruited through purposive sampling approach. Self-administered questionnaires were distributed among participants comprising of socioeconomic and demographic characteristics of mothers and children, maternal nutritional knowledge, breastfeeding practice, and complementary feeding practice. The height/length and weight of the children were measured to determine BMI-for-age z-score (BAZ) using standardized methodology.

Results: A total of 46.8% male and 53.2% female children, respectively with a mean age of 15.27±6.11 months participated in the study. The average BAZ was 0.167±0.675 with 75.9% of children in the normal, 15.6% in overweight, and 8.5% in wasted category, respectively. Significant association was found between maternal age (X^2=9.707), educational level (X^2=4.553), occupational status (X^2=5.652), and household income (X^2=5.177) with complementary feeding practices, but not on maternal race (X^2=0.017) and maternal knowledge (X^2=0.339). No significant association was also found between socioeconomic characteristics and complementary feeding practices with the weight status of the children (p> 0.05).

Conclusion: Majority of children in this study had normal growth. This study highlights possible factors that were associated with complementary feeding practices and weight status of the children. Other factors should be explored in future to ensure better complementary feeding practices among mothers and optimal growth of the children.

Keywords: Sociodemographic, complementary feeding practices, growth, children

PE 11-04 11. Obesity and Metabolic Syndrome in Children and Adolescents

Direct Parental Involvement in Adolescent Obesity Treatment: A Case Report

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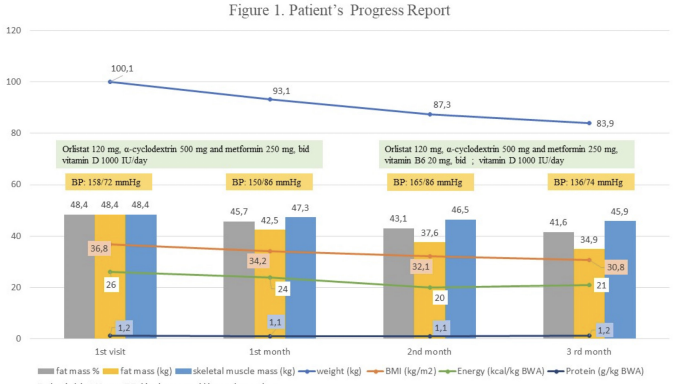
Background: The management of obesity is to achieve weight loss through diet and exercise, which requires the maintenance of behaviour change. Behaviour change is difficult to sustain unless people have support. The social context most likely to support making healthy behaviour changes is the family.

Methods/Case: A 17-year-old female patient visited nutrition clinic with her father, wanted to lose weight because she got tired quickly, sore legs, and menstruation 1 week late every month. Her eating habits: skipping meals, frequent snacking, eating more ready-to-eat foods, and drinking sugar-sweetened beverages. The patient had no regular exercise because of busy school schedule. The patient lived in a boarding house. The patient was diagnosed with obesity based on the CDC (BMI > 95th percentile) and hypertension. The patient received lifestyle modification therapy and pharmacotherapy. Both parents always accompanied and actively participated in nutrition educational therapy, also gave motivation to the patient. A diet plan could be implemented with help from her aunt and grandmother. After a follow-up period, she had no complaints, had improvement in blood pressure without drug, a loss of weight 16.1 kg (16%) and changed in body composition as detected.

Results/Discussion: Obesity treatment in pediatrics has demonstrated the importance of parents' participation in weight control program. Direct parental involvement, defined as parents' presence requested at education sessions, enhances the effectiveness of the intervention. Weight loss was achieved by the patient because of family involvement in lifestyle modification therapy.

Figure 1. Patient's Progress Report



Conclusion: Direct parental involvement appeared to positively impact lifesyle modification intervention effectiveness.

