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The Development of a Mother's Internal Working Model of Feeding

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Abstract

Purpose—The purpose of the study was to describe changes in a mother's early internal working model (IWM) of infant feeding.

Design & Methods—In this qualitative study, 12 maternal responses to the semi-structured IWM interview were audio-recorded; once in the neonatal intensive care unit (NICU) after infants began oral feeding and once 2 weeks post-discharge. Interviews were analyzed using directed content analysis.

Results—A change between mothers' early and later nipple feeding experiences was identified.

Practice Implications—Nurses and other clinicians can help mothers understand the infant's behaviors and focus on the infant's nutritional intake while simultaneously developing a relationship with the infant.

Search terms

Infant feeding; infant, premature; models. psychological; models, theoretical; mother-infant relations; qualitative research

Introduction

One of the final criteria of discharge for a premature infant is the ability to orally feed. In order to achieve oral feeding ability, the preterm infant has to demonstrate sucking, swallowing, and breathing coordination. The mother, who generally is the infant's primary caregiver, also needs to be able to read the infant's feeding cues and guide the feeding. While the infant is developing coordination, the mother is learning how to read the infant's cues and make feeding decisions based on those cues. The infant's cues acquire their meaning in light of the mother's internal working model (IWM) of feeding. The IWM is a

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mental model composed of cognitions (perceptions, judgments), emotions, and intentions for action that operates dynamically to guide maternal feeding decisions (Pridham, Schroeder, Brown, & Clark, 2001). This decision-making may concern selecting among goals, devising a plan of action, and using infant behavior as feedback to determine how well the plan is working. For a mother, the infant's feeding may achieve a variety of goals, including provision of nutrition, support of growth and development, and bonding with the infant. Mothers may expect a feeding that is compatible or incompatible with their goals for the infant's nutritional intake, social interaction, or both. They may expect an infant who is hungry and willing to eat or an infant who needs prodding to consume what the clinicians have determined to be an adequate intake.

Mothers' feeding decisions may vary despite maintaining the same goal. For example, one criterion for discharge from the NICU is that the infant must get adequate nutritional intake without the use of a gavage tube. A mother who expects her infant to orally consume the contents of a 2-ounce bottle may structure the feeding by prodding and sometimes coercing the infant until the goal is achieved and a gavage feeding was avoided. Another mother may respond dynamically to the cues of the infant and end the feeding before the prescribed intake is reached and allow the rest of the feeding to be gavage fed. Although both mothers expected their infants to have adequate nutritional intake, the first mother had a competing goal that can be physiologically costly to the infant, whereas the second mother intended to follow her infant's behavioral cues of satiety to decide when to conclude the feeding.

The concept of the IWM contributed by Bowlby (1982) aids understanding of the difference in mothers' decisions for action despite having the same motivation and goal for feeding. This concept, in addition to specifying the motivation that is activated and its goal, includes expectations, intentions, and emotion that shape the decisions and choices a mother makes about feeding her infant. Identifying a mother's decisions about infant feeding, therefore, may be an approach to understanding a mother's IWM of infant feeding. Knowledge of mothers' IWMs of infant feeding may support clinicians in determining the risks of mothers' under- or over-feeding their infants. By understanding mothers' IWMs for infant feeding, clinicians can develop and promote interventions that will support development of healthy feeding behavior that can extend beyond infancy.

Little is known about the decision-making of mothers of premature infants at the beginning of their feeding experiences with their infants, and their IWMs of feeding. The purpose of this paper is to describe the changes in mothers' IWM of feeding from the time they begin to nipple feed their infants in the Neonatal Intensive Care Unit (NICU) and 2 weeks after they have been responsible for feeding their infants at home. The decisions that mothers made were a vehicle for learning about their goals for feeding and their expectations of their infants' feeding behavior. Mothers' decisions regarding infant feeding and how they develop or change over time is of particular interest to clinicians' practice of preventive and health promotional care.

Background

Internal Working Models

An IWM is a mental model of expectations and goals that is derived from experience and anticipation that operates in relation to events to regulate goal-directed thoughts and actions. An IWM of feeding organizes, orients, and energizes a mother's thoughts, emotions, and actions and operates through processes of interpreting and evaluating information and forming plans of action (Bowlby, 1982). It is constructed and reconstructed through experiences and is influenced by relationships with others and interactions, including the guidance of and relationships with others (Pridham, Schroeder, & Brown, 1999; Pridham et

al., 2001). An IWM of feeding is a metaphor for a mother's feeding goals, actions, and intended behavioral responses and includes her motivation, expectations, intentions, evaluations, meanings, emotions, and strategies used while feeding her infant (Pridham et al., 1999). Evidence of a mother's IWM in operation is revealed in the kind of decisions she makes, her justification for her decisions, and the actions she takes in light of her decisions.

