JOGNN

IN FOCUS

The Mother-Infant Feeding Tool

Lisa F. Brown, Suzanne Thoyre, Karen Pridham, and Christine Schubert

Correspondence
Lisa F. Brown, PhD, RN, School of Nursing, Virginia Commonwealth University, P.O. Box 980567, Richmond, VA 23298.
lfbrown2@vcu.edu

Keywords
preterm infant feeding
mother-infant interaction
preterm infants

ABSTRACT

Objective: To describe the development and evaluation of an observation system to assess the process of mother-infant feeding interaction relevant to infant neuro-behavioral regulation: the Mother-Infant Feeding Tool.

Design: Secondary analysis.

Setting: Special care nursery just before discharge and in the home at 1 and 4 months postterm age.

Participants: Forty-three mother-infant dyads.

Methods: Videotaped feeding interactions were examined to assess regulatory processes of mother-infant interaction. Data were collected at three times over the infant's first 4 postterm months: before the infant's discharge from the special care nursery and at 1 and 4 months postterm age in the home.

Results: Across all three data points mothers rarely talked to their infants.

Conclusion: Further testing is needed, but the Mother-Infant Feeding Tool shows promise in assessing very early mother-infant feeding interactions.

JOGNN, 38, 491-503; 2009. DOI: 10.1111/j.1552-6909.2009.01047.x

Accepted September 2008

Lisa F. Brown, PhD, RN, is an assistant professor in the School of Nursing, Virginia Commonwealth University, Richmond, VA.

Suzanne Thoyre, PhD, RN, is an associate professor in the School of Nursing, University of North Carolina, Chapel Hill, NC.

Karen Pridham, PhD, RN, is a professor emeritus from the School of Nursing, University of Wisconsin-Madison, Madison, WI.

Christine Schubert, PhD, is an assistant professor in the School of Medicine, Virginia Commonwealth University, Richmond, VA.

Early maternal and infant-feeding behaviors are important because of their frequency and their regulatory effects on nutrient intake and infant development (Anand & Scalzo, 2000; DeWitt et al., 1997; Valenzuela, 1997). These regulatory effects are derived from infant physiological, neuromotor, behavioral, attentional, and emotional responses to maternal behavior. Interactive feeding behaviors are particularly important for mothers of premature infants because of the infants' needs for feeding support. Early feeding interactions may strengthen adaptive feeding behaviors or reinforce maladaptive feeding behaviors of both the mother and the infant. Adaptive maternal feeding behavior is positive in affect and is sensitive and responsive to the infant's signals of need for protection, nurturance, and comfort (DeWitt et al.).

A mother who is sensitive recognizes her infant's cues and responds accordingly. Adaptive infant feeding behavior is organized and regulated in a manner that supports participation in the feeding within the limits of developmental capacities. Over time, patterns of mother-infant feeding interaction may modify the development of the premature infant's brain pathways associated with social, cognitive, emotional, and behavioral participation in the goal-directed activity of feeding (Als et al., 2004; Anand & Scalzo, 2000). Little is known about the very early feeding interactions of mothers and their preterm infants' that occur during the first quarter of the first postterm year.

Neural pathways of the brain involved in emotional and social function begin to develop in the first months of life (Champagne & Curley, 2005; Schore, 2001). A substantial amount of brain maturation occurs during infancy. The repeated interactions that an infant experiences during feeding are incorporated into and shape neural development. The neural pathways that develop are central to regulation of physiological, arousal, and motoric processes and conditions as well as behavioral adaptations during feeding. Examples of behavioral adaptations include sucking, swallowing, and breathing in a coordinated manner. Mothers of prematurely born infants will have a more challenging job of supporting their infants when they begin to nipple feed than mothers of full-term infants, given the younger infants' neurodevelopmental limitations in sucking, swallowing, and breathing. Not all premature infants will have coordination at the time they begin nipple feeding. The neuro-behavioral development that occurs is the basis of the infant's long-lasting regulatory strategies (Anand & Scalzo, 2000).

Little is known about feeding interactions that begin before prematurely born infants are term age and continue through the early months.