PE 11-05 11. Obesity and Metabolic Syndrome in Children and Adolescents

Factors Associated with Physical Health Literacy in Japanese Junior High School Students: A Survey Based on Attitudes toward Exercise Habits, Diet, and Physical Measurement

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Background: The concept of hHealth literacy, the understanding and application of health information to make appropriate health decisions, is recognized gaining attention as a critical force that determindeterminant ofes health. Early intervention in health literacy education is important, with and many studies have focusedfocusing on the younger generation. In Japan, the prevalence of obesity is an increasing among number of students in all grades up to high school. tend to be obese. Therefore, the purpose of tThis study aimsis to examine the physical health literacy status of junior high school students and identify further related factors to help them junior high school students develop health habits forin the future.

Methods: The study surveyed subjects were 800 junior high school students in A city B, prefecture IbarakiA, in Japan., using aA self-administered questionnaire survey was conducteddistributed by mail method. The primary outcome measures were five aspects of physical health literacy items (:exercise habits, eating habits, health check-ups, physical measurements, and health knowledge. about health). Secondary outcome measures included current health status, breakfast intakeconsumption, feeling of loneliness, and Information and Communication Technology (ICT) use, sense of well-being. The five primary outcomesendpoints were divided into high and low groups, and comparisons were made using the secondary outcomes endpoints were compared.

Results: A total of 616 respondents wereresponses were obtained received (response rate = 77.0%). Signiant differences ($p<0.05$) Health literacy in terms of were found exercise habits, eating habitsdiet, and physical measurements based on differed significantly ($p<0.05$) in terms of current health status, feeling of loneliness, and sense of well-being. FurthermoreIn addition, health literacy regarding the use of in terms of use of health check-ups and health knowledge showed differed significantly difference ($p<0.05$) not only in terms ofcurrent current health status, but also in terms of breakfast intake consumption and time spent using ICT.

Conclusion: The study shows that the The physical health literacy of junior high school student's perceptions of lifestyle and self-awareness differ based on their health literacy, which is influenced by both their health status and awareness of health behaviors. students suggests that their perceptions of lifestyle and self differ depending not only on their health status but also on their awareness of health behaviors. To Prevent lifestyle-related diseases and obesity, We would likeit is important to clarify the structure of health literacy of among junior high school students and to consider new intervention methods for the prevention of lifestyle-related diseases and obesity in the future.

PE 11-06 11. Obesity and Metabolic Syndrome in Children and Adolescents

Factors Related to Japanese Junior High School Parents' Attitudes toward Children's Lifestyle and Eating Habits Focusing on the Health Literacy of Parents

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Background: The problem of disorganized health awareness and habits among junior high school students has been raised. several studies have shown that parents' habits significantly influence their children's lifestyles. Therefore, this study aims to examine parents' attitudes toward their children'slifestyle habits and related factors focusing on their health literacy, in order to help establish healthy habits for junior high school students in the future.

Methods: The study population consisted of 800 parents of junior high school students in A City, Ibaraki prefecture, Japan. A self-administered questionnaire survey was conducted by mail. The primary outcomes were five child-rearing attitudes: lifestyle, eating habits, reading, career counseling, and study habits. Secondary outcomes included parents' health litaracy, ICT use, feeling of loneliness, chilidren's actual lifestyle and eating habits.. The five nurturing attitudes were divided into high and low groups, and a comparative study of the secondary assessment outcomes was conducted.

Results: Responses were received from 567 respondents (response rate = 70.9%). The group with high awareness of their children's efforts to develop a regular lifestyle had significantly higher health literacy and health knowledge regarding their parents' dietary habits ($p<0.05$). The group with high awareness of their children's dietary habits had significantly higher use of health examination results and health knowledge ($p<0.05$). In addition, the group with high awareness of discussing future career paths had significantly higher scores on all health literacy items ($p<0.01$).

Conclusion: The results suggest that different concepts of health literacy are associated with different attitudes towards lifestyle and nutrition in middle school children. The findings suggest the need to consider parents' health literacy when addressing the improvement of junior high school students' lifestyle habits and future health concerns.

PE 11-07 11. Obesity and Metabolic Syndrome in Children and Adolescents

Physical Activity and Weight Status of Primary School Children with Learning Difficulties in Selangor, Malaysia

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Background: Children with different conditions of learning disabilities are vulnerable to becoming overweight or obese due to adoption of various lifestyle practices or exposure to behavioral risk factors. Constant engagement in physical activity can provide maintenance of optimal weight status to the children with learning disabilities despite their underlying conditions. Therefore, the aim of this study is to assess the physical activity level of children with learning difficulties and its association with weight status.