During a feeding interaction, a mother's IWM operates in filtering and assessing her infant's behavior, imparting meaning to it and helping her make feeding decisions. For example, a mother who sees her infant as greedy may interpret the infant's gulping as a hunger cue and continue feeding. In contrast, a mother who views her infant as a new feeder, who is getting too much formula, paces the feeding or changes the nipple to help decrease the flow of formula. In this way a mother's IWM of feeding functions as a kind of internal guidance system. An IWM filters out previous task-related and social-emotional aspects of experience that are relevant to the current situation. Theoretically, a mother's IWM of feeding can be modified as a consequence of her capacities to interpret and reflect on previous and current experiences.

Researchers have found changes in a mother's IWM over time. Pridham, Saxe, and Limbo (2004) presented three case studies to examine feeding issues for mothers of very low-birth-weight premature infants. Assessment began when the infants were 1-month postmenstrual age (PMA) and ended at 12-months PMA. These researchers found that feeding motivations, goals, expectations, and intentions were functions of personal and social circumstances and change over time. They also found that IWM components of motivations, feelings, goals, expectations, intentions, and strategies were identified as a mother told her story: how things were going for her and her baby, what she wanted and expected to happen, what she intended to do and what she did, and what made things difficult or easy (Pridham et al., 2004).

Researchers have also found significant changes in working model adaptiveness during the infant's first year (Pridham et al., 1999). Adaptiveness refers to a mother's sensitivity to her infant's needs and preferences and to her appropriate, creative, mature responsiveness to her infant. A measure of working model adaptiveness was rated on a 6-point ordinal scale. A score of 1 represented maternal expectations and intentions that were not adaptive and a score of 6 represented highly adaptive expectations and intentions. The changes in the working model scores were not linear, indicating that adaptiveness did not necessarily increase as a mother gained experience with her infant. This finding indicates that a mother's adaptiveness score for one point in time could not be used as a measure of adaptiveness at other times (Pridham et al., 1999). It is possible that growth in a mother's IWM of feeding does not lend itself to be easily quantified. It may be better expressed qualitatively, at least in the initial stages of study, because it may vary depending on the infant's feeding condition.

When an infant is prematurely born, nurses and clinicians can spend a great deal of time working on the infant's feeding issues. What is not known is how a mother thinks about feeding her infant, what her goals for feeding are, and how those goals change over time. The IWM of feeding is a fairly recent concept, and few studies have examined it in prematurely born infants. In recent years Pridham and her colleagues have done most of the finished work on this concept. They have studied mothers and infants beginning at 1 month of age through the infant's first post-term year (Limbo & Pridham, 2007; Pridham, Knight, & Stephenson, 1989; Pridham et al., 2004; Pridham et al., 1999; Pridham et al., 2001; Schroeder & Pridham, 2006). No studies were found that assessed the development of a mother's IWM of feeding from the time feedings are initiated until 2 weeks post-discharge from the Neonatal Intensive Care Unit (NICU). These time points are important in

understanding how a mother's IWM of feeding develops from the time nipple feeding begins in the hospital until she has assumed full care of the infant at home because it is during this time mothers develop the foundation of their feeding philosophy. Understanding the features of the IWM of feeding that mothers have developed can assist clinicians in promoting mothers' sensitivity to their infants' cues of hunger and satiation and their appropriate response to their infants' attempts to regulate feeding. These are areas in which nurses can develop interventions and criteria for evaluating intervention outcomes. Therefore, the purpose of this study is to describe the change that occurs in a mother's IWM of feeding from the time feedings begin in the NICU until 2 weeks after hospital discharge.

Design and Method

In this descriptive qualitative study, mothers' narrative responses to the semi-structured IWM interview were analyzed. Mothers were interviewed twice, once in the NICU soon after their infant began nipple feeding and once either in the School of Nursing lab, outfitted as a nursery, or at the home of the mother 2 weeks after discharge from the NICU.

Participants

Fifteen mother-premature infant dyads were recruited from a large central city hospital. The mothers were English-speaking and 18 years old or older at the time of recruitment. Infants' mean age was 35 weeks (range 32–41 weeks) of age at the first interview and 38 weeks (range 36–44 weeks) postmenstrual age for the second interview. Infants were hospitalized for an average of 25 days (range 7–98 days). Breast and bottle-feeding mothers were recruited. Only three mothers were breastfeeding but no one was exclusively breastfeeding. Three mothers were lost to follow-up for the second interview because they moved, changed their telephone number, and/or the telephone numbers were disconnected.

