Associations between walkability, physical activity and body fat in Hong Kong adolescents

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Introduction: Neighbourhood walkability can be associated with accrued levels of daily physical activity (PA) and this may have a resultant influence on levels of body fat. Growing evidence suggests a likely trend that residents living in high walkable neighbourhoods tend to accumulate more physical activity and may have lower obesity levels than those living in low walkable areas, although much of this research has been delimited to Western populations, predominantly on adults, and from low or medium density cities. The influence of neighborhood walkability on Asian adolescents, especially in ultra-high density cities is largely unknown. The main aims of this study were to examine if neighborhood walkability is associated with i) various levels of objectively-measured PA, ii) different patterns of how PA is accrued, and iii) if body fat is associated with these levels of PA.

Methods: A convenience sample of 188 adolescents (mean = 15.3 ± 2.2 SD years) was recruited using an intercept method from 32 neighbourhoods in Hong Kong that varied in socio-economic status (High v Low mean household income) and objectively-measured walkability (High v Low street connectivity and dwelling density). Actigraph accelerometers were used to measure daily PA (at least 5 days with >10 hr/d); body fat was estimated from triceps skinfold thickness, waist circumference, as well as a validated portable bio-electrical impedance analysis (BIA, Tanita) system. A total of 69 adolescents provided complete data for the final analysis.

Results: No significant difference was found in total PA between adolescents living in High v Low Walkable areas (246 v 263 min/d; effect size = 0.27); yet those living in Low Walkable areas accrued significantly more light activity (238 v 209 min/d; effect size = 0.49), whilst those living in High Walkable areas accrued significantly more moderate-to-vigorous PA (MVPA: 37 v 25 min/d; effect size = 0.71). These differences mainly occurred in the short 1–4 and 5–9 min bouts of PA. Only the triceps skinfold was significantly associated (negatively) with levels of MVPA.

Discussion: Adolescents living in high- and low-walkable neighbourhoods in an ultra-high density Asian city do not conform to the PA habits often seen in Western adults. A larger and more representative study that includes the influence of confounders is justified.

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