Methods: A cross-sectional study was conducted among 360 learning-disabled children who enrolled in Program Pendidikan Khas Integrasi (PPKI). Parents completed a self-administered questionnaire comprised of sociodemographic section, while Physical Activity Questionnaire for Children (PAQ-C) was used for determining physical activity levels. Children' data including weight and height were obtained and further analyzed using WHO AnthroPlus software to determine their growth status.

Results: Most of the children were male (68.3%), of Malay ethnic group (83.9%) and coming from less than USD1500 income households. Approximately, 52.8% of children with learning disabilities were at a normal weight status, with 11.6% and 35.5% of them being underweight and overweight/obese, respectively. Physical activity was significantly associated with weight status of these learning-disabled children ($r = -0.124$, $p<0.05$). No other sociodemographic factors were associated with weight status of the children except for income and presence of medical conditions ($p< 0.05$).

Conclusion: Most children with learning disabilities in this study had normal weight and could be due to the influence of moderate physical activity performance. However, other factors such as the family household background, children's dietary pattern and severity of the learning disorders are not to be excluded and should be incorporated in future research among this vulnerable group of children.

Keywords: Learning disabilities, children, weight status, diet quality and physical activity

PE 11-08 11. Obesity and Metabolic Syndrome in Children and Adolescents

The role of sugar-sweetened beverages in a late adolescence patient with obesity and chronic kidney disease: A case report

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Background: Obesity is characterized by abnormal fat accumulation and can lead to chronic health complications. This condition is closely linked to lifestyle factors, including the consumption of sugar-sweetened beverages (SSBs), which is a global trend. Obesity is associated with hypertension, and hypertension has a causal relationship with chronic kidney disease (CKD). This study presents a case of CKD due to obesity and hypertension, observed at the Emergency Department of Semen Padang Hospital.

Methods: We reported on a 21-year-old man admitted to the Emergency Department of Semen Padang Hospital due to weakness and dizziness lasting more than three months. He has a history of obesity, uncontrolled hypertension, and frequent consumption of sugar-sweetened beverages. The patient's BMI is 30.86 kg/m^2. Laboratory tests revealed elevated serum urea (116 mg/dl), elevated serum creatinine (15.6 mg/dl), and low hemoglobin levels (7.9 g/dl). The patient was scheduled for hemodialysis, transfusion of packed red blood cells, and anti-hypertensive medication.

Results: Based on the Ministry of Health Republic of Indonesia's classification in 2009, this patient is categorized as a late adolescent. Evaluation indicated a connection between sugar-sweetened beverage consumption, obesity, uncontrolled hypertension, and chronic kidney disease. Habitual consumption of SSBs contributes to weight gain, while CKD may be caused by obesity and hypertension, associated with histopathological findings of obesity-related glomerulopathy and glomerular hypertension. Metabolic products from adipose tissue contribute to various pathophysiological processes such as oxidative stress, inflammation, and endothelial dysfunction.

Conclusion: SSBs, obesity and uncontrolled hypertension can cause CKD. Treating this medical condition necessitates using algorithms that involve decisions from multiple disciplines.

Keywords: Obesity, sugar-sweetened beverages, hypertension, chronic kidney disease

PE 11-09 11. Obesity and Metabolic Syndrome in Children and Adolescents

Obesity and Metabolomic Signatures and Among Children in Asian Landscape

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Background: Childhood obesity is a major public health concern worldwide, with rising prevalence rates posing serious health risks. Metabolomics, as an emerging technology, holds significant potential for studying biochemical pathways to childhood obesity. However, studies characterizing metabolomic signatures in pediatric obesity within the Asian region remain limited. This review aims to explore the use of metabolomics in Asian pediatric studies and identify metabolomic signatures associated with childhood obesity.

