

# Roles, perceptions and control of infant feeding among low-income fathers

Kirsten E Anderson\*, Jennifer C Nicklas, Marsha Spence and Katherine Kavanagh

Department of Nutrition, University of Tennessee, Knoxville, 229 Jessie Harris Building, 1215 West Cumberland, Knoxville, TN 37996-1920, USA

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## Abstract

**Objective:** Introduction of solid foods before the recommended age of 4–6 months is a common practice in the USA, and appears to be especially prevalent among infants who are enrolled in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Currently, little is known about how fathers influence early infant feeding decisions, outside the decision to breast- or formula-feed. The purpose of the current study was to explore how fathers perceive the role they play in feeding and caring for their infants.

**Design:** Participants were twenty-one male caregivers, who were fathers or partners of the mothers of WIC income-eligible infants residing in two rural East Tennessee counties. In-depth, audio-taped telephone interviews were completed. Interviews were transcribed, coded and analysed according to standard grounded theory procedures to identify emergent concepts. These concepts were explored and linked together to become themes.

**Results:** Three themes emerged: (i) fathers' roles; (ii) fathers' perceptions; and (iii) control. Concepts within the theme of fathers' roles included physical and emotional support for both mother and infant, validation of maternal decisions, and financial support. In the present study, fathers' perceptions were primarily shaped by their own experiences, advice from those with experience, and information sought by the fathers. The theme of control appears to be the linkage between the fathers' attempts to modify infant behaviour and infants' response.

**Conclusions:** A final conceptual model was created to explain the interrelated nature of the themes and may be helpful to those who work with fathers and/or families of new infants.

**Keywords**  
Infant feeding  
Fathers  
Low income  
Behaviour modification  
WIC  
Qualitative research

Childhood overweight and obesity is a complex, multi-faceted health concern that is expected to continue its upward trend in the 21st century<sup>(1–4)</sup>. Conditions such as diabetes<sup>(5)</sup>, metabolic disease<sup>(6)</sup>, CVD<sup>(7)</sup>, asthma<sup>(8)</sup> and sleep apnoea<sup>(9)</sup> are prevalent among overweight children. In addition, there appears to be a health inequity, with weight inversely associated with socio-economic status<sup>(10)</sup>. One piece of the obesity puzzle may be explained by rapid infant weight gain. Several researchers have linked rapid weight gain in early infancy to later overweight in childhood<sup>(11–14)</sup>. It is unclear how the mode of early infant feeding may impact this rapid rate of gain. The American Academy of Pediatrics Committee on Nutrition recommends delaying the introduction of solid foods to at least 4 months of age or longer<sup>(15)</sup>. However, recent research suggests that early introduction of solid foods appears to be prevalent in the USA<sup>(16)</sup> and may be associated with

accelerated infant weight gain<sup>(11)</sup>. Participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) appear to be more likely than those not participating in WIC to introduce foods before this 4 month recommendation<sup>(17)</sup>.

How families decide to feed infants is likely to be influenced by many factors, including exposure to WIC nutrition education, paediatrician advice, grandmother advice and others<sup>(18,19)</sup>. In addition, several studies have reported on the influence of the infant's father, or partner of the mother, on the decision to breast- or formula-feed<sup>(19–22)</sup>. However, little is known about how these male caregivers influence the introduction of foods other than breast milk or formula. The aim of the current project was to investigate the perceptions of male caregivers of 4- to 6-month-old infants regarding their roles in decision making about infant feeding and specifically the introduction to solid foods.

\*Corresponding author: Email Kirsten.kander33@gmail.com

## Methods

### Script development

An approximately 30 min long interview script was developed based on a topical literature review and feedback received from an expert in maternal and infant nutrition. Six content areas were included in the script (Table 1). The script was used to guide discussions with the male caregivers. However, if new topics arose during a conversation, the researcher could probe more deeply and did not have to follow the script with rigor. This method of interviewing, referred to as the 'general interview guide approach', is outlined by Patton<sup>(23)</sup>. As new ideas emerged in the initial interviews, the script was modified to include both questions in these new emergent areas and questions from the original script.

