

Victora CG, Horta BL, Loret de Mola C, Quevedo L, Pinheiro RT, Gigante DP, *et al.*

Association between breastfeeding and intelligence, educational attainment, and income at 30 years of age: a prospective birth cohort study from Brazil.

Lancet Glob Health. 2015; 3: e199-205.

Introduction

International organizations recommend: 1) early initiation of breastfeeding within one hour of birth, 2) exclusive breastfeeding for the first 6 months of life, and 3) the introduction of nutritionally-adequate and safe complementary foods at 6 months together with continued breastfeeding up to two years of age or beyond (1). The beneficial effects of breastfeeding on both short-term and long-term health are well established (2, 3), including effects on cognitive development. In particular, a meta-analysis of 14 observational studies found that breastfed infants scored 3.5 points higher (95% confidence interval (CI) 1.9 – 5.0) on intelligence tests in childhood and adolescence (3).

This issue of NNA summarizes an article published in the *Lancet Global Health* which reported on the results of a prospective, population-based birth cohort. The aim of the study was to assess whether breastfeeding duration was associated with IQ, years of schooling and income at 30 years of age. Although this article reports on results from Brazil, its findings may also be relevant globally, including in Africa.

Methods

The birth cohort study was initiated in 1982, when five maternity hospitals in Pelotas, Brazil were visited daily to identify all births. A total of 5914 newborns were examined, and their mothers were interviewed soon after delivery. Only 1% refused to participate and the cohort was followed up several times. In 1984, 5161 individuals (87%) were interviewed about the duration of breastfeeding and the age of introduction of complementary foods. The average age of participants was about 19 months. In 1986, 4979 participants (84%) were traced and information on breastfeeding duration was obtained for those with missing information. The duration of predominant breastfeeding was defined as the age when foods other than breastmilk, teas or water were introduced. Exclusive breastfeeding was seldom practiced at the time. Participants who had never been breastfed and those who were breastfed for less than 1 month were combined in the

present analyses.

From 2012 to 2013, participants were re-contacted and invited to visit a research clinic for an interview and an exam. Intelligence was assessed using the Wechsler Adult Intelligence Scale (3rd version) at a mean age of 30.2 years. Educational attainment was defined as the highest grade completed successfully. Participants were also asked to report their income in the previous month. Confounding variables for this analysis included: monthly family income around the time of birth, maternal education, indicators of maternal and pregnancy health, gestational age, type of delivery, birth weight. During the 1984 and 1986 interviews, additional information was collected including paternal education, and household asset index.

Results and Conclusions:

Of the 5914 enrolled newborns, 3701 were interviewed in 2012/2013. Including the 325 individuals who had died, this represents a follow up rate of 68%. The interviewed participants were slightly more likely to be female and belong to intermediate socioeconomic categories compared with the original cohort, although these differences were small. One in every 5 women breastfed for less than 1 month, and one in six breastfed for a year or more. Only 12% of women breastfed predominantly more than 4 months.

At 30 years of age, the mean IQ was 98.0 ± 12.6 points and participants completed an average of 11.4 ± 4.1 years of schooling. In the unadjusted analyses, the outcome variables of interest increased with breastfeeding duration up to 12 months, and with predominant breastfeeding duration up to 4 months. After adjustment for confounders, the dose-response pattern for IQ and educational attainment increased monotonically. Income of the longest-duration breastfeeding group was slightly less, although not significantly, than in the second highest category. For total breastfeeding the adjusted difference was 3.8 (95% CI 2.2 – 5.3) IQ points, 0.9 (95% CI 0.4 – 1.4) years of education, and 341 (95% CI 93.8 – 588.3) Brazilian reais (R\$) in income, the latter is an equivalent of approximately 110 US\$. The mediation analyses suggested that the IQ was responsible for 72% of the effect on income.

The magnitude of these effects was important in public health terms. The difference in IQ between the most extreme groups was nearly four points, or an equivalent of about a third of a standard deviation. The increase in education of 0.9 years was roughly a quarter of a standard deviation, and the difference in income of R\$341 corresponded to about a third of average income.

Program and Policy Implications:

The long-term follow up of a birth cohort in Brazil found that breastfeeding is associated with improved performance in intelligence tests at 30 years of age, which may contribute to an increase in years of schooling and income in adulthood (4). The authors state that the high follow up rate, the absence of differential follow up with respect to breastfeeding duration, and the relatively similar follow-up rates for many baseline characteristics suggest that the present results were unlikely caused by selection bias.

NNA Editor's Comments*:

The short- and long-term benefits of breastfeeding have been well established, including the beneficial impact on IQ from several studies. However, it was uncertain whether an increased IQ would have any real consequences on people's lives. The present study found that the impact of breastfeeding on IQ may indeed be related to the number of years in education and monthly income and thus strengthens the argument for the importance of breastfeeding promotion even further.

*These comments have been added by the editorial team and are not part of the cited publication.

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Editorial Office:

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