Procedure

Institutional review board approval was obtained from the clinical/academic center for the study protocol and consent form prior to the initiation of this study. A clinical coordinator obtained permission from eligible mothers for the investigators to contact them. Signed, informed consent was obtained from all participants after a full discussion of the study's procedures.

The first data collection visit occurred in a private room in the NICU. The second data collection visit occurred 2 weeks after the participant's preterm infant was discharged from the NICU and occurred at a location determined to be convenient by each participant. Eleven participants chose to be interviewed at the lab nursery and one chose to be interviewed at home. Visits were scheduled around the infant's feeding time on a day that was convenient for the mother.

Mothers were video recorded feeding their infants. Upon completion of the feeding, mothers were interviewed about their goals, expectations, and intentions for feeding. The interviews were audio-recorded. Interviews lasted on average 1 hour and were later transcribed verbatim. A semi-structured interview protocol, the Internal Working Model of Feeding, (Hsieh & Shannon, 2005; Pridham et al., 1998) was used as a focused interview designed and conducted as a dialogue with mothers to help understand their stories of feeding. The interview included open-ended questions such as the following: What tells you when to start feeding your baby? Once a feeding gets started, what kinds of things does your baby do to keep it going? What kinds of things do you do? What brings a feeding to a close? What is important to you about your baby's feeding now? What do you want to accomplish/goals with your baby's feedings? How do you know if your goals are being met? If your baby's

feedings were just the way you'd want it to be, how would it be the same or different from the way it is now? In addition to these questions, at the post-discharge interview, mothers were also asked how feeding was the same or different now that they were at home as opposed to when they were in the NICU. During the interview, selected portions of the just-completed video-recorded feeding were replayed for the mothers to aid recall and facilitate the telling of their stories. Video playback has been shown to increase awareness of one's own and the other's behavior (Kagan, Schauble, Resnikof, Danish, & Krathwoh, 1969; Larsen, Flesaker, & Stege, 2008). Portions of the video were selected on the basis of a decision the mother appeared to have made (e.g., mother removes nipple), a change in infant behavior (e.g., infant has fallen asleep), or a change in maternal behavior (e.g., the mother begins to move the nipple in and out of the infant's mouth). Mothers were encouraged to reflect on what the feeding was like for them and for their infants, what they and their infants were trying to accomplish during the feeding, how they were going about it, and how they determined how well things were going during the feeding. After the feeding mothers completed a demographic data form.

Analysis

Demographic data were analyzed using descriptive statistics to illustrate parents' educations, ages, incomes, and ethnic backgrounds. A directed content analysis was conducted to identify major themes related to a mother's IWM of feeding. Directed content analysis allows for a structured deductive approach to qualitative data. Although the content of the analysis is directed by a theoretical framework or concept, this type of concept analysis allows for induction of new categories relevant to the framework. Due to this feature, it is the form of content analysis most useful in extending knowledge about a particular phenomenon. In summary, directed content analysis occurs via coding, data reduction, and identification of themes in relation to predetermined content categories (Hsieh & Shannon, 2005). The coded categories from the IWM were: (a) expectations concerning the infant's agendas and what feeding involved; (b) intentions concerning the infant's feeding, including the mother's responses to infant agendas; (c) expectations about what a feeding should be like, expressed as criteria for structuring the feeding; (d) expectations for amount of an infant's feeding, expressed as criteria for evaluating intake; (e) expectations concerning how well the infant's feedings were going; (f) expectations concerning the infant's feeding participation in relation to the mother's participation; (g) expectations concerning the patterning of feedings in relation to each other throughout a day; and (h) types of information used to make feeding decisions. Subsequently, thematic analysis was conducted, in which the researchers permitted themes grounded in the data to emerge. The hybrid analysis approach combined deductive directed content analysis and inductive thematic analysis, and is similar to a process described by Fereday and Muir-Cochrane (2006). This approach permitted analysis of specific aspects of the IWM that are of interest to the researchers, as well as permitting recognition of new patterns in the data.

Coding was conducted by the second author. Coded segments of the text were then, when applicable, sorted into the above-mentioned predetermined categories. Subsequently thematic analysis was conducted, in which the codes were reexamined independently of the predetermined categories, reshuffled, and resorted as the subthemes emerged. The analysis was an iterative process that relied largely on the cutting and sorting technique (Ryan & Bernard, 2003). Three themes emerged; each theme was reviewed and reworked by the second author. An expert in the field of IWM reviewed the themes with the primary author to ensure dependability.

