

# Measuring the Obesogenic Environment for Elementary School Children and Impacts of body compositions: A GIS-based Walkability Measures Study

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## Abstract

**Introduction:** There is increasing evidence that the school food environment contributes to childhood obesity and health in various locations. GIS-based walkability measures designed to explain proximity to health food. These constructs should be considered when measuring potential child Obesogenic environments.

**Data/Methods:** A total of 2283 schoolchildren aged 6–13 years in 359 townships/districts of from the Elementary School Children's Nutrition and Health Survey in Taiwan conducted in 2001–2002. We investigated the influence of fast-food stores and convenience food stores (FS and CS, respectively) on growth and body composition. Anthropometrics and birth weight of schoolchildren were obtained. Geocoded mapping of schools and food outlets was conducted. Circular buffer of 500, 700, 900, and 1000 meters were calculated from each school, 500 m corresponding to an approximate 10 min walk distance for schoolchildren and 900 - 1000 m for parents. Fast-food store (FS) and Convenience store (CS) availabilities were computed within this buffer area. Multivariable linear regression models, adjusted for father's ethnicity and education, as well as for household income, pocket money, birth weight, physical activity, television watching, food quality and region, were used to predict the correlation between body composition and density of food stores from school food environments.

**Results:** In the fully adjusted models, there was significant BMI positive correlation between FS densities within 500m (10 minutes walkability for child) and 900m (10 minutes walkability for parent) in boys with all models. FS densities within 900m also predicted BMI in girls, but not in 500m. Waist circumference and triceps skinfold thickness did not appear any effects in term of walkability distance. CS did not have effects evident with FS for either boys or girls.

**Conclusions:** The finding also indicated that the residential densities for North-east Asian food culture are inference not only by child, but also by their parent. Some of the breakfast and lunch for children were depend on the takeout meals by their parents. Our finding presented the GIS methods to identify the proximity of nutrition environment indicators of child obesogenic environment which can be used for future child obesity issues.