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Title

Parental Support and the Built Environment: A 4-Way Decomposition Analysis of Children's Physical Activity

Priority 1 (Research Category)

Obesity, exercise and nutrition

Presenters

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Abstract

Context: Individual, social, and built environments interact to shape physical activity (PA), with responses to environmental cues often differing by gender. Such cross-level interactions are widely acknowledged, yet rarely reported. Light physical activity (LPA) is infrequently studied, yet may be particularly sensitive to such influences.

Objective: To estimate the gender-specific average exposure effects of built environment (BE) features on minutes of LPA in children, exploring the potential contribution of social support (SS) as both moderator and mediator.

Methods: Data were from the QUALITY cohort, an ongoing investigation of the natural history of obesity in 630 Quebec families. A prospective analysis was undertaken using data collected in 2008-2010. BE features (pedestrian aids, traffic calming features, neighborhood disorder, park frequency) were measured using audits and a GIS, prior to children's clinical visit; all other measures were collected during or shortly after their clinical visit. PA was measured using accelerometers. SS was measured using the Sallis Parental Scale. VanderWeele's 4-way decomposition analysis method was performed on each exposure. Sex-specific models controlled for age, income, parental education, and MVPA.

Results: There were 204 girls and 250 boys aged 11 years on average. Boys and girls accumulated 361 (SD: 62) and 348 (SD: 58) minutes of LPA on average, respectively. Estimated total average effects of the 4 built environment features on LPA ranged from 3 to 11 minutes in boys, and -7 to -2.7 minutes in girls. In 4-way decomposition, little of the total effect was due to mediated interaction or pure mediation. SS emerged as an effect modifier of most associations between BE features and LPA. When isolating the controlled direct effect, distinct patterns emerged. In the presence of SS, all BE features were positively

associated with LPA in girls, while only park frequency and traffic calming features were positively associated with LPA in boys. In contrast, in the absence of SS, apparently favourable BE features were only weakly and often negatively associated with LPA in boys and girls.

Conclusions: In our population, the total average effect of the BE on LPA was small, and negative in girls. Although there was little evidence of a mediating role for SS, it emerged as a strong and consistent moderator. Overall, this approach could be applied in a variety of contexts to explore mediating and moderating roles.

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