



Feeding Skill, Appetite and Feeding Behaviours of Infants and Young Children and Their Impact on Growth and Psychosocial Development

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(Published online December 22, 2004)

Topic

Eating behaviour

Introduction

Feeding, like other sensorimotor skills, is a developmental skill that matures during the first two years of life. It is a highly complex sensorimotor process with developmental stages based on neurological maturation and experiential learning.¹⁻⁴ However, feeding, unlike other sensorimotor skills, is heavily reliant on internal incentive or motivation to initiate ingestion (hunger cry) from birth on,⁵ and is essential for survival of the newborn. Thus, the act of feeding is highly charged emotionally for the mother, whose primary responsibility, as viewed by the family, society and culture around her, is to ensure the early growth and well-being of her child. Therefore, from the very beginning the maternal-infant feeding relationship is influenced by physiologic as well as interactional forces at multiple levels.

Subject

When feeding skills are intact and appetite is robust, feeding times, and later on, mealtimes are a source of pleasant socialization resulting in adequate nutrient intake and good growth.⁶ Demanding food at regular intervals, sucking, eating and drinking with good rhythm, trying new food tastes or textures, and expressing satisfaction at the end of feeding are all considered good feeding behaviours by family and society. These pro-feeding behaviours invite praise and positive feeding interactions and thus reinforce the feeling of self-mastery in the young child and promote continued food acceptance and independent feeding behaviours.

However, when feeding skills are impaired (e.g. poor sucking ability or hypergag reflex) and/or appetite is poor (inadequate hunger/satiety cues),⁷⁻¹³ they manifest themselves in problematic feeding behaviours such as not signalling hunger, sucking or eating excessively slowly, gagging, arching and head shaking at the sight of food and not bringing food to the mouth. In addition, associative conditioning to gastrointestinal cues (both hedonic and painful) is particularly powerful in young infants and this conditioning may also manifest in problematic feeding behaviours.¹⁴⁻¹⁸ Temperamental characteristics and regulatory capacities of the infant may further modulate these feeding

behaviours.^{19,20} Maternal attempts at increasing her infant's nutrient intake by feeding more frequently or longer duration tend to result in stressful feeding experiences for both.²¹ While these efforts may work well initially for maintaining good weight gain,^{22,23} they tend to become ineffective after a while and maladjusted mealtime interactions and behavioural mismanagement prevail. Maternal and family characteristics and societal expectations about the size of the young child and the type of food eaten further influence an already stressful feeding relationship.^{17,24-26}

Problems

Feeding difficulties are one of the most common developmental disturbances in otherwise healthy infants and young children, often resulting in poor growth and failure to thrive. An estimated 25% to 28% of infants less than six months of age, 24% of two-year-old and 18% of four-year-old children are reported by their parents to have feeding problems.²⁷⁻³¹ At the clinical level, often neither the mother nor her pediatrician may be aware of the underlying reasons for problematic feeding behaviours. Thus, the mother's reactions to a poor feeder may be exposed to covert or overt family criticism, which often lead to internal doubt about her own ability to nurture.³²⁻³⁴ At the policy level, the lack of education of professionals and young parents about feeding as a highly variable developmental skill, motivated by hunger/satiety cycles and conditioned to parental reactions, may result in poor growth, problematic feeding behaviours, stressed mealtime interactions and family conflicts.

Research Context

Mostly cross-sectional clinical studies have been employed to examine the relationship between feeding difficulties and attachment,^{35,36} maternal characteristics,³⁷⁻³⁹ family dynamics⁴⁰⁻⁴² and feeding practices.^{22,43,44} These cross-sectional studies were conducted retrospectively, that is, after the children were diagnosed with poor growth, and were correlative in nature, making causal interpretation difficult. Very few observational studies focused on feeding interactions and problematic feeding behaviours.^{45,46} Other studies were conducted in the context of behavioural intervention for problematic feeding behaviours in medically ill infants.⁴⁷⁻⁵⁰ Only a handful of developmental psychologists have been interested in the development of feeding and patterns of food acceptance.⁵¹⁻⁵³ More recently, an increasing number of researchers have started to focus on possible pathophysiology (heart rate variability, hormonal balance) of poor growth and problematic feeding behaviours.^{54, 55}

Key Research Questions

The extensive research in the area of feeding problems and poor growth can be divided along the following three research questions: 1) How do maternal (family) characteristics (cognitive abilities, personality disorders, psychological status and early attachment history) influence feeding behaviours and growth? 2) How effective are behavioural interventions for severe problematic feeding behaviours in medically ill infants? (See Kerwin's review of this large body of literature⁵⁶) and 3) How do infant characteristics (feeding skills, appetite, temperament and other physiological characteristics) trigger or influence feeding behaviours, mealtime interactions and growth?

