



## Breastfeeding and Child Psychosocial Development

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### **Topic**

*Breastfeeding*

### **Introduction**

The effects of breastfeeding on children's development have important implications for both public-health policies and for the design of targeted early intervention strategies to improve the developmental outcomes of children at risk as a result of biological (e.g. prematurity) or social adversity (e.g. poverty). To date, research has provided clear support for the nutritional and health benefits of breastfeeding,<sup>1</sup> with appropriate cautions noted for women who are ill or on medication. There is also evidence of small but consistently positive effects of breastfeeding on intellectual development.<sup>2,3</sup> Less well studied is the relationship between breastfeeding and child psychosocial development.

### **Subject**

Most research concerned with the psychosocial effects of breastfeeding has focused on the following:

- a) Comparisons between breast- and bottle-feeding mother-infant dyads on a range of maternal and infant measures, such as maternal stress, well-being, parenting behaviour, the quality of early mother-infant interactions and infant self-regulation and behaviour.
- b) Examining within-group differences in maternal mood and infant state both before and after breast- or bottle-feeding.
- c) Examining linkages between the extent of breastfeeding and children's longer-term psychosocial outcomes, including attachment to parents, behavioural adjustment and mental health.
- d) Adjusting these linkages for confounding factors correlated with both the decision to breastfeed and child outcomes.

### **Problems**

The key problems in this area of investigation are as follows:

- a) Separating the effects of breastfeeding from other potentially confounding factors associated with breastfeeding. Breastfeeding as a choice of infant feeding has been

shown to be related to socioeconomic status (SES), maternal mental health, education and nurturance. These factors are also related to child development outcomes. Therefore, determining the unique effects of breastfeeding on child psychosocial outcomes has been difficult and not always well done.

b) Nutrition and health factors such as alcohol use and medication can reduce the quality of mothers' breast milk and adversely affect infant neurological state and mother-infant interactions. Therefore, controlling for breast milk quality is also important. Few studies have included such measures or controls.

c) Relatively little consideration has been given to the effects of breastfeeding duration or the use of combined feeding methods on later psychosocial outcomes.

d) Considerable variability exists in the psychosocial outcomes studied and the length of developmental follow-up, with few studies extending beyond the first years of life.

e) Finally and importantly, the mechanisms or pathways by which breastfeeding may influence children's short- and long-term psychosocial adjustment have not been identified.

### **Research Context**

Research in this area has been based predominantly on samples of mothers and infants living in developed countries. Research designs have included both cross-sectional and longitudinal approaches. Cross-sectional studies have used both retrospective and concurrent reports of maternal breastfeeding. With a few exceptions, longitudinal studies have tended to be of short duration. In both longitudinal and cross-sectional studies, outcome measures have included maternal interviews or reports, child interviews, and direct observations of feeding, play and other interactions between mothers and their infants. Experimental investigations in this area have not been able to randomly assign mother-infant dyads to different feeding groups, making other methodological and analytical steps necessary to ensure that research outcomes are accurately attributed to the factors under study.

### **Key Research Questions**

The key research questions in this area are as follows:

- a) Does breastfeeding contribute to children's psychosocial adjustment both in the short and long term? Psychosocial outcomes of interest include the formation of a secure and close infant-mother attachment relationship, and child social and behavioural adjustment.
- b) What are the mechanisms and pathways by which breastfeeding might influence child psychosocial outcomes?

### **Recent Research Results**

Evidence suggests that a range of factors are associated with both the decision to breastfeed and the duration of breastfeeding. Specifically, women who choose not to breastfeed and who breastfeed for a shorter length of time tend to be younger, less well educated, sole parents, poorer, and to report lower levels of parental nurturance.<sup>4-6</sup> In addition, women who do not breastfeed are more likely to have smoked during their pregnancy, to have infants of lower birth weight, and to be primiparous (i.e. having their

first child).<sup>4</sup> Finally, several studies also show that mothers who are employed or anticipate returning to full-time employment are less likely to breastfeed, and when they do, will tend to feed their babies for a shorter length of time.<sup>7,8</sup>

These findings clearly indicate that infant breastfeeding is a selective process, whereby those infants who have been exposed to greater perinatal risk and who come from more disadvantaged social and family backgrounds are less likely to be breastfed. It is, therefore, important that these pre-existing differences be considered by researchers when examining associations between breastfeeding and child psychosocial outcomes. Although most studies reviewed have attempted to control statistically for some of these differences, very few have controlled extensively for a range of these confounding factors.<sup>4</sup>