### Recruitment, screening, eligibility and interviewing

Recruitment was conducted through: (i) a voluntary birth registry housed at the University of Tennessee, Knoxville;

(ii) fliers distributed at one WIC clinic; (iii) an advertisement in a daily student newspaper; (iv) and word-of-mouth. Potential participants were encouraged to contact the project's research lab to be assessed for eligibility. Approval for the study was granted by the Institutional Review Boards from the University of Tennessee and the State of Tennessee.

To identify male participants, mothers were screened first. Eligibility requirements included having an infant who was 0–6 months old; being a WIC participant or meeting the WIC income eligibility guidelines (WIC income eligibility is based on a particular income level per particular household size, set at 185% of the Federal Poverty Level); and having a male caregiver in the infant's life who was either the father or someone who functioned as a father figure to the infant. In addition, the male caregiver had to speak English. The male caregiver could not be a male family member (i.e. brother, infant's grandfather, etc.) or companion (without the role of father figure in the infant's life) of the mother.

Any mother who contacted the research lab regarding the study was asked if there was a male caregiver involved

**Table 1** Content areas (1–6) and questions from interview script for low-income fathers

<p><b>1. Father's role in infant feeding</b></p> <p>A. If I were to spend a normal day with you, what kinds of things would I see you do with your baby?</p> <p>B. How did you and your wife/fiancé/girlfriend agree on who is in charge of certain baby-related tasks? Probe: What kinds of new things did you have to learn to do to help with these tasks?</p> <p>C. How would you compare your involvement in your baby's life with that of other fathers that you know or have heard about?</p> <p>D. Was there anything that you wish someone had told you about your baby or being a father before you had the baby?</p> <p><b>2. At what age foods other than breast milk or formula are being introduced to infants in this population</b></p> <p>A. What kinds of things has your baby given to eat or drink in the first 4 months? Probe: What is the strangest thing that your baby had to eat or drink before they were 4 months old?</p> <p>B. How did you support your partner while she was breast-feeding? Probe: Why did you and your partner decide to breast-feed? Probe: Why did your partner stop breast-feeding?</p> <p><b>3. What are the triggers associated with early introduction of these foods</b></p> <p>A. Why did you give your baby these foods? (<i>Be specific about each food he has previously mentioned</i>) Probe: Do you think your baby reaching for food, etc., means that he/she is ready for other foods? ● If yes, ask 'What is it about this behaviour that makes you think your baby is ready for foods?' ● If no, ask 'What makes you think your baby is not ready for foods, when he/she is reaching for food?'</p> <p>B. Why did you think the baby was 'not getting enough' or 'needed more'? (<i>Be specific about each reason he has previously mentioned</i>) Probe: How does cereal help your baby 'get more'? Probe: How much crying is ok? Probe: Is it the type of crying or the place or the timing that matters? Probe: How much waking during the night is okay?</p> <p>C. Did offering your baby these foods change any behaviours/growth/hunger of your baby? Probe: In what way did your baby change? Probe: If your baby didn't change, after giving these other foods, what did you do?</p> <p><b>4. Primary influences on infant feeding decisions</b></p> <p>A. Who do you ask for help when deciding how to feed your baby? Probe: How did you decide the advice was good? Probe: How did you decide the advice was not good? Probe: If you did not agree with that advice, what would you do?</p> <p>B. How easy was it to follow the advice given to you by WIC staff or your doctor? Probe: How consistent was the advice given among health-care providers?</p> <p>C. How has the price of formula influenced some of the decisions you have made when it comes to feeding your baby?</p> <p><b>5. Assessment of how one decides to stop a feed (deciding whether the caregiver or the infant is in control)</b></p> <p>A. How do you know your baby is hungry?</p> <p>B. Do you believe it is possible to overfeed a baby? Probe: Please explain why you believe it is/is not possible to overfeed a baby</p> <p>C. How do you know your baby is full?</p> <p><b>6. Perceptions of and attitudes toward infant fatness</b></p> <p>A. What are some ways you decide your baby is healthy? Probe: Facilitator probe for definitions of each example</p>
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WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.

in the infant's life. Respondents were generally mothers recruited via flyers from WIC, newspaper or word-of-mouth. Mothers contacted via the voluntary university birth registry had previously agreed to be contacted and screened by the research lab. Screenings occurred over the telephone to determine if an infant had a male caregiver who met eligibility requirements for the current study. If a potential male caregiver was identified, contact information was collected and the lead researcher verified interest via telephone call. If interested in participating, identified male caregivers were mailed a consent form and an interview was scheduled. Informed consent was verified through audio-recorded verbal acknowledgement that the male caregiver had received, read, understood and chose to consent to the interview.