Methods: Relevant articles were searched through online databases, including PubMed and Web of Science. Google Scholar was also used to find additional grey literature. This review was conducted in compliance with PRISMA guidelines. The search strategy included the following components: population (Asian children aged 4-12 years old with overweight/obesity); intervention (metabolomics approach, either targeted or non-targeted); comparisons (with/without control group); and outcomes (metabolomic signatures related to obesity).

Results: This study reviewed six metabolomics investigations into childhood obesity conducted in two Asian countries, namely China and South Korea. Metabolomic profiling of pediatric obesity involved analyzing blood and urine samples to comprehensively study metabolic pathways. The findings suggested that amino acid and lipid metabolisms are the most affected pathways in childhood obesity. Alterations in biomarkers of branched-chain amino acids (BCAA), lipids, and several acylcarnitines were linked to childhood overweight and obesity. Additionally, changes in BMI-for-age were positively correlated with higher BCAA concentrations in plasma.

Conclusion: In conclusion, metabolomics enables the identification of valuable biomarkers and metabolic pathways associated with obesity, particularly in amino acid and lipid metabolisms. The findings suggest that alterations in biomarkers such as BCAA, lipids, and acylcarnitine are linked to childhood overweight and obesity. Addressing these issues is crucial because early detection and personalized treatments can prevent the progression of obesity and its associated health complications, thereby improving long-term outcomes for children.

PE 11-10 11. Obesity and Metabolic Syndrome in Children and Adolescents

The triglyceride-glucose index and its relationship to metabolic syndrome in Korean children

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Background: Childhood obesity should be closely monitored and addressed because a significant proportion of obese children and adolescents progress to adulthood with obesity and health problems such as metabolic syndrome (MetS), type 2 diabetes, and cardiovascular disease. We aimed to compare the prognostic values of the triglyceride-glucose (TyG) index and homeostasis assessment model of insulin resistance (HOMA-IR) for predicting MetS.

Methods: The study included 660 children (355 boys and 305 girls) with obesity aged 6 and 11 years. After anthropometric and clinical evaluation, fasting blood samples were collected from the children. Fasting glucose, insulin, triglycerides, resting blood pressure, and high-density lipoprotein cholesterol (HDLC) were measured. HOMA-IR was calculated using the formula: fasting glucose (mmol/L) × fasting insulin (ЧU/mL) / 22.5. The TyG index was calculated as ln [fasting triglycerides (mg/dl) × fasting plasma glucose (mg/dL)/2]. The areas under the curve of TyG and HOMA-IR were compared by receiver-operating-characteristic (ROC) analysis in predicting the MetS.

Results: The overall prevalence of MetS was 8.5% (n=56) in this pediatric population, with girls having a higher trend than boys (6.8% vs. 10.5%, p=0.58). Those with MetS have higher TyG (8.08 vs. 8.84, p<0.001) and HOMA-IR (1.86 vs. 4.18, p<0.001) than those without MetS. The TyG index has a larger ROC area (AUC = 0.910, 95% confidence interval, CI = 0.866-0.954, p<0.001 versus AUC = 0.729, 95% CI = 0.723-0.853, p<0.001) than HOMA-IR.

Conclusion: The TyG index was more convenient and effective than HOMA-IR in assessing MetS risk in schoolchildren (overall model quality of TyG = 0.87 versus overall model quality of HOMA-IR = 0.66). The TyG index is a valuable tool for pediatric research and intervention evaluation.

PE 11-11 11. Obesity and Metabolic Syndrome in Children and Adolescents

Individual Variability in Insulin Sensitivity, Visceral fat and Cardiorespiratory Fitness in Response to Exercise in Adolescents with Obesity

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Background: We examined the influence of exercise training on interindividual variability and response rates above the smallest worthwhile change (SWC) after accounting technical error of measurement (TE) in cardiorespiratory fitness (CRF) and health risk factors in adolescent boys and girls with overweight and obesity.

Methods: We included 143 adolescents (12-18 years, BMI>85th percentile) who participated in randomized exercise trials (3-6 months) at UPMC Children's Hospital of Pittsburgh and had complete baseline and post-intervention data for insulin sensitivity by the hyperinsulinemic euglycemic clamp, visceral fat by magnetic resonance imaging, and peak oxygen uptake during maximal treadmill test (59 aerobic, 58 resistance, and 26 combined aerobic and resistance exercise). Each individual's observed response was compared with the SWC after adjusting for TE and categorized as a 'possible' change (greater than SWC) or 'likely' change (greater than the SWC and beyond the 90th percentile or TE).

