Oral Presentation 4

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Diet Quality and Obesity Indicators of Malaysian Young Female Adults

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Background: Poor diet quality has been viewed as a modifiable risk factor for obesity. Existing studies investigating the diet-obesity relationship have seldom been described using country-specific diet indices. This study aimed to determine the association between diet quality using the Standardized Malaysian Healthy Eating Index (S-MHEI) and multiple obesity indicators of Malaysian young female adults.

Methods: A cross-sectional study was conducted among 710 Malaysian young female adults from three private and public universities in Klang Valley. Dietary intake was assessed using a 2-day 24-hour diet recall and translated into S-MHEI to determine the diet quality. Obesity indicators, including body mass index (BMI), body fat percentage (BF%), waist circumference (WC), visceral fat (VF), and waist-to-height ratio (WHtR), were determined using stadiometer and TANITA bioelectrical impedance analyzer. Association between variables to test the hypothesis was performed using the Generalized Estimating Equation (GEE) analysis with alpha of 5%.

Results: About 26% and 19% were overweight/obese and overfat/obese, respectively. Meanwhile, 19%, 8%, and 20 % were reported to have abdominal obesity, high risk of cardiovascular diseases, and high cardiometabolic risk related to central adiposity, respectively. Over half (69.7%) reported poor diet quality. Most failed to meet the recommended serving sizes in the Malaysian Dietary Guidelines 2020 for all food and nutrient groups except total grains and meat/poultry/eggs. GEE analysis revealed that the lower S-MHEI scores significantly contribute to higher BF% (B=-0.002, p=0.037), WC (B=-0.001, p=0.044), and WHtR (B=-0.001, p=0.018) after adjusting for covariates. No significant association was determined for BMI and VF (p<0.05).

Conclusion: As measured by S-MHEI, country-specific diet indices were associated with excess adiposity such as BF%, WC, and WHtR, not measures of BMI and VF. Utilizing obesity indicators specific to excess adiposity would accurately ascertain the diet-obesity relationship among this population. Nutrition initiatives to address poor diet quality should consider increasing awareness of the importance of healthy eating to prevent excessive adiposity.

Effects of 8 Weeks of Kinect-based Mixed Reality Exercise and Deep-sea Water Consumption on Metabolic Syndrome: A Randomized Controlled Trial

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Background: The prevalence of metabolic syndrome (MetS) is increasing globally, significantly contributing to the risk of type 2 diabetes and cardiovascular diseases. Deep-sea water (DSW) and Kinect-based mixed reality (KMR) exercise have each shown potential benefits for MetS, but studies examining their combined effects are lacking. DSW, rich in essential minerals, improves lipid metabolism and insulin sensitivity, while KMR, an unsupervised feedback-based exercise program, enhances cardiovascular fitness and metabolic health markers. Therefore, this study aims to investigate the effects of DSW and KMR, both individually and in combination, on improving MetS factor scores.

Methods: A total of 83 participants were recruited and randomly assigned to four groups for an 8-week intervention: 1) Control; 2) DSW consumption; 3) KMR exercise; and 4) DSW + KMR exercise. The intervention was conducted three times per week, and participants in the DSW groups consumed deep-sea water daily. At baseline and post-intervention, measurements included blood pressure, body composition, blood profiles (lipids, glucose, hemoglobin A1c), handgrip strength, depression levels, quality of life, and physical activity.

Results: Forty-eight of the 83 participants (mean age 48.54 ± 9.46 years) completed the study. After the intervention, the exercise groups (KMR, DSW+KMR) showed 98.4% compliance, and the consumption groups (DSW, DSW+KMR) showed 99.2% compliance. Among MetS factors, waist circumference significantly decreased in the DSW ($p = 0.002$), KMR ($p < 0.0001$), and DSW+KMR ($p < 0.0001$) groups, with a significant difference between the Control and KMR groups ($p = 0.02$). Additionally, MetS component scores significantly declined in the KMR ($p = 0.0042$) and DSW+KMR ($p = 0.0016$) groups, with mean values of 2.60 and 2.83 falling below the diagnostic threshold of 3 points.