Findings from short-term outcome studies suggest that breastfeeding may have some benefits for both mother and infant, as well as for their developing relationship. Specifically, mothers who breastfeed have been found to report lower levels of perceived stress and negative mood, higher levels of maternal attachment, and tend to perceive their infants as more reinforcing than mothers who formula-feed.<sup>5,9</sup> There is evidence to suggest that breastfeeding mothers may hold their babies for longer and feel more confident as parents.<sup>10</sup> After breastfeeding, mothers also report reductions in negative mood compared to mood levels prior to breastfeeding.<sup>5</sup>

In terms of infant behaviour, there is some suggestion that in the first few weeks of life breastfed babies may be characterized by improved alertness<sup>11,12</sup> and other aspects of neurobehavioural functioning.<sup>13</sup> For example, Hart et al.<sup>13</sup> found that one-week-old breastfed infants obtained significantly higher scores on the orientation and motor scales on the Brazelton Neonatal Behavioural Assessment Scale.<sup>14</sup> In addition, they also tended to have better self-regulation, fewer abnormal reflexes and fewer signs of withdrawal than formula-fed infants. Additional support for the possible self-regulatory benefits associated with breastfeeding is also provided by a short-term follow-up study of 158 infants.<sup>10</sup> This study found that between the ages of 13 and 52 weeks, breastfed babies consistently cried for shorter periods of time than formula-fed babies.

Only a small number of studies have examined the effects of breastfeeding on the development of the mother-infant relationship.<sup>9,10</sup> One study has shown that although breast- and formula-feeding mothers spend similar amounts of time involved in care-taking activities with their infant, breastfeeding mother-infant dyads spent more time engaged in playful and positive interactions than formula-feeding dyads, with this time difference increasing from 3.2 hours per month at six weeks to 19.4 hours per month at 13 weeks. Importantly, this difference persisted after statistical control for the effects of maternal employment and socioeconomic status. A similar, but less well controlled study by Else-Quest et al.<sup>9</sup> also suggests some linkages between breastfeeding and improved mother and infant psychosocial functioning. They compared two groups of mothers and infants at ages four and 12 months: those who breastfed their infants during the first week and those who did not. At four months, mothers in the breastfeeding group reported higher levels of attachment to their infant and increased infant reinforcement. However,

these differences were no longer evident at 12 months. At the 12-month assessment, breastfeeding mothers reported lower levels of negative mood, behaved less intrusively with their infants, and their infants obtained lower scores on a measure of dysregulation (anxiety, self-regulation, frequency of mood changes and organization). The authors concluded that although breastfeeding was associated with some relationship and infant advantages, formula-fed dyads did not have poor quality relationships. The findings from this study are limited by a lack of control for confounding factors and also by the fact that by four months, 50% of the breastfeeding mothers had weaned their babies. Finally, a study of 915 infants found that both exclusively and non-exclusively breastfed infants obtained higher scores on the social personal subscale of the Griffith Scales of Mental Development at 18 months.<sup>15</sup>

There are even fewer studies examining the longer-term psychosocial effects of breastfeeding. At present, findings are mixed, with some studies suggesting some limited psychosocial benefits<sup>4,16</sup> and others not.<sup>17</sup> No clear evidence has emerged to suggest that breastfed babies are at lower risk of developing behaviour or mental health problems in later life.<sup>4,17,18</sup> However, one study has shown a small but significant association between breastfeeding duration and adolescents' perceptions of maternal care, with a longer duration of breastfeeding being associated with increased adolescent perceptions of maternal nurturance. This association persisted after statistical control for a wide range of the selection factors noted above.

### **Conclusion**

Evidence to support a link between breastfeeding and positive psychosocial outcomes for children is at best modest, and in many cases has been limited by inadequate control for pre-existing differences between breast- and formula-fed infants and their families. Nonetheless, there is some suggestion that breastfed infants may be more alert, cry less, and be better able to engage in interactions with their parents than formula-fed infants. Breastfeeding may also have some stress-reducing properties for mothers and assist parenting confidence. Finally, one well-controlled long-term follow-up study has shown small to modest increases in perceived maternal care among adolescents who were breastfed for longer durations. The mechanisms by which these associations arise have not been empirically established. Attachment fostered through breastfeeding is one possible and frequently cited mechanism. Another explanation could be that associations between breastfeeding and improved mother-child relations may, at least in part, reflect improvements in child cognitive functioning associated with breastfeeding.

