

Prevalence and potential determinants of obesity in Northern Irish schoolchildren, using geographical information systems (GIS)

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The increased prevalence of childhood obesity is linked with several behavioural and social factors⁽¹⁾. Socio-economic deprivation has traditionally been associated with poorer health and increased prevalence of overweight–obesity⁽²⁾. The aim of the present study was to examine behavioural and social correlates of childhood overweight–obesity in a group of Northern Irish schoolchildren using data collected as part of a cluster-sampled cross-sectional study of schoolchildren. Data collected included anthropometry (height, weight) and child and/or parental questionnaires on early-life exposures (including birth weight and early infant feeding practices), physical activity (self-reported) and parental adiposity (self-reported). A GIS approach, using unit postcode address information and the Northern Ireland multiple deprivation measure (NIMDM 2005), was applied to assign an area-based rank measure of economic deprivation to each child⁽³⁾. The measure, calculated at the small-scale census output area (OA) level, is based on three weighted domains of deprivation: income (41.7%); employment (41.7%); proximity to services (16.6%). Associations were estimated using logistic regression analysis and expressed as unadjusted or adjusted (for gender and/or parental weight status) OR and 95% CI.

In total 1066 children (398 aged 6–7 years, 668 aged 12–13 years) participated, with similar numbers of boys and girls. The prevalence of overweight–obesity using UK90 definitions⁽⁴⁾ was 20.8% in the 6–7 year olds and 33.3% in the 12–13 year olds. Unadjusted OR showed that higher birth weight (>3.5 kg) was associated with a 2.4-fold increased risk of being overweight–obese at age 6–7 years ($P=0.004$) whereas in the 12–13-year-old group female gender and low physical activity levels was associated with an increased risk of being overweight–obese (1.7-fold and 2.3-fold respectively, both $P=0.001$). In both age-groups unadjusted OR showed that having two parents who were overweight or obese was the strongest predictor of being overweight–obese in childhood (for the 6–7 year olds OR 3.5 (95% CI 1.6, 7.8), $P=0.002$; for the 12–13 year olds OR 2.7 (95% CI 1.4, 5.0), $P=0.003$). In the final models (adjusted for gender and/or parental adiposity status) these associations held with the factors most significantly associated with childhood obesity being birth weight >3.5 kg in 6–7 year olds and low physical activity and female gender in the 12–13 year olds. In both age-groups childhood obesity was strongly associated with both parents being overweight–obese (for 6–7 year olds OR 3.7 (95% CI 1.7, 8.5); 12–13 year olds OR 2.7 (95% CI 1.4, 5.2); both $P<0.001$). In contrast to other methods used for categorising socio-economic deprivation at the individual level, the GIS approach represented a low subject burden method and avoided the need for intrusive questioning about personal circumstances. Outcomes from GIS revealed no significant difference between small-scale area deprivation and risk of overweight and obesity in children. Family-based strategies to combat parental obesity and encourage physical activity in younger Northern Irish individuals are needed urgently.

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