

## **A14 Association between community and consumer food environment with Body Mass Index (BMI) status among adolescents aged 13 to 17 years in Sandakan, Sabah**

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This study aimed at determining the association between the community food environments (Distance of food outlets, number of food outlets within residential area), and consumer food environment (Price of food items in the food outlets, availability of healthy food items in the food outlets) with Body Mass Index (BMI) status among adolescent aged 13-17 years old. Measurement data on the weight and height of 203 adolescents who lived in Sandakan (82 boys, 121 girls) were obtained from the self-reported questionnaire via Google Form and the BMI was classified using the Classification of BMI-for-age (z-score) for children aged above 5 years old. Quantum Geographic Information System (QGIS) was performed to determine the distance and number of food outlets within 1000 m radius from the adolescent residential address. Besides, the validated observational tools (Nutrition Environment Measures Survey for Stores (NEMS-S) and Nutrition Environment Measures Survey for Restaurants (NEMS-R)) were used to identify the scores of prices and availability of healthy food items in the food outlets. Chi-square of Independence and Pearson Moment Correlation test were conducted to examine the association between the distance of food outlets from residential area, numbers of food outlets (none or more than one outlet), price of food items in the food outlet scores, availability of healthy food items in the food outlet scores with BMI-for-age of the adolescents with adjustment for age, gender, ethnicity, parental monthly household income, parental educational level, and parental BMI status. As a result, it showed that the majority of the adolescents BMI-for-age was categorized as normal (70.4%), followed by overweight (27.6%) and thinness (2.0%). Besides, there was no significant association between the distance of food outlets from residential areas with BMI status of the adolescents, except for restaurants ( $p=0.04$ ) and fast foods ( $p=0.006$ ). Moreover, there is no significant association between the numbers of food outlets within the 1000m residential area with BMI status of the adolescents, except for the convenience store ( $p=0.004$ ), fast food outlets ( $p=0.000$ ) and restaurant ( $p=0.000$ ). Both price and availability of food items in the food outlets had significant positive correlation with BMI status of the adolescents. The study suggests that limiting the number of fast-food outlets and restaurants in residential areas could have a significant effect in reducing the prevalence of overweight and obesity among adolescents. Most important, lower prices and higher availability of healthy food items in the food outlets were associated with better BMI status.