### **Implications for Policy and Services**

- There is no substantive evidence to promote breastfeeding on the grounds that it leads to better psychosocial development. However, there is ample justification for the value of breastfeeding from studies of the nutritional and cognitive advantages associated with breastfeeding. This needs to be taken into consideration when preparing breastfeeding promotional materials.
- Although future research may establish whether breastfeeding leads to improved psychosocial functioning, a large number of parent and family factors have been shown to be more strongly linked with child psychosocial maladjustment. These

include teenage motherhood, maternal educational under-achievement, poverty, parental antisocial behaviour and other mental-health problems, family violence, child abuse and parenting difficulties. Therefore, in order to reduce rates of behavioural and mental health problems among children and youth, broadly-based community and family intervention strategies are likely be the most effective approaches.

**To learn more on this topic, consult the following sections of the Encyclopedia:**

- [How important is it?](#)
- [What do we know?](#)
- [What can be done?](#)
- [According to experts](#)
- [Key messages](#)

**REFERENCES**

1. Meyers A, Chawla N. Nutrition and social, emotional and cognitive development of infants and young children. *Zero to Three* 2000;21(1):5-12.
2. Horwood LJ, Fergusson DM. Breastfeeding and later cognitive and academic outcomes. *Pediatrics* 1998;101(1):1-7. Available at: <http://pediatrics.aappublications.org/cgi/content/full/101/1/e9>. Accessed April 27, 2005.
3. Anderson JW, Johnstone BM, Remley DT. Breast-feeding and cognitive development: a meta-analysis. *American Journal of Clinical Nutrition* 1999;70(4):525-535.
4. Fergusson DM, Woodward LJ. Breast feeding and later psychosocial adjustment. *Paediatric and Perinatal Epidemiology* 1999;13(2):144-157.
5. Mezzacappa ES, Katkin ES. Breast-feeding is associated with reduced perceived stress and negative mood in mothers. *Health Psychology* 2002;21(2):187-193.
6. Dubois L, Girard M. Social inequalities in infant feeding during the first year of life. The Longitudinal Study of Child Development in Quebec (LSCDQ 1998-2002). *Public Health Nutrition* 2003;6(8):773-783.
7. Fein SB, Roe B. The effect of work status on initiation and duration of breast-feeding. *American Journal of Public Health* 1998;88(7):1042-1046.
8. Earland J, Ibrahim SO, Harpin VA. Maternal employment: does it influence feeding practices during infancy? *Journal of Human Nutrition and Dietetics* 1997;10(5):305-311.
9. Else-Quest NM, Hyde JS, Clark R. Breastfeeding, bonding, and the mother-infant relationship. *Merrill Palmer Quarterly* 2003;49(4):495-517.

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10. Baidam EM, Hillier VF, Menon S, Bannister RP, Bamford FN, Moore WMO, Ward BS. Attention to infants in the first year. *Child: Care, Health and Development* 2000;26(3):199-215.
11. Feldman R, Eidelman AI. Direct and indirect effects of breast milk on the neurobehavioral and cognitive development of premature infants. *Developmental Psychobiology* 2003;43(2):109-119.
12. Gerrish CJ, Mennella JA. Short-term influence of breastfeeding on the infants' interaction with the environment. *Developmental Psychobiology* 2000;36(1):40-48.
13. Hart S, Boylan LM, Carroll S, Musick YA, Lampe, RM. Brief report: Breast-fed one-week-olds demonstrate superior neurobehavioral organization. *Journal of Pediatric Psychology* 2003;28(8):529-533.
14. Brazelton TB, Nugent JK. *Neonatal behavioral assessment scale*. 3<sup>rd</sup> ed. London, England: Mac Keith Press; 1995.
15. Little RE, Northstone K, Golding J, ALSDAC Study Team. Alcohol, breastfeeding, and development at 18 months. *Pediatrics* 2002;109(5):1-6. Available at: <http://pediatrics.aappublications.org/cgi/content/full/109/5/e72>. Accessed April 27, 2005.
16. Taylor B, Wadsworth J. Breast feeding and child development at five years. *Developmental Medicine and Child Neurology* 1984;26(1):73-80.
17. Fergusson DM, Horwood LJ, Shannon FT. Breast feeding and subsequent social adjustment in six- to eight-year-old children. *Journal of Child Psychology and Psychiatry and Allied Disciplines* 1987;28(3):379-386.
18. Golding J, Rogers IS, Emmett PM. Association between breast feeding, child development and behaviour. *Early Human Development* 1997;49(Suppl S):S175-S184.

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