It is important to study the process involved in the very early feeding interaction of mothers and their prematurely born infants because of its effect on neuro-behavioral development. A process is a series of actions, changes, or functions bringing about a result, such as feeding. However, little is known about feeding interactions that begin before prematurely born infants are yet term age and continue through the early months of the first postterm year. Available instruments to assess very early feeding interactions are lacking in features to assess the regulatory process of mothers and infants. The purpose of this article is to describe the development and evaluation of an observation system to assess the process of mother-infant feeding interaction relevant to infant neuro-behavioral regulation.

Feeding is considered the most complex and highly organized behavior of very young infants (Osofsky, 1976). Studying the regulatory processes of mother-infant feeding interactions will help clinicians and researchers gain a better understanding of the structure of feeding interactions. A description of the process involved in mother-infant feeding interactions will inform the observer about interactive behavior of the mother in the context of the infant's behavior and vice versa and provide a basis for elucidating the effect of the behavior of one member of the dyad on the other. Once researchers and clinicians understand the process, interventions can be developed to aid the dyad in becoming more adaptive in their feeding behavior.

Adaptive feeding behaviors for the mother are sensitive to the infant's signals, responsive to needs, and supportive of the regulatory process. An extensive body of research has examined mother-infant interactive behavior (Coyl, Roggman, & Newland, 2002; Davis, Edwards, & Mohay, 2003; Feldman & Eidelman, 2006; Forcada-Guex, Pierrehumbert, Borghini, Moessinger, & Muller-Nix, 2006; Harel, Oppenheim, & Tirosh, 1999; Holditch-Davis, Cox, Miles & Belyea, 2003; Holditch-Davis, Miles, & Belyea, 2000). However, these studies have not focused on the regulatory aspects of the adaptive or maladaptive qualities of mother-infant interactive behavior during feeding. To date, instruments to assess the process of regulation during feeding for premature infants and their mothers are lacking.

Regulatory Aspects of Mother-Infant Interaction

The synactive theory of development (Als, 1982; Als et al., 2004) and attachment theory (Bowlby, 1988) provided the theoretical underpinnings for an observational tool to describe prematurely born infants interacting with their mothers during feeding. According to Als and Gilkerson (1995), infant behavior is a function of four subsystems. The subsystems include the autonomic, motor, behavioral, and attentional systems. The synactive theory suggests that mothers of preterm infants assist their infants to meet regulatory goals by providing sensitive and responsive care. This care is contingent upon the infant's physiological and motor stability as well as attentional and behavioral adaptations to the feeding.

Bowlby (1982) postulated that throughout infancy, the infant must have a close relationship with a warm, nurturing, consistent caregiver to ensure protection in the face of both internal changes and external challenges. The mother helps protect the infant's airway during feeding and provides comfort by aiding the infant in maintaining regulated behavioral, emotional, and physiological processes. Research has shown that maternal sensitivity to infant signals and timely and appropriate responsiveness to the infant's signals, pacing, and preferences are associated with positive infant developmental outcomes (Ainsworth, 1983; Egeland & Farber, 1984; Isabella, 1993; Mertesacker, Bade, Haverkock, & Pauli-Pott, 2004). Maternal sensitive and responsive behaviors during feeding are important for infant feeding outcomes (DeWitt et al., 1997; Pridham, Brown, Clark, Sondel, & Green, 2002; Thoyre & Brown, 2004; Valenzuela, 1997). Infant regulated feeding behaviors have been found to depend on the mother's ability to modify the environment when needed and to directly support the infant's feeding (Brown & Pridham, 2007). Infant behaviors regulate those of the mother and the mother's caregiving behaviors in turn regulate those of the infant (Barnard, Bee, & Hammond, 1984; Osofsky & O'Connell, 1972).

Premature infants' immature regulatory systems make it difficult to process stimulation, and their cues for support in regulating input may not be clear to their mothers (Barnard et al., 1984; Davis et al., 2003; Singer et al., 2003; Thoyre & Carlson, 2003a). Consequently, premature infants have been found to be less attentive, less expressive, and fussier than term infants (Davis et al.; Wolf et al., 2002). As a result of immaturity, these infants