Results: In response to 3 to 6 months of aerobic and/or resistance exercise, approximately half to two-thirds of boys and girls in all exercise groups had an improvement in insulin sensitivity that would indicate a 'likely/possible' improvement. For visceral fat, most groups had over 80% of participants having a 'likely/possible' improvement in response to exercise. For peak oxygen uptake, most groups had over 75% of participants having a 'likely/possible' improvement in response to exercise.

Conclusion: Substantial variability in response to standardized exercise was observed for change in insulin sensitivity, and to a lesser degree, visceral fat and CRF after accounting for measurement error in adolescents with overweight and obesity.

PE 11-12 11. Obesity and Metabolic Syndrome in Children and Adolescents

Associations between Skeletal Muscle Lipid, Muscular Strength and Insulin Sensitivity in Adolescents with Obesity

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Background: We examined the associations between skeletal muscle lipid, muscular fitness and insulin sensitivity in adolescent boys and girls with obesity.

Methods and Materials: We included 181 healthy adolescents (77 boys and 104 girls, 12-18 years, BMI>95th percentile). Measurements included insulin sensitivity assessed by a 3-hour hyperinsulinemic-euglycemic clamp, total and intermuscular adipose tissue (AT) and skeletal muscle (SM) mass quantified by whole-body magnetic resonance imaging, and mid-thigh skeletal muscle density evaluated by computed tomography. Muscular strength index was calculated as the sum of the 1-RM scores for the chest and leg press expressed per kg of body weight.

Results: In both boys and girls, insulin sensitivity was inversely associated with total intermuscular AT mass (boys: r= -0.59, girls: r=-0.36), mid-thigh intermuscular AT area (boys: r= -0.41, girls: r=-0.31), and low-density muscle area (boys: r= -0.30, girls: r=-0.33), and these associations remained significant after accounting for race, Tanner stage and muscular strength index. By contrast, insulin sensitivity was not associated with muscular strength index with and without adjustment for race and Tanner stage. After accounting for race, Tanner stage and total adiposity (%), intermuscular AT mass remained significantly associated with insulin sensitivity, explaining 35% and 14% of the variance in insulin sensitivity in boys and girls, respectively.

Conclusion: Independent of total fat, race and sex, skeletal muscle quality is an important determinant of insulin sensitivity in adolescents with obesity.

PE 11-13 11. Obesity and Metabolic Syndrome in Children and Adolescents

Differential Effects of Exercise on Changes in Body Composition and Insulin Sensitivity in Adolescents with Metabolically Healthy versus Metabolically Unhealthy Obesity

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Background: We examined the effects of exercise training on changes in total and regional body fat, and skeletal muscle (SM) in adolescents with metabolically healthy (MHO) versus unhealthy obesity (MUO).

Methods: This is a secondary analysis of our previously published randomized trials of aerobic, resistance, and combined exercise training. We included 70 black and 60 white adolescents (BMI >85th percentile, 12-18 years) who had complete baseline and post-intervention data for total fat and SM quantified by whole-body magnetic resonance imaging, and insulin sensitivity measured by 3-hr hyperinsulinemic euglycemic clamp. Adolescents with glucose disposal (R_d) greater than 13.8 mg/kg•FFM/min were classified as MHO, whereas those with Rd < 13.8 mg/kg•FFM/min were classified as MUO as reported by us previously (Lee and Arslanian, J Adolesc Health. 2019 Mar;64(3):327-332).