Rigor

Trustworthiness and credibility of the study were promoted by carefully monitoring the research process. Interviews were conducted by both authors when feasible, but to maintain consistency the first author participated in every interview. A trusting relationship and increased data credibility were established by prolonged engagement with the participants. The study spanned from 3 to 9 weeks for any one dyad. Mothers were contacted after the first interview concerning infant feeding progression and possible discharge plans. The interview was enhanced by playing back parts of the video to aid maternal recall. The accuracy of each typed transcript was checked by the second author and compared to its corresponding audio recording. During the process of content analysis, each interview was read many times to ascertain its features, for coding, and for conduct of thematic analysis.

Results

Seventy-five percent of the participants were African American ($n = 9$), and 25% were Caucasian ($n = 3$). Eighty-three percent had a high school diploma or greater ($n = 10$), and 33% had an income less than \$10,000 a year ($n = 4$). Fifty-eight percent of the mothers were between 18 and 24 years of age ($n = 7$), and 42% were single/never married ($n = 5$). At birth, 50% of the infants were between 33 and 34 weeks gestation ($n = 6$). Fifty-eight percent of infants were female ($n = 7$). None of the mothers were exclusively breastfeeding but three were breast- and bottle-feeding.

The analysis resulted in identification of three themes with eight sub-themes. The three themes were (a) expectations for the feeding experience; (b) expectations of the baby's capabilities; and (c) goals for feeding. Sub-themes are described in relation to each theme below. Themes are divided into "early, in hospital feedings" and "later, after discharge feedings."

Theme One: Expectations for the Feeding Experience

This theme describes the mothers' feeding experiences and their concerns about the health status of their infants from hospitalization to transition to home. Mothers who expressed this theme were stressed by the infant's feeding while in the hospital. Later on at home, mothers felt more comfortable with their feeding experiences. The theme was composed of the following sub-themes: (a) maternal feeding practice experience, (b) the infant's breathing and sucking coordination, and (c) infant behavior.

Maternal feeding practice experience—At the second interview, mothers compared their early feeding experiences with their later, at-home feeding experiences. Mothers described their feeding experiences as follows:

In the hospital it was more stressful because I was trying to make sure that she was...I didn't know that she was not going to have a problem breast feeding and trying to make sure that she was getting enough fluids in her and everything. It was more something... I mean I have to do it now too but before I was just like I have to get her to eat, so, in that respect it's been a lot easier. It's been really good. I mean I'm surprised at how easy it's been. I've heard lots of women having trouble with breast feeding with full-term babies so it's just been really nice to not [be] having any problems with that regards. (Mary)

It's pretty good. She just...she got a whole lot better than when she was in the hospital. I'm not frustrated to feed her any more. It's a lot easier. (Faye)

It was easy because I learned how to feed her better than I did at first. At first I was kind of nervous, but now I'm more comfortable with it. (Pat)

Well when he was in the hospital, it was a little slower and he gradually started picking up on it so now he's drinking like a normal baby should. (Erica)

Mothers described the earlier feedings as more difficult than the later feedings. Earlier feedings were more difficult because mothers were worried about the infant not getting enough to eat and because the infant was not coordinated in sucking, swallowing, and breathing.

Infant's breathing and sucking coordination—Mothers claimed that their infants were unable to feed very well because the infants needed to learn breathing and sucking coordination. During the in-hospital feedings, some infants had oxygen desaturations registered by alarms or they had apneic episodes accompanied by bradycardia and oxygen desaturations. At home, the infants achieved the breathing and sucking coordination.

[Early feeding] It was difficult, she didn't know how to suck, breathe, and swallow at the same time so she alarmed a lot and I had to take the bottle out of her mouth and let her catch her breath every now and then. (Faye)

[Later feeding] Yeah it's a lot easier now. She knows how to do it. I mean she knows how to suck the bottle and so she knows how to suck and swallow and breathe at the same time so it is pretty easy now to feed her since she has been home. (Faye)

[Early feeding] She has to coordinate the sucking and breathing in between. That's probably the hardest things she has to learn, but she learned pretty quickly to me. (Pat)

[Later feeding] Yeah, she sucks more between her breathing cause usually she'd suck more and eat a little bit but now she just eats more and she breathes a little bit less but she still paces herself like she used to though. (Pat)

In the NICU some mothers did not understand the difference between the infant having oxygen desaturations during feeding and the infant having apneic and bradycardic episodes with desaturations during feeding. However all mothers understood their premature infant could not coordinate their sucking, swallowing, and breathing simultaneously. Mothers found it difficult to help co-regulate their infant's feeding. During feeding, co-regulation involved observing and being able to interpret the infant's behaviors so they knew when to take the bottle out so the infant could breathe and when to call the nurse so the feeding could end. At home, the infants achieved the breathing and sucking coordination and feedings were easier.