Conclusion: These results suggest that while both DSW and KMR interventions are individually effective in improving metabolic syndrome, their combination appears to offer more substantial benefits.

OP 4-3   7. Other Comorbidities of Obesity and Metabolic Syndrome

Diabetes Mellitus as a Predictor of Severe Hospitalization and Death in Patients with Cardiovascular Diseases: Evidence from the Indonesian National Health Insurance Claim Database

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Background: As the world's largest single-payer national health insurance program, and the country with the fifth-highest number of diabetes mellitus (DM) globally, Indonesia experiences immense health and financial burdens from DM. However, the indirect medical and cost consequences of DM remain underexplored, including in patients with cardiovascular diseases (CVD), in which DM is known to be a strong risk factor. Therefore, we aimed to investigate the additional burden of DM comorbidity in patients admitted to hospitals with CVD.

Methods: In this cross-sectional analysis of 872,201 hospital admissions from the National Health Insurance Database, CVD (primary) and DM (secondary) diagnoses were identified using ICD-10 codes. We performed logistic regressions to examine whether the presence of DM comorbidity in CVD patients was associated with worse hospitalization outcomes, including extended hospital stays, need for more-than-standard procedures/medications, and mortality. Associations were adjusted for sociodemographic confounders, and stratified by sex, age, class of inpatient ward, and geographical setting to identify potential effect modification.

Results: CVD accounted for 2.1% of all hospital admissions. DM comorbidity was associated with poorer outcomes in CVD patients, particularly those aged>65years [AOR(95%CI): 5.34(1.05-27.07)], staying in third-class inpatient wards [3.16(1.06-9.39)], and residents of Java Island [2.39(1.05-5.44)]

Conclusion: As measured by S-MHEI, country-specific diet indices This nationally representative study indicates that DM comorbidity exacerbates complications and expenses in CVD patients. Further research on the indirect medical and cost consequences of DM in other diseases is essential to comprehend the full burden of DM in Indonesia. Urgent public health interventions are crucial to mitigate the severity of DM in the country.

OP 4-4   11. Obesity and Metabolic Syndrome in Children and Adolescents

Nutritional quality of canteen menus and knowledge, attitude, and practice of school canteen managers towards DepEd Order No. 13, s. 2017 in public elementary schools in Los Banos, Laguna, Philippines

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Background: The DepEd Order (DO) No. 13, s. 2017 was issued to promote healthy eating habits to pupils. However, the high rate of malnutrition among school-age children in the province of Laguna in the Philippines led us to question the strict implementation of this policy in educational institutions. This study aimed to determine the nutritional quality of foods and beverages in public elementary school canteens in Los Baños, Laguna; to assess the knowledge, attitude, and practice (KAP) of canteen managers towards the DO; and to evaluate school compliance with the DO.

Methods: A pretested questionnaire was used to determine the KAP of 10 canteen managers along with a canteen monitoring checklist to evaluate their compliance to the DO. Lastly, a semi-structured interview was conducted to obtain the list of foods and beverages offered in school canteens.

Results: Findings show that the knowledge of participants in the DO is good (97.27%) while their knowledge in categorizing food items according to the traffic light system is moderate (72.08%). An overall positive attitude (83.00%) towards the DO was also observed. Meanwhile, 80.00% of participants lacked training regarding food and nutrition which is reflected through their moderate operational compliance (71.25%) and good administrative compliance (82.78%) to the DO.
Remarkably, the menus showed low nutritional quality as snacks high in refined sugar are more prominent, whereas sources of protein, vitamins, and minerals are lacking in school canteens. The increased availability of confectionery and sweets in school canteens can influence the overconsumption of sugar among children which has been associated with overweight and obesity, poor diet quality, and inadequate nutrient intake.