All interviews were conducted by the lead researcher for continuity of questioning and to allow for more rapid identification of emerging themes. Upon completion of the interview, male caregivers were mailed modest compensation. Saturation for the study was defined to be the point at which no new additional themes or categories developed. Few new themes developed after the twelfth interview and saturation was reached by the twenty-first interview. This point of saturation is supported by the estimated number required to generally reach saturation as identified by Guest *et al.*, who found that twelve in-depth interviews are generally enough to reach saturation<sup>(24)</sup>.

### **Data coding**

Data analysis and development of the conceptual model followed a systematic procedure of coding, constant comparison, categorizing and memoing, as outlined by Miles and Huberman<sup>(25)</sup>. Interviews were transcribed verbatim into a word-processing software program by research assistants trained in transcription. Subject names were replaced with identification numbers. Inductive coding<sup>(26)</sup> was utilized for the creation of descriptive and inferential coding, as explained by Miles and Huberman<sup>(25)</sup>. Two researchers coded the first interview separately and independently developed a set of codes which included a detailed description of each code. Subsequently, the researchers met and examined the independently developed codes, and agreed upon the codes and definitions to be used in coding the rest of the transcriptions. Within the second and third interviews, additional codes were identified and added to the list of working codes. Segments of coded text varied in length and depth of topic and could contain multiple codes. The researchers met weekly to discuss any new codes and to reach mutual agreement upon the coding of transcripts. At each weekly meeting, three transcripts were discussed. Inter-reliability scores were calculated for each individual transcript and for the average of the three transcripts coded at each meeting. Initial inter-reliability coding of the first three transcripts was 60%. Few new codes

surfaced after the third meeting. With each meeting, average inter-reliability increased until the researchers reached 97% original agreement at the final (eighth) coding session. Interviewing continued until saturation was achieved, as determined by the researchers during the coding process.

### **Data analysis**

Data analysis continued, after the descriptive and inferential coding was complete, through a process in a series of integrated steps. First, text from coded transcripts was copied from the word-processing file and inserted into a file in an electronic spreadsheet program. Within the file, each tab housed text for a specific code. As noted prior, each segment of text could contain multiple codes. For this reason, each segment was copied into each relevant tab, thus remaining associated with any other codes that were applied to that segment of coded text. The primary researcher examined each set of data by descriptive and inferential code to determine whether there were patterns within each code. Memoing was utilized several different ways within the spreadsheet of organized codes. First, it was used to summarize or question the content of short passages of coded text. Second, it was used after reviewing all of the text related to a specific code to summarize the ideas within the text applicable to the specific code. Finally, memoing was used to relate the ideas within one code to those present among other codes.

In addition to memoing about how the information between codes related, because all codes were left attached to every section of coded text, the researcher was able to examine the recurrence of multiple codes that appeared frequently in association with the code group being examined. Codes that appeared together frequently were recorded at the top of each code category tab in the spreadsheet. This not only identified patterns that emerged between codes, but also helped to cross-validate linkages. The process of determining ideas and organization within each code and then between codes is similar to that used by Jacelon and O'Dell in nursing research<sup>(27)</sup>.

Patterns codes were developed as the researcher began to identify linkages among coded materials through memoing in the spreadsheet. For the current study, pattern coding occurred later in data analysis, after relationships between certain codes were better understood. Organizing robust pattern codes and pattern sub-codes led the researcher to several related concepts, which were categorized into themes.

Through discussion of metaphorical modelling<sup>(25)</sup> and revisiting the memos and pattern codes with two other researchers, several exploratory conceptual models were created. The final model was based on consensus about the concepts related to infant feeding and the inter-relationships between the themes identified.