Infant behaviors—The preterm infants demonstrated behaviors that made it difficult to achieve in-hospital feeding goals. These behaviors included sleeping, fussing, latching on, or becoming agitated. Eventually, the infant gained more ability in sucking, swallowing, and overall activeness, which made feeding easier once the infant was at home.

[Early feeding] Umm...the feeding was interesting. She sleeps a lot, so to actually wake her up to get her to eat is kinda, I don't know how to describe it. It makes you nervous cause you don't want to try and force feed her, but at the same time you know she's gotta wake up and try to eat something. (Ciara)

[Later feeding] She's pretty active. She gets excited, but I think she's starting to recognize the bottle better. She responds to that. (Ciara)

[Early feeding] Well, the last time that I fed him was like the day he was born and he was very sleepy and non-responsive. I mean to the point that I couldn't even get

him to open his mouth to latch on, so we [mother and nurse] attempted like probably for 20 minutes. (Donna)

[Later feeding] Well I think when we first got him home there still was that learning how to suck and you know swallow and that thing. He was doing it pretty good but he has really got it down pat now. Even before when he was hungry he'd have that sucking going on with nothing in his mouth. Now he'll suck on his fingers, blankets, bibs anything he can get and put in his mouth to suck on. (Donna)

[Early feeding] If he's asleep like today he doesn't want to eat. I want him to be more alert for his feedings. (LaToya)

[Later feeding] He starts wiggling around and wakes up crying. And he'll try to eat anything, if anybody holds him he'll try to eat their nose or jaw or something so... (LaToya)

[Early feeding] Well this is only the what? Third try so; this was the best one so far though because she is learning how to latch right on. (Aisha)

[Later feeding] I mean, she just goes right for it. I mean opening her mouth. I mean it's just not hard to get her to latch on at all. (Aisha)

In the hospital mothers found it difficult to bring their infants to a quiet alert state for feeding. As their infants matured they were waking for feeding and showing signs of hunger by sucking on their fingers or anything else that came near their mouths.

Theme Two: Expectations of the Baby's Capabilities

Although half of the participants had a previous child before having the premature infant ($n = 6$), they believed their experiences were insufficient to prepare them for taking care of a premature infant. The other half was first-time mothers without infant-care experience. They were taught and trained by nurses to care for their preterm infants. Mothers also learned through daily experience in caring for the infant. This theme included maternal decision-making concerning the amount of feeding, reading of the infant's cues, and feeding strategies.

Maternal decision-making for amount of feeding—At home, mothers watched for their infants' hunger cues and followed advice from the physicians and nurses.

[Later feeding] Well, I really try to go like along with the guidelines I learned in the hospital, and he'll let me know when he is ready to eat or had enough to eat. Specifically, well umm, I kind of go by what they [NICU staff] said in the hospital. They... it usually increases like, what was he at when he left the NICU? Um, he was a little over 4 ounces every, let's see, every 3 hours and then it went up to like 5 ounces every 4 hours and you know, I'm just trying to go by that and by what he seemed to need. Yeah, so I put another ounce in the bottle cause he just wasn't full, he didn't seem to be full enough or finished when I would stop [the feeding], you know when it [the bottle] was done. (Joyce)

[Later feeding] She was discharged taking 4 ounces. Now when she first gets up in the morning, we do 4½ ounces and she takes that with no problem and then we kind of alternate between 3½–4 ounces for the next two feedings. I just see how she takes it. (Ciara)

[Early feeding] Well since they [NICU staff] said he had been drinking 40 cc's. I thought he was going to drink more for me too, but he only drank 30 so I had to keep working with him, to you know, get him to take the rest. Yes, it is very important to me that he finish the bottle I'm given. (LaToya)

[Later feeding] If I put 2 ounces in the bottle and she's still sucking, that lets me know that she wants more so the next time I feed her I try to put like a half an ounce more and if she eats all that and seems like she is still hungry, I try to increase it each time that she shows me she wants more. (LaToya)

Once mothers had an opportunity to know their infants for a longer period of time they began to learn the infants' cues. Mothers went from feeding the prescribed amount to increasing the amount they gave their infants through trial and error by 2 weeks post discharge.

