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## The association between mode of delivery and early adulthood obesity or overweight in an urban South African birth cohort

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**Background:** Obesity or overweight is a significant public health problem with rates that have reached epidemic proportions in both high and middle-income countries. South Africa has one of the highest rates of obesity or overweight in Africa, about 38% of the South African population and about 44% of adults were estimated to be overweight or obese in 2013, and these rates are consistent with increasing caesarean delivery rates (CS). The CS rate in South Africa was about 70.8% in the private sector and 24.7% in the data from the aggregated routine health service based information in 2014. There have been studies on the association between mode of delivery and later life obesity or overweight as a result of the emerging reports that CS – born infants possess low bacterial richness or diversity after birth and the microbes that colonize their gut allows them to harvest more nutrients from their diet, this is therefore presumed to persist to adulthood. The aim of this research project was to determine if mode of delivery is a predictor of early adulthood obesity or overweight.

**Methods:** This was a cross-sectional analysis of an ongoing prospective South African birth cohort established to monitor the well-being, health, educational progress and growth of urban children in 1990. A total of 890 young adults age 21-24 with data on mode of delivery and BMI were analysed for this study. Pearson's chi-square and Kruskal-Wallis test were used to assess the association between covariates and BMI categories and proportion of obesity or overweight across mode of delivery strata. Unadjusted and adjusted multinomial logistic regression models were fitted to examine the association between mode of delivery and early adulthood obesity or overweight and sex-stratified analysis were also computed.

**Results:** Of the 890 participants, 89.1% were born vaginally, 2.7% were delivered by assisted VD, and 8.2% were delivered through CS while participants with normal BMI were more common than those underweight, overweight or obese. About 19.6% and 11.9% young adults were overweight and obese respectively. It was observed that participants delivered through normal VD had a higher rate of being overweight while participants delivered through CS had a higher rate of obesity (when compared to other modes of delivery). The rate of overweight and obesity was higher in females than in males and females delivered by CS had higher rates of overweight or obesity than males delivered through CS. In the unadjusted model (model 0), the odds of obesity among participants delivered through CS was 1.89 times the odds of obesity in those delivered through normal VD (95% CI 0.98-3.62) when compared with normal BMI participants. While the odds of overweight among participants delivered through CS was 0.02 times less than the odds of overweight those delivered through normal VD (95% CI 0.51 – 1.87) when compared with normal BMI participants. After adjusting for young adults' sex, age at visit, ethnicity, completion of grade 12, birth weight and mothers' gestational age, parity, mothers' level of education at participants' birth and age at participants' birth (model 1), there was a little change in the odds of obesity but increased odds of overweight was observed in CS delivered participants (i.e. OR 1.91, 95% CI 0.91-3.98 and OR 1.04, 95% CI 0.51-2.10 respectively).

**Conclusion:** This study estimated that 21-24 year olds delivered by CS had higher odds of obesity when compared with those delivered through normal VD adjustment for potential confounders, although the association was not statistically significant (only marginally). The lack of significance in this study might be due to the limited sample size (especially low number of CS), and further studies are required in this setting (South Africa and Africa in general) with larger sample size to confirm the findings and explore mechanisms underlying the association.

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