Proceedings of the Nutrition Society (2008), **67 (OCE8)**, E411 doi:10.1017/S0029665108000852

Summer Meeting 30 June–3 July 2008

An obesity prediction instrument for childhood and adolescence developed using a scoring system derived from the Foresight obesity systems map

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The Foresight obesity system map (FOSM)[1] can be abstracted and used predictively to identify non-overweight and non-obese 7-year-old children who are at greatest risk of becoming overweight or obese by the ages of 11 and 16 years[2]. In the present analysis the extent to which such prediction varies among males and females was examined, and the odds of future overweight or obesity among at-risk children as compared with their peers who were least at risk was estimated. This predictive instrument was tested using longitudinal data from 9667 participants in the 1958 National Child Development Study. Three conditioning factors and three intervention factors derived from the FOSM were used to generate a two-way obesity prediction score that ranged from 0 to 3 in each case. The conditioning factors were obesity risk factors in a child's past, such as low birth weight and short duration of breast-feeding, while the intervention factors were of the present (e.g. satiety, activity levels) and potentially modifiable. Children who were low risk for all six factors had a total obesity prediction score of 0 and were classified as C+I+ ('healthy'). Children who scored between 1 and 3 for conditioning factors or intervention factors were classified as C– or I– respectively; the children classified as most at risk had negative indicators in both categories (C–I–). All children in this analysis had a BMI at age 7 years that was below the age- and gender-specific cut-off[3] for an adult equivalent BMI of 25 kg/m^2. For children classified as C–I– at age 7 years the OR of becoming overweight or obese at 11 years of age, relative to those classified as C+I+, were 2.24 (95% CI 1.25, 3.99; $P<0.01$) for males and 2.12 (95% CI 1.27, 3.54; $P<0.01$) for females. For the same children the OR of becoming overweight or obese at 16 years of age, relative to those classified as C+I+, were 1.99 (95% CI 1.04, 3.84; $P<0.05$) for males and 1.32 (95% CI 0.74, 2.36) for females. This overweight and obesity prediction instrument identified the majority of overweight and obese children, on the basis of conditioning and intervention scores combined, at 11 years (males, 76%; females, 73%) and 16 years (males, 77%; females, 74%). It was more successful at predicting overweight and obesity according to conditioning factors rather than intervention factors in this age range. This obesity prediction instrument gives clear prospective identification of overweight and obesity by 11 and 16 years of age among non-overweight non-obese children at the age of 7 years.

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