Results: In blacks, despite no weight loss, both MHO and MUO groups had significant reductions in visceral fat, intermuscular fat and liver fat, and increases in SM mass following exercise interventions after accounting for sex, baseline value and exercise modality. In Blacks with MUO, there were significant reductions (P<0.05) in total fat, abdominal subcutaneous fat and waist circumference (WC) and increases in mid-thigh SM density, which were not seen in black MHO group. In whites, BMI, waist circumference, and all body fat measures (total, visceral and abdominal subcutaneous fat, and ectopic fat in the liver and muscle) decreased significantly after exercise interventions in the MUO group only. Further, total SM mass and SM density increased significantly in whites, both MUO and MHO groups, and the increases in SM mass and reductions in visceral fat were significantly greater (P<0.05) in the MUO versus MHO group. In both races, significant improvements in insulin sensitivity were observed in the MUO group only.

Conclusion: Although MHO adolescents displayed benefits in response to exercise interventions, the beneficial effects of regular exercise on body composition and insulin sensitivity were more pronounced in adolescents with MUO compared to MHO in both races.

PE 11-14 11. Obesity and Metabolic Syndrome in Children and Adolescents

BMI changes before and after two years of COVID-19 lockdown: a retrospective longitudinal study in single elementary school

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Background: This study aimed to investigate changes in Body Mass Index (BMI) before and after the COVID-19 lockdown by grade and sex, as well as the recovery of BMI after the lockdown.

Methods: We retrospectively reviewed the height, weight, and BMI of students from a single elementary school from 2019 to 2023, excluding 2020 due to the COVID-19 lockdown. We conducted both longitudinal and cross-sectional studies to examine changes in BMI according to grade and BMI status before and after the lockdown.

Results: A cross-sectional study of the entire student body indicated that BMI SDS in 2021, a year after the COVID-19 lockdown, significantly increased compared with BMI SDS in 2019, a year before the lockdown (p=0.009). However, longitudinal studies for each grade showed different results. In 2019, first-grade students experienced a significant decrease in BMI SDS after the lockdown (p=0.003). In contrast, students in other grades showed a significant increase in BMI SDS during the lockdown, with third-grade students in 2019 showing the most significant increase (p=0.027). The increased BMI SDS was more frequently observed in the normal and overweight groups compared to the obese group before the lockdown.

Conclusion: Our longitudinal study indicates that not all children and adolescents experienced increased BMI SDS due to the COVID-19 lockdown. We found that changes in BMI varied depending on obesity status and grade before the lockdown. Therefore, different approaches to controlling and preventing obesity-related metabolic diseases may be required depending on the affected age group and obesity status post-COVID-19.

PE 11-15 11. Obesity and Metabolic Syndrome in Children and Adolescents

Associations between sedentary behaviors, dietary factors and sugar-sweetened beverage consumption among Korean adolescents: A path analysis

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Background: The escalating prevalence of obesity among adolescents presents a significant global health concern, with sugar-sweetened beverage (SSB) consumption closely linked to this issue. Factors associated with SSB overconsumption among adolescents such as dietary habits, sedentary lifestyle, and other health risk behaviors have previously identified. This study aimed to identify modifiable key factors affecting overconsumption of SSB among adolescents and investigate their interconnections through path analysis.

Methods: This cross-sectional study utilized data from the 2022 Korea Youth Risk Behavior Web-based Survey with 49,548 participants. Data on the frequency of SSB consumption, socio-demographic characteristics, eating habits, sedentary behaviors and other health-related factors were collected using self-reported questionnaire. Path analysis was used to develop a model of SSB over-consumption among adolescents and to estimate direct and indirect effects of modifiable factors.

Results: Male students, current alcohol drinkers, those consuming more fast foods and late-night snacks, and those with increased smartphone usage were more likely to overconsume SSB. Correlation analysis revealed positive relationships between SSB consumption and the frequency of watching Mukbang and cooking broadcasts (r=0.085), smartphone usage time (r=0.122), leisure sitting time (r=0.074), fast-food consumption (r=0.301), and nighttime eating (r=0.257), whereas self-perceived health status showed a negative correlation (r=-0.058). Direct path coefficients indicated that leisure sitting time (β = 0.045), negative self-perceived health level (β = -0.039), fast food consumption (β = 0.239), and nighttime eating (β = 0.181) were associated with higher SSB consumption among participants. Leisure sitting time was indirectly and positively associated with SSB consumption, mediated by Mukbang watching, smartphone use, fast-food intake, and nighttime eating. Self-perceived health status was negatively associated with SSB consumption, mediated by fast food intake and nighttime eating.

