Commentary: The relationship between parity and overweight—a life course perspective

Gita Mishra* and Diana Kuh

The prevalence of obesity is a rising epidemic of global proportions. No longer is it just a concern for rich countries but increasingly a problem for many developing countries. Obesity is recognized as having both multifarious causes and health-related consequences that are evident from early life and throughout the lifespan. For women in the developed countries, child bearing has been identified as a risk factor for weight gain and obesity. Women often report that their obesity had been triggered by pregnancy—as many as 40–50% in one Swedish study. Yet, for 30% of the women in the same study, pregnancy was associated with a weight loss. In another cross-sectional study from Sweden, sociodemographic factors and health behaviours, such as education and physical activity, had greater effect on BMI than child bearing. In a US national study it was found that, after adjusting for a wide range of covariates, the associations varied with race and were neither strong nor linear: in comparison with women without children, black women living in metropolitan areas with one or two children had increased BMI, while white women living in non-metropolitan areas had lower BMI. These cross-sectional studies allude to a complex parity–weight relationship for women with a range of confounding factors that act across the life course, with the possibility for further variations for those outside of the developed countries.

In this issue of the International Journal of Epidemiology, Kim et al. investigate the association between parity and being ‘overweight’ (BMI ≥ 25 kg/m²) using nationally representative cross-sectional surveys from 28 low- and middle-income countries that were undertaken between 1996 and 2003. The study addresses the relationship with respect to household wealth and national development. It represents a useful refinement of their previous research that carried out a similar analysis at the country level, but assumed that the effects of country development on parity–overweight relationship were uniform across the population. The latest study found that increasing parity had a weak positive relationship with the prevalence of BMI ≥ 25 kg/m² which varied by household wealth and the national human development of the country.

Increased parity for women in the highest third of income was associated with being in this overweight category irrespective of the national development. In contrast, for women in the lowest and middle household groups, the positive relationship was only found for those in the most developed of these low- and middle-income countries. These results raise methodological questions, some of which lie beyond the scope of this study, so it is worthwhile to place the findings in a wider context.

When BMI is dichotomized as overweight (≥25 kg/m²) or not, limitations are placed on how far the findings can be interpreted. BMI typically has a differential relationship, or some variant of a U shape, with health outcomes such as diabetes and cardiovascular disease risk. So the impact of BMI can be delineated more fully when it is treated as a continuous or categorical variable, as defined by the WHO classifications ranging from very underweight to very obese. Even boundary values for defining BMI in terms of these risk categories have been suggested as varying for different races (and hence potentially for different countries or regions).

Another issue is that of reverse causality, since extremes of body weight during reproductive life stages are associated with reproductive irregularities, including increased risk of infertility and menstrual problems. For instance, being underweight is associated with poor fetal growth and elevated pregnancy loss, while obesity is more strongly associated with diseases in pregnancy, pregnancy loss and stillbirth. Hence, those with extremes of BMI may have low parity which may explain the weak positive relationship between parity and having BMI ≥ 25 kg/m².

One perspective not available from this study would be to examine change in weight during the reproductive life stage. Measurement of BMI before and after the first and subsequent pregnancies would identify cumulative weight gain between successive pregnancies and aid our understanding of the role of parity in the development of obesity in women. Research into the causes of obesity has revealed factors acting across the life course and across generations. In particular, four periods during early life (infancy, the prenatal period, the period of adiposity rebound and adolescence) have been shown to be particularly important in its development. Factors during this time such as parental adiposity, birthweight, early-life socioeconomic factors, diet, and physical inactivity have all been linked to adult obesity. There are several later risk factors including lack of education, physical inactivity, smoking habit and the onset of menopause, but for many, the effects appear to be modest by comparison. Findings from the MRC National Survey of Health and Development, a cohort of British women born in 1946 with heights and weights measured regularly throughout life, indicate that the initial positive gradient between parity and BMI was attenuated when
adult and childhood social class and other behavioural factors (cigarette smoking and physical inactivity) were taken into account.15

In spite of its limitations, such household income group comparisons for countries with low and middle human development presented by Kim et al.6 are useful in shedding light on the relative strength of the associations between parity and BMI ≥ 25 kg/m². This is particularly the case as most of the previous research has been obtained from studies in high-income countries. But, it also serves to highlight the importance of expanding existing studies and to initiate life course research to track weight trajectories for women in these low- and middle-income countries. Ultimately, this may provide the kind of detailed information needed to help formulate public health policies in the future as these countries become increasing wealthy and urbanized.

Conflict of interest: None declared.

References

7 Kim SA, Stein AD, Martorell R. Country development and the association between parity and overweight. Int J Obes (Lond) 2006.
12 Dietz WH. Periods of risk in childhood for the development of adult obesity—what do we need to learn? J Nutr 1997; 127:1884S–06S.
15 Hardy R, Lawlor DA, Black S, Wadsworth MEJ, Kuh D. Number of children and coronary heart disease risk factors in men and women from a British birth cohort. BJOG, revised version being considered.