Maternal achievement of reading infant's cues—Mothers explained that they did not know much about the infants' feeding readiness cues during the early feedings. When they lived with their infants at home, they gained more understanding of their infants' feeding cues. The infant hunger cues included sucking fingers, crying, or opening the mouth.

[Early feeding] I just put the bottle in her mouth and if she starts suckling I guess keep going. (Iris)

[Later feeding] When she wakes up and starts whining and crying and I know that she is changed, I know that she is clean, I know that she is loved and played with, and talked to, and she still is fussing it can't be nothing else but she wants a bottle. And she doesn't want to take her pacifier so it can't be nothing else but she wants to eat. (Iris)

[Early feeding] Basically, like try sucking the bottle and stuff. Like, when he starts sucking at the nipple that lets me know that he wants to eat. Yeah. (Erica)

[Later feeding] Well usually I just wait until he gives me a signal and when he is hungry, but it usually is around every 3 hours. He'll start sucking his fingers and stuff letting me know he's hungry. He will start making noises and he will cry a little bit or try to anyway. Then that will let me know that he is hungry. (Erica)

[Early feeding] I have no idea [what her cues are]. Well, sometime, cause she opens her mouth and I give her the bottle and she'll start sucking, but if she doesn't I just take it out. (Pat)

[Later Feeding] When it was her time to feed, I know that much. Then she woke up crying. She like eats, every 3 hours. Right after she eats she goes right to sleep so then like she wakes up every 3 hours. She'll wake up and like 30 minutes before her feeding, I will fix her bottle and right on time she'll wake back up. She sets her own schedule. (Pat)

At home mothers were more confident in their ability to read their infants' cues of hunger and satiety. They also used the feeding strategies they learned in the hospital to maintain the feeding and ensure their infants were receiving enough calories.

Maternal feeding strategies—The mothers learned to maintain their infants' feeding through experimenting, experience, and advice from healthcare providers. The strategies included supporting the infant's chin, rubbing the infant's cheek, burping the infant, or moving/shaking the bottle.

[Early feeding] How do I keep the feeding going? Well it is going back to the you know, too much knowledge that I have, but yeah when I use to feed newborns, in my years of experience, if they don't suck, you sometimes give them like support under their chin and kind of show them. They are supposed to be doing that, and rubbing their face and stuff like that. (Donna)

[Later Feeding] Usually when he will stop sucking, I will just try to move the bottle around to stimulate him to suck more. I don't know if it's more shaking the bottle that's stimulating the nipple in his mouth to stimulate his tongue to suck more. That works or the finger to the cheek I have also done that a couple of times. (Donna)

[Early Feeding] Because she can't really get a good grip on the nipples so when you support her chin, she was getting a good grip. (Faye)

[Later Feeding] Usually when she starts moving around and getting whiny it means she needs to burp. That is why I tried to burp her and she ain't burping, so I put her bottle back in her mouth. (Faye)

[Early feeding] The first time the nurse just told me how she usually feeds her. She [nurse] said you really gotta get her to open her mouth so you can push the bottle all the way in so she can take it. Cause at first I was a little nervous about putting it all the way in. I was like; I don't want to choke her. She's so small. She [nurse] was like you have to put it in so she can get it, so I put it in and she just started sucking and it worked easier for me this time cause I knew how to do it. (Pat)

[Later feeding] To keep it going I guess rubbing the cheeks or something like that maybe, or sometimes if I think she like needs to drink more or she isn't drinking. I check to see if she's finished, I like pull it [the nipple] out a little bit and then she'll suck on it so that lets me know that she was just taking a breather. (Pat)

These mothers were told in the NICU that their infants must be able to nipple the entire feeding and be gaining weight before they were able to go home. Therefore, the goal was to maintain the feeding long enough for the infant to finish the bottle. After the mothers took their infants home they continued these strategies to ensure the infant was acquiring the calories needed for growth.

Theme Three: Goals for Feeding

This theme demonstrated the importance of feeding and the feeding interaction for mothers. There were two sub-themes included: (a) maternal feeding goals/expectations; and (b) maternal and infant interaction.

Maternal feeding goals/expectations—Mothers described both their short-term and long-term goals for infant feeding. The short-time goal included the infant getting calories, finishing the bottle, or gaining weight. A long-term goal of feeding was growth and a healthy infant.