Conclusion: The frequency of SSB consumption among Korean adolescents was significantly associated with unhealthy eating habits and longer leisure sitting time. Increased fast food intake, nighttime eating, Mukbang watching, smartphone use, and negative self-perceived health status directly affected SSB consumption and acted as mediators in these relationships. Appropriate school health intervention policies to regulate screen time and ultimately promote healthy eating habits are needed.

PE 11-16 11. Obesity and Metabolic Syndrome in Children and Adolescents

Difference of Living Variables According to Body Mass Index of Korean High School Students

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Background: Child and adolescent obesity is increasing worldwide, including Korea, and its importance is being emphasized. Therefore, identifying predictive factors of adolescent obesity is important for preventing obesity and necessary for developing intervention programs.

Methods: The purpose of this study was to investigate the differences in physical activity and eating habits according to the body mass index of high school students using the 2020 National Health and Nutrition Survey. Data were analyzed using independent t-test, one-way ANOVA of the SPSS WIN 21.0 program.

Results: The results of this study showed that physical activity (p = 0.78), physical activity classification (p = 0.50), lunch frequency (p = 0.65), dinner frequency (p = 0.19). There was a difference only in the number of breakfasts (p = 0.04).

Conclusion: These results suggest that the importance of breakfast should be emphasized and breakfast should be prepared at home, considering that the meaning of breakfast is an important variable in high school students' obesity.

PE 11-17 11. Obesity and Metabolic Syndrome in Children and Adolescents

Factors Influencing Obesity in Korean High School Students

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Background: This study was a second analysis study of descriptive research to identify the factors affecting obesity in Korean high school students based on the online survey data of youth health behavior in 2023.

Methods: If the value of the data selected as the main concept of the study in the entire primitive data is missing, the data are analyzed and analyzed using the remaining 3,501 data. Data analysis method was descriptive statistics, correlation analysis and multiple regression analysis using SPSS WIN 20.0 program.

Results: As a result of this study, obesity of Korean high school students was statistically correlated gender(p<.001), grade(p=.003), age(p=.002), smoking(p=.033), diet(p=.002), physical activity(p<.001), subjective body image(p<.001). Factors affecting obesity in Korean high school students are as follows. Gender(β=-.247), physical activity(β=.024), subjective body image(β=.795) variables explained 62.7% of obesity in Korean high school students.

Conclusion: Therefore, in order to prevent obesity in Korean high school students, the development and application of nursing intervention program that can improve the perception of high school students based on physical activity so as to increase physical activity more positively for female students and positively improve subjective body image need.

PE 11-18 11. Obesity and Metabolic Syndrome in Children and Adolescents

Hyperaldosteronism Against the Background of Obesity

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Background: Obesity has become a global epidemic, contributing to the increased prevalence of comorbid conditions, including hyperaldosteronism. This case report presents a 14-year-old female patient with obesity and hyperaldosteronism, highlighting the significance of comprehensive diagnosis and interdisciplinary treatment.

Methods: Laboratory tests revealed elevated aldosterone levels with normal renin levels, suggesting obesity-induced hyperaldosteronism. Imaging studies showed adrenal hypertrophy, further complicating the diagnostic process.

Results: The patient initially received symptomatic treatment for hypertension, emphasizing the need for targeted therapeutic strategies aimed at reducing activity of the renin-angiotensin-aldosterone system (RAAS) and body mass.

Conclusion: This case underscores the importance of early detection and management of hyperaldosteronism in the context of obesity among children and adolescents. Future research should focus on understanding the genetic and molecular mechanisms underlying hyperaldosteronism in obesity and evaluating long-term outcomes of different therapeutic approaches to improve patient care and prevent complications.

PE 11-19 11. Obesity and Metabolic Syndrome in Children and Adolescents

Obesity and the metabolic syndrome in children and adolescents

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Background: Both the frequency and severity of childhood obesity are sharply rising. In a sizable, multiracial, multiethnic cohort of children and adolescents, we looked at the impact of different degrees of obesity on the prevalence of the metabolic syndrome and its relationship to insulin resistance, C-reactive protein, and adiponectin levels.