**Results**

**Participants**

Ninety-three mothers were screened for presence of an eligible male caregiver. Table 2 outlines recruitment sources of participants and number screened. The primary source for recruiting participants was through the voluntary birth registry. Screening for participants from the WIC occurred late in the screening process, secondary to a delay in receiving the differential institutional review board approval from the State. Fifteen (71%) participants had WIC-enrolled infants, while six (29%) had infants who were WIC income-eligible, but did not participate in WIC. The primary reason for ineligibility was reporting income higher than the WIC eligibility criterion (47% of those screened). Three infants were >6 months of age at the time the mothers were contacted, eight of those screened had no male caregiver, and two male caregivers did not speak English. In addition, eleven identified male caregivers refused to participate. Reasons for ineligibility and refusal to participate are displayed in Table 3.

All participants resided in one of two East Tennessee counties, ranged in age from 21 to 57 years and represented a variety of racial backgrounds and education levels. These data are presented in Table 4. Infants ranged in age from 3 to 6 months. Ten participants were first-time fathers, with the remainder reporting having between two and four other children. Ten participants were married to

**Table 4** Characteristics of the participating low-income fathers: male caregivers, who were fathers or partners of the mothers of WIC income-eligible infants residing in two rural East Tennessee counties

Variable	<i>n</i>	%
Age (years)*		
18–24	3	21
25–34	8	57
35–44	2	14
45–54	0	–
55–64	1	7
Race/ethnicity*		
White	9	64
Black	2	14
Asian	1	7
Other	2	14
Highest level of school completed*		
Less than high school	1	7
High school graduate	5	36
Some college	1	7
Associate’s degree	2	14
Bachelor’s degree	2	14
Graduate degree	3	21
First-time father		
Yes	10	48
No	11	52
Marital status		
Married to partner	10	48
Not married to partner	11	52
Biological father of infant		
Yes	18	86
No	3	14

WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.  
\*Demographic data for only fourteen of the fathers were obtained for these variables.

**Table 2** Recruitment venues of screened women (mothers of WIC income-eligible infants) and participants (male caregivers, who were fathers or partners of the mothers), rural East Tennessee

Recruitment source	Screened women ( <i>n</i> 93)		Participants ( <i>n</i> 21)	
	<i>n</i>	%	<i>n</i>	%
University of Tennessee voluntary birth registry	77	83	17	81
WIC	7	8	0	0
Local gathering of mothers	6	6	1	5
Word-of-mouth	2	2	2	9
University student newspaper advertisement	1	1	1	5
Total	93	100	21	100

WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.

**Table 3** Reasons for ineligibility and refusal to participate among the screened women (mothers of WIC income-eligible infants) and participants (male caregivers, who were fathers or partners of the mothers), rural East Tennessee

	<i>n</i>	%
Reason for ineligibility*		
Income above WIC income criterion	48	59
No male partner	8	10
Infant older than 6 months	3	4
Male caregiver did not speak English	2	2
Reason for refusal to participate†		
Eligible male partner, but he chose not to participate	7	9
Male caregiver agreed to the interview, but did not complete the interview	4	5
Total	72	100

WIC, Special Supplemental Nutrition Program for Women, Infants, and Children.

\*Number of those ineligible = 61.

†Number who refused = 11.

their partners, while eleven were not. Based on data from the initial screen, three participants were not the biological father. Twenty participants perceived themselves as being 'more involved' in the care of their infants than other fathers they knew. However, one participant reported he was at least 'as involved' as other fathers. All men participated in the interview as if they were the father figure in the infant's life and therefore are referred to as the 'father' for the remainder of the paper.

### ***Emergence of themes***

Initially pattern codes were categorized into the following five major themes: (i) perceptions; (ii) motivators; (iii) roles; (iv) behaviour modification; and (v) control. However, it became apparent during the process that two of the five themes, behaviour modification and motivators, were actually smaller, interrelated concepts within the three major themes of perceptions of fathers, roles of fathers, and control related to the interaction between the father and the infant. Each theme is built on several concepts.

### ***Roles***

The theme of roles is built on a number of concepts identified by fathers. These could be proximal, such as feeding or entertaining the infant, or more distal, such as supporting the mother through validation of her decisions or taking care of other children or herself. Therefore, this theme is comprised of the concepts of physical and emotional support, validation of maternal decisions, and financial support. Physically, this role was manifested in the performance of daily tasks, such as preparing bottles, changing diapers, and holding and playing with the infant. This also could include simply taking the infant into another physical space to allow the mother the ability to 'do whatever she needs to do', including showering, working out or tending to other children. Among fathers with more than one child, the importance of involving both parents was especially common in order to accomplish daily tasks.