Recent Research Results

Only research addressing question three will be summarized here. In a recent large whole-population survey of children's growth and development, a significant portion (n=17) of 47 children identified with failure to thrive at one year of age were found to have oral motor difficulties. The authors suggested that some children were biologically more vulnerable to poor eating from birth.⁵⁷ Another study showed that young infants with gastroesophageal reflux were significantly more likely to have delay in their feeding skills and readiness behaviour for solids than controls.⁵⁸ In a prospective study of a group of healthy term infants (n=330), infants with measured inefficient sucking at one week and two months were significantly more likely to have mothers with greater efforts at feeding than infants with efficient sucking.²³

A number of studies have shown that children under three to four years of age eat primarily in response to appetite or hunger cues, whereas older children's eating is influenced by a variety of environmental (extra food available) and social factors.⁵⁹⁻⁶² A group of studies demonstrated that children with failure to thrive at age one seem to respond equally well to hedonic cues (sugar solution) as controls.⁶³ In another study, the high-energy food intake was significantly lower for a group of one-year-olds with failure to thrive than for controls. Also, the children with failure to thrive did not compensate at their subsequent meal for their previous high-energy intake, as did controls. These authors concluded that children with failure to thrive lacked the normal responses to internal hunger/satiation cues.⁶⁴ As well, children with poor growth were observed to refuse offered food more often and fed themselves significantly less often than controls.⁶⁵ Other work has shown that feeding problems often co-occur with sleeping and behavioural disturbances (irritability, poor self-calming and intolerance to change), suggesting that perhaps all these are symptoms of a common underlying constitutional "regulatory disorder" in infants and young children.⁶⁶⁻⁶⁹

Lastly, after 60 years of animal studies focusing on appetitive behaviours at the hormonal level, studies of infant feeding behaviours and appetite enhancing medications began to appear. Several studies showed that appetitive or pro-feeding behaviours increase in response to appetite stimulating medications, resulting in weight gain.⁷⁰⁻⁷³

Conclusions

Understanding feeding behaviours requires the knowledge of feeding as a developmental skill that matures over time and is reliant on hunger/satiety cues and on experiential learning. Whereas feeding skills are well established by two years of age, hunger/satiety cues shift from primarily internal to external (family, school and societal) control by about four to five years. Thus, although initially problematic feeding behaviours (e.g. turning head, arching or crying) tend to be reactions to internal cues (absence of hunger, poor sucking ability), these same feeding behaviours may also become conditioned by association to external and societal cues (coaxing parents, television commercials).

Early behavioural intervention can play an important role in normalizing feeding behaviours and mealtime interactions, which in turn help promote independence and other self-help skills in the child. However, cultural practices of feeding and other self-

help skills of young children differ widely. In particular, young immigrant parents have little knowledge of French or English and often feel isolated in their new country. In the absence of their own families, they lack information and support. During therapeutic intervention, their cultural issues need to be addressed with sensitivity and care.

Implications for Policy and Services

The major finding from the research summarized is that the physiological make-up of the infant plays an important role in the dynamic relationship in which feeding behaviours develop. This finding has several implications for policy and services in the area of feeding behaviour and growth.

1. The development of educational guidelines for teaching professionals, clinical practitioners and parents about feeding as a developmental skill, and feeding behaviours as markers of feeding skills and hunger/satiety cycle, as well as reactions to parental feeding practices, should be required.
2. Further research regarding physiological and environmental factors of problematic feeding behaviours would be desirable.
3. The creation of multidisciplinary feeding clinics with the mandate of addressing more severe feeding difficulties should be encouraged. These feeding clinics need to be easily accessible to parents, where effective behavioural intervention and preventive strategies may be implemented in the early stages of reported difficult feeding behaviours.
4. The training of experts in the field of feeding disorders, which should include training in the behavioural, developmental and interactional components of feeding behaviours, needs support.
5. The development of an easy screening instrument for problematic feeding behaviours to be used in pediatricians' offices should be promoted. Such an instrument would aid in earlier identification and effective intervention for children with problematic feeding behaviours and their families.

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To cite this document:

Ramsay M. Feeding skill, appetite and feeding behaviours of infants and young children and their impact on growth and psychosocial development. In: Tremblay RE, Barr RG, Peters RDeV, eds. *Encyclopedia on Early Childhood Development* [online]. Montreal, Quebec: Centre of Excellence for Early Childhood Development; 2004:1-9. Available at: <http://www.child-encyclopedia.com/documents/RamsayANGxp.pdf>. Accessed [insert date].

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