[Early feeding] My goals for feeding her are for her to eat the milk, digest it well, and grow. Those are my goals. (Faye)

[Later feeding] I just feed her and hope she is growing and gains weight. Just that, that's why I feed her. (Faye)

[Early feeding] Basically so he can get strong and come home with me. (Erica)

[Later feeding] Just gain more weight and be bigger and get all the nutrients and stuff he needs to grow. (Erica)

[Early feeding] So she won't lose or gain too much weight. (Brenda)

[Later feeding] I know she is growing and gaining weight, 7 pounds 7 ounces. (Brenda)

[Early feeding] She is getting enough. I guess that would be something different, you know making sure that she is not losing weight or fluids because she is on the verge of being too small. (Mary)

[Later feeding] I just want him to be healthy. (Mary)

Early in the feeding the mother's goals mimic the NICU milestones infants must reach before going home. After discharge infant feeding and growth are still major concerns for mothers.

Maternal and infant interaction—In early feedings, mothers focused on wanting to spend time with their infants. Mothers were also likely to focus on how much formula the infant took and taking the infant home. During the post-discharge feeding, mothers reported the infants' feeding time as a joy and a time of connection or bonding between the two of them.

[Early feeding] Getting to hold her in my arm and spending that time with her. Just watching her eat and looking at her. (Brenda)

[Later feeding] I enjoy feeding her. I mean holding her and stuff while I feed her. I just like looking at her when I feed her because she is so adorable. (Brenda)

[Early feeding] Right now it is giving me time with her, so that is important, it is the only time I really have been able to spend with her is when I'm feeding her. (Mary)

[Later feeding] Time alone with me and closeness with me. She gets to be held, she likes that. She can be held all day and she would prefer that, I'm sure. (Mary)

[Early feeding] Like a time to ourselves, like we can learn how to cuddle each other. Like, you know have a mom-daughter experience, like closer. (Gina)

[Later feeding] Bonding. Yeah, because I cuddle her and she opens her eyes more most of the time because when she's not eating, she's asleep and she doesn't like to wake, but sometimes during her feeding she's awake and looking around and stuff. I like that. (Gina)

[Early feeding] I don't know. I believe my main expectation right now is just having her home. Umm...as far as her feedings go as long as she still shows an interest in the bottle and she wants it, I'm comfortable with that. (Ciara)

[Later feeding] The bond, being close to her, sometimes I don't want to share the feedings. I'll do it myself, I can do it. Yeah, just bonding with her. (Ciara)

Early on mothers wanted to spend time with their infants. Later mothers were more concerned with developing a relationship or a bond.

Discussion

This study aimed to gather information that could be used to better understand the development of mothers' IWM of feeding, beginning in the NICU when mothers were first learning to feed the infant until the infant was 2 weeks post-discharge. A mother's decision-making in respect to her infant's feeding is a function of her IWM of feeding and its characteristics. Three themes concerning mothers' expectations of themselves and/or their infants and the feeding experience were derived from the interview transcripts about mothers' IWM of feeding. The three themes were (a) expectations for the feeding experience, (b) expectations of the baby's capabilities, and (c) goals for feeding. Within

these themes eight sub-themes were identified. Two changes in the mothers' IWM of feeding were identified in this sample.

The first change noted in the sample was that as mothers had the opportunity to know their infants for a longer period of time they began to learn the infants' cues, and through trial and error they learned what worked and what didn't work for their infants. Previous research has shown that by the time of hospital discharge mothers were not fully confident in their ability to feed their infants (Baker, 1991; Reyna, Pickler, & Thompson, 2006). Our mothers were not fully confident in making decisions about continuing or stopping the feeding even with strong stop cues from the infants. For example, one infant had several instances of apnea, bradycardia, and desaturations and the mother wanted to continue feeding. Reyna and her colleagues (2006) also had mothers in their study who did not recognizing infant difficulties with sucking, swallowing, and breathing as a problem. However by 2 weeks post-discharge mothers were very confident in knowing when their infants were hungry and when their infants were satiated. Mothers went from feeding because the nurse told them it was feeding time to expressing confidence in knowing their infants' cues by 2 weeks post discharge.

The second change noted was maternal interest in a relationship or bonding. In the first few weeks after discharge infant growth was still a major concern, but more mothers mentioned wanting to have a relationship or bonding time with the infant. None of the mothers spoke of the infants as persons with their own individual wants, needs, or goals. This finding is consistent with Schroeder and Pridham (2006) who found that the longer mothers knew their infants they were better able to describe knowing the baby as a person.