Fathers spoke of their role of offering emotional support to the family. The infant received direct emotional support through play and activities meant to entertain the infant. Fathers talked about wanting to make the infant smile or laugh and identified a healthy infant as one who was 'happy' or 'content'. Development of the infant also was important to the fathers and resulted in activities with the infant that were inherently educational or conducive for infant development. Less proximal was emotional support offered to mothers, which was manifested in offering to perform caregiver duties, thus allowing mothers to have space and time for themselves. Fathers spent time with their partners and talked about offering emotional support through 'being an advocate' or being there if mothers needed to 'vent'.

The fathers' roles appeared to encompass validation of their partners' decisions through justification, gathering second opinions or stating justification for decisions

regarding infant feeding. The following quote portrays this sentiment:

Well, she thinks about it more than I do, so she's always thinking of ways to improve whatever we do. She talks to me about it, and we'll make a joint decision. Honestly, I don't initiate much of the, you know, I kind of follow her lead because I think her intuition is better than mine.... as far as like decisions about what type of formula and stuff, we both have input but she is probably more of the decider.

Financial support of the family presented itself in the fathers' stories when they addressed the different types of activities in which they were engaged with the infant. This was often in the context of time, which was offered as a reason why they did not spend more or as much time as they would like with the infants. In this regard, unless the father clearly identified himself as a stay-at-home caregiver, the fathers noted the importance of their role in financially supporting the family as means of indirectly caring for the infant.

### ***Perception***

Perceptions of the fathers with regard to infant feeding were influenced by a number of concepts. In order of influence, these concepts included personal experience, advice from those with experience, advice sought by the father from sources such as books, the Internet, magazines, etc., and finally unsolicited advice that may or may not be generated by those who had experience with children. Fathers' personal experience generally came from those fathers who had other children, although some who did not have other children had experience with other infants, such as younger siblings or other relatives such as nieces or nephews. If mothers had previous experience with children, the fathers regarded this experience similarly to their own experiences. If previous experience was viewed as positive, this increased its value. Fathers with older children, whose development they were satisfied with, remarked on things like: 'If you do similar things you would expect a similar result'; or 'We liked the way our first son turned out. And we have been trying to copy what we did with him'. As experience increased, the less the fathers sought advice elsewhere: 'I actually raised my sister's baby from 2 days to 3 years. So, I didn't really have to learn anything this time around. I kind of knew what to expect'.

Advice from those who had raised children was important. Fathers sought advice and second opinions from experienced people and generally thought this advice was superior to advice from others with little direct care-giving experience. Advice from health-care professionals also was held to this standard. Generally, paediatricians and nurses at paediatric clinics did serve as a good source of advice owing to their experience as professionals who care for infants and children. Despite this,

advice from health-care professionals who did not have children was less valued than advice from health-care professionals who had experienced parenthood.

They [doctors] seem kind of eloquent sometimes. I guess you take it with a grain of salt sometimes, too. You know, like is this person telling me this and they probably don't even have any children? You know?

Other sources of advice included infant care books, the Internet, magazines, and pamphlets from their doctors' office or classes they attended on infant care. Although classes could be hosted by health-care providers or businesses marketing products to infants and children, there was no indication of valuing advice from either of these sources over another. When advice actively was sought from these sources, fathers generally regarded the information as trustworthy and accurate. However, unsolicited advice was perceived to be less valuable and, especially if the source was a mother or mother-in-law, possibly outdated. The decisions of whether or not to accept and act on advice were ultimately filtered through fathers' own experiences and whether or not the advice seemed sensible.

### *Control*

The theme of control emerged from concepts related to behaviour modification activities by the father and the infant's response. Behaviour modification actions of fathers directly related to feeding included feeding the infant, introducing cereal and introducing solid foods. Fathers used feeding to modify crying or fussing behaviours in infants. If infants' responses were positive, then the behaviour modification strategy continued. Although generally aware of infant hunger and satiety cues, these cues were not always attended to if there were other pressures exerted on the fathers, such as prescriptive advice from mothers. In situations where feeding the infant did not produce the desired behaviour, the solution was to explore use of alternative infant formulas until the behaviour was acceptably modified (i.e. lactose intolerance, spitting-up).