Methods: Twenty children and adolescents were not obese, 31 were overweight, and 439 were obese when we gave them a routine glucose-tolerance test. Adiponectin levels, C-reactive protein, blood pressure, and plasma lipid levels were all measured at baseline. Blood pressure, high-density lipoprotein cholesterol, and triglyceride levels were corrected for age and gender. We used conversion to a z score to standardise the values for age and sex because the body-mass index changes with age.

Results: As obesity got worse, so did the prevalence of the metabolic syndrome, which in very obese children reached 50%. In overweight and obese subjects, the odds of developing the metabolic syndrome increased with each half-unit increase in body-mass index (converted to a z score) and with each unit increase in insulin resistance as determined by the homeostatic model (odds ratio, 1.12; 95 percent confidence interval, 1.07 to 1.18 for each additional unit of insulin resistance). After adjusting for race or ethnic group and degree of obesity, the prevalence of the metabolic syndrome rose considerably with increasing insulin resistance (P for trend, <0.001). Adiponectin and C-reactive protein levels rose.

Conclusion: Obese children and adolescents have a high incidence of the metabolic syndrome, and this prevalence rises as obesity gets worse. These children already exhibit biomarkers of an increased risk of unfavourable cardiovascular outcomes.

PE 11-20 11. Obesity and Metabolic Syndrome in Children and Adolescents

The Impact of Lifestyle Choices on Chronic Kidney Disease and its Complications in Young Adults: A Case Report and Literature Review

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Background: Chronic Kidney Disease (CKD) poses a significant global health challenge, influenced by multiple risk factors including obesity, abdominal/ central obesity, and hypertension. These conditions are often linked to poor lifestyle choices, such as high intake of sugary foods, sugar-sweetened beverages, deep-fried, and fried foods, along with lack of physical activity. Such risk factors impact both elderly and young populations, increasing the prevalence of CKD and related complications like pneumonia. Pneumonia, a common cause of morbidity and mortality in CKD patients, significantly raises the risk of hospitalization and death compared to the general population.

Case Illustration: A 26-year-old female presented to the Emergency Department with severe shortness of breath for 3 days, worsening over the past 6 hours. She had a 2-week history of productive cough and intermittent fever, along with hemoptysis for 3 days. Diagnosed with CKD and hypertension 1.5 months earlier, she was undergoing bi-weekly hemodialysis. Her diet was high in sugar and fried foods, and she led a sedentary lifestyle. Physical examination revealed a blood pressure of 230/120 mmHg, heart rate of 130 bpm, respiratory rate of 34/min, temperature of 38.5°C, and peripheral oxygen saturation of 84-85%. She exhibited central obesity and edema. Pulmonary examination revealed bilateral rales. Laboratory results indicated low hemoglobin (7.5 g/dl), leukocytosis (18,500), elevated serum urea (229.9 mg/dl), and serum creatinine (11.1 mg/dl). Chest X-ray showed bilateral infiltrates. She was treated with hemodialysis, blood transfusion, and antihypertensive medication. After 3 days in the High Care Unit (HCU), she was transferred to the general ward and fully recovered after 7 days.

Discussion: The patient's obesity and poor lifestyle choices significantly contributed to the development of CKD and hypertension. These conditions predisposed her to severe pneumonia, a common complication in CKD patients due to their compromised immune function. The interplay between obesity, hypertension, and CKD exacerbates the patient's vulnerability to infections and complicates CKD management. Metabolic products from adipose tissue contribute to various pathophysiological processes, including oxidative stress, inflammation, and endothelial dysfunction.

Conclusion: This case underscores the importance of addressing lifestyle factors in young adults to prevent CKD and its complications. Early intervention and lifestyle modifications are crucial in managing obesity, hypertension, and CKD, thereby reducing the risk of severe infections like pneumonia and improving patient outcomes.

Keywords: Abdominal obesity, chronic kidney disease, hypertension, lifestyle, obesity, pneumonia