Abstract

Local Retail Food Environment Exposure and Diet Quality in Rural and Urban Adults: A Longitudinal Analysis of the ORISCAV-LUX Study †

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Abstract: Background and objectives: Increasing evidence suggests that complex measures of exposure accounting for the relative presence of healthy and unhealthy food outlets are more strongly associated with dietary pattern that absolute measures of the food environment, although evidence is limited by the cross-sectional design of existing studies. This study examined the long-term associations between absolute and relative measures of neighbourhood food environment and diet quality in Luxembourg. Methods: We used data of 566 adults participating in both waves of the population-based ORISCAV-LUX study (Wave 1: 2007–2009, Wave 2: 2016–2017). Diet quality was estimated in both waves using the Diet Quality Index-International (DQI-I), assessed with a 174-item food frequency questionnaire. Exposure to healthy and less healthy food outlets was computed within a 1000 m street network buffer around the participants’ home address using both absolute (density, spatial access) and relative (proportion) GIS-based measurements. We used linear mixed models adjusted on individual-level covariates and neighbourhood socioeconomic status to estimate associations between cumulative exposure and change in local retail food environment and DQI-I, and tested modification by neighbourhood socioeconomic status. Results: There was a significant decrease in DQI over 10 years from 62.4 to 60.9 (p < 0.0001). Less healthy food outlets increased by +56% over the 10-year. The results showed a 56% increase in less-healthy food outlets over the period. In an adjusted mixed-effects linear regression, high (vs. low) cumulative exposure to less-healthy food outlets is associated with lower DQI-I, when examining spatial access (β = −1.25, 95% CI: −2.29, −0.22) and proportions (β = −1.24, 95% CI: −2.15, −0.33). Stratification shows these associations to be significant only among urban residents. There was no association between change in exposure to less-healthy food outlets and DQI-I. Among rural residents, increased exposure to healthy food outlets over time was associated with worsened DQI-I when examining absolute measurements (density and spatial access). This unexpected result brings into question the ability of absolute measurements to fully capture the healthiness of food environments. Neighborhood socioeconomic status did not moderate the above associations. Discussion: Our results suggest that the relative contribution of unhealthy food outlets in the neighbourhood may play a role in the deterioration of the quality of the population’s diet over time, and should be given special attention by public authorities.

Keywords: foodscape; dietary indices; longitudinal; geographic information system; neighborhood effect
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