Nurses are in the ideal position to explore a mother's IWM of feeding and guide her in learning the infant's cues so when the infant is ready to be discharged from the hospital the mother is confident in her ability to feed her prematurely born infant. All mothers focused on the infants' skills in feeding and infant weight gain because these were criteria for discharge from the hospital. Even at 2 weeks post hospital discharge infant size was still important and mothers were still encouraging infants to eat by manipulating the bottle. Mothers were not wondering what the infants were experiencing or trying to accomplish. For example, when the infant had a pause in sucking, was it a stop to breathe? Some mothers at 2 weeks post discharge seemed to believe the infants were still falling asleep during the feeding and did not recognize the pauses as breathing breaks. Nurses could discuss these cues with a mother and help her trouble shoot when to offer the infant more formula and when to gavage feed based on the infant's cues. They could also provide anticipatory guidance during the hospital stay so mothers will understand that when their infants first start oral feeding it is acceptable for them to not finish the bottle. Nursing knowledge could help guide mothers through the transition that occurs between hospitalization and discharge.

This study brings up several questions for future study. Mothers were processing the information and organizing goals on some hierarchical level. For example, the mother whose infant was having apneic and bradycardic episodes and she wanted to continue the feeding, she could state that her infant's heart rate was dropping but how was she processing that information? Where on the hierarchy did bradycardia fall in reference to feeding? How did she see his feeding contributing to his bradycardia or did she see it contributing? What conditions pertinent to a mother, an infant, or their relationship determine the importance of her feeding goals? How and under what conditions do goals or expectations and intentions shift? We only had a few breastfeeding mothers in this study but future research examining if there is a difference between breast-feeding mothers' and bottle-feeding mothers' IWM of feeding could also enhance our understanding of mothers' expectations and intentions for feeding.

The strength of this study is that it examines mothers' IWM when they first begin feeding their infants in the NICU. By interviewing mothers right after the feeding and playing back parts of the video recording, accurate information about the mothers' IWM of feeding at that point in time was obtained. The findings may provide insight to NICU nurses and clinicians on what concerns mothers have and feeding problems mothers are dealing with when they begin to feed their infants. One limitation is that the findings may not be generalized to other populations. Sixty percent of the mothers in our study were primiparas and one had a previous preterm infant so it is unclear if there is a difference in the development of a mother's IWM of feeding depending on her parity or experience. Due to time limitations, participants could not review the transcripts for accuracy and confirmation, so the study's confirmability could be called into question. This potential limitation is offset by the fact we also identified working model components of goals, expectations, intentions, and strategies used as mothers told their stories about feeding their premature infants. These working model components were previously identified by Pridham and her colleagues (2004).

Despite the limitations of the study, a developmental trajectory between mothers' early participation in nipple feeding and participation 2 weeks after discharge to home was identified with this study. The infant's developmental trajectory has been documented in the literature. Once infants can coordinate suck, swallow, and breathe they will open their eyes to engage the mother (McGrath & Medoff-Cooper, 2002; Thoyre, Shaker, & Pridham, 2005). The mothers in this study also recognized that once the infants could coordinate suck, swallow, and breathe they opened their eyes and were available for interaction. Growth was still a major factor in the first few weeks after discharge but more mothers were beginning to talk about wanting to have a relationship or bonding time with her infant.

Conclusion

The infant's transition to full oral feeding represents a developmental feeding trajectory for the mother and the infant that begins in the NICU and extends into the early discharge period (Reyna et al., 2006). The mother's developmental feeding trajectory is not as well described. In the early weeks of feeding mothers are concerned with intake. In the first few weeks after discharge mothers still focus on intake, but they also begin to focus on their relationship with their infants.

Mothers in this study shared several features of IWMs of infant feeding and expressed them in the themes and their narrative response to interview questions. Variation of these themes was revealed within subthemes. Mothers were making decisions about starting and stopping feeding but the criteria they were using are still not well understood. An understanding of mothers' expectations and intentions for feeding in relation to these as well as other sub-themes yet to be identified could enhance our understanding of feeding decisions.

How Might This Information Affect Nursing Practice?

This study's findings show that nurses are in an ideal position to engage mothers in conversations about feeding. They can help them not only see the feeding from their infants' perspectives but also expand their IWM to other possibilities. It is important that nurses help mothers continuously and individually over the time of the infants' hospitalizations. We recommend that nurses spend time during feeding to help mothers understand the infants' behavior and to empower mothers to focus on their infants' nutritional intakes, in respect to hunger and satiation cues, while at the same time enjoying the development of a maternal bond. In addition if the nurse understands the mother's expectations and intentions for feeding, interventions can be tailored to the dyad.

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