Introduction of cereal was another concept within the theme of control. Behaviours targeted for modification included quelling perceived extreme hunger ('...they weren't getting enough'), sleeping through the night or spitting-up after feedings. If the infant's response was positive, such as the infant appearing satisfied with the feed, extended duration of sleep or spitting-up less, fathers continued adding cereal to the infant's bottle. Introduction of solid foods was initiated for similar reasons, although behaviours targeted for modification were less frustrating for fathers than those targeted by infant cereal. Although there was some recognition that paediatricians recommend starting solid foods at particular developmental stages, the primary motivation for introducing these foods was that the infant appeared to desire the food, by, for example, reaching for or staring at foods. The cyclical relationship between behaviour modification

and infant response was apparent in some situations, such as when fathers perceived that the infants' diet would contribute to constipation and that offering juice would resolve this issue.

### **Conceptual model**

The conceptual model, shown in Fig. 1, was created to show the relationship between the three identified themes described above. This conceptual model shows the relationship between the constructs of fathers' roles and perceptions that affect control of infant feeding habits is mitigated by interaction between behaviour modification and infant's response.

The centre of the circle represents the control of infant feeding as the convergence of the father's roles and perceptions, and being directly shaped through behaviour modification activities by the father and response of the infant. The centre circle of 'control' is not dissected by the horizontal line and represents the convergence of the father's roles and perceptions directly related to the infant and the cyclical nature of behaviour modification and infant response.

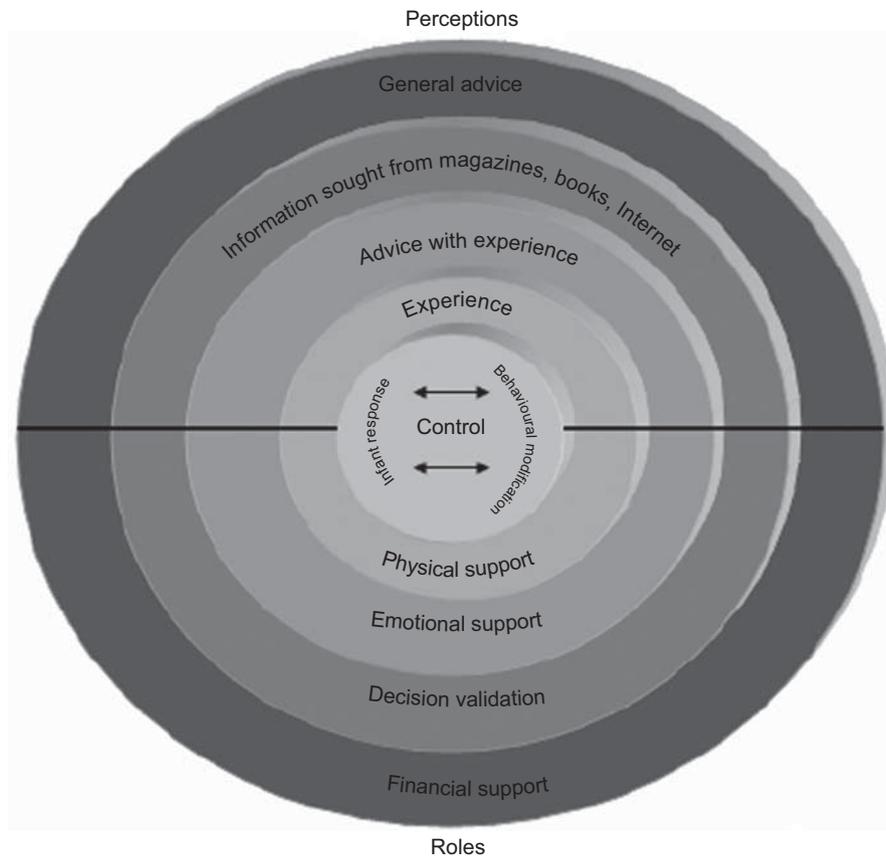
The outer layers of the model represent roles and perceptions, with distal and proximal concepts represented by distance to the infant, or centre. The lower portion of the model encompasses the main roles of the father. Layers closest to control in the centre represent the most