Conclusion: Given that school canteens can heavily influence the dietary behavior of pupils, poor diet quality may be established among children if school canteens continue to operate with these menus. Thus, recommendations to improve policy implementation include the redevelopment of canteen menus, knowledge enhancement of canteen managers through periodic training, and the strict monitoring of school canteen practices. Further studies may also be done to assess other enablers and barriers to the implementation of the DO.

OP 4-5   3. Epidemiology of Obesity and Metabolic Syndrome

Mediating Effect of Insulin Resistance and Physical Activity on the Association between Body Mass Index and Metabolic Syndrome in Korean Children

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Background: Obesity-related metabolic syndrome is etiologically linked to physical inactivity and insulin resistance. Little is known about how insulin resistance and physical activity interact to influence the relationship between body fat and metabolic syndrome in pediatric populations. This study aimed to investigate the mediation effect of fasting insulin and physical activity on the relationship between body mass index (BMI) and continuous metabolic syndrome (cMetS) score in 1,008 Korean children aged 7 to 12 years older (535 girls and 473 boys).

Methods: Body composition measurements included body mass index and percent body fat. Physical activity was objectively assessed by wearing an accelerometer for 7 days. The cMetS score was calculated by summing the standardized residuals for waist circumference, mean arterial pressure, triglyceride, fasting blood glucose (FBG), and high-density lipoprotein cholesterol (HDLC). The standardized HDL-C was multiplied by -1 since it is inversely related to metabolic syndrome.

Results: Girls were more physically active, but they had higher BMI, FBG, and cMetS scores than boys. Stepwise linear regression analysis showed that gender, BMI, insulin, and vigorous physical activity (VPA) were significant determinants of cMetS. Mediation analysis found a significant indirect effect of the impact of BMI on cMetS score through insulin (β= 0.095, 95% CI = 0.074-0.117) and VAP (β= 0.006, 95% CI = 0.002-0.011). The direct effect of BMI on cMeT score in the presence of the two mediators was also significant (β= 0.328, 95% CI=0.290-0.367).

Conclusion: The current findings suggest that both IR and physical activity partially mediate the relationship between BMI and cMetS in Korean children.

OP 4-6   3. Epidemiology of Obesity and Metabolic Syndrome

Trends and Implications of Metabolic Syndrome in Korea, 2007-2022: A Nationwide Study

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Background: This study aimed to analyze the prevalence trends of metabolic syndrome (MetS) among Korean adults over 15 years.

Methods: A cross-sectional study was conducted, using data from the Korea National Health and Nutrition Examination Survey (KNHANES) from 2007 and 2022. The study included 87,397 subjects. MetS was defined according to the National Cholesterol Education Program-Third Adult Treatment Panel (NCEP-ATP III) and the Korean Society for the Study of Obesity (KOSSO) criteria.

Results: MetS prevalence increased from 22.8% in 2007 to 28.6% in 2022, but showed sex difference with men increasing (from 24.5% to 36.8%), and women decreasing (from 20.6% to 19.5%). Among the components of MetS, hyperglycemia and abdominal obesity showed the largest increases (1.51-fold, and 1.29-fold, respectively). While hyperglycemia increased in all age groups, abdominal obesity increased most in men aged 30-39 (1.98-fold) and 19-29 (1.81-fold). Low HDL-C was the only component that decreased (0.62-fold) and was more prevalent among women. In sub-analysis of those aged 65 and older, MetS increased in both men and women, but was more prevalent in women. Individuals with MetS had higher rates of current smoking, heavy drinking, physical inactivity and carbohydrates consumption.

Conclusion: The prevalence of MetS is gradually increasing in Korea, and hyperglycemia and abdominal obesity are rapidly increasing, especially in younger men. Although the prevalence of MetS in women is decreasing due to changes in social environment, continuous efforts are needed for postmenopausal women. Targeted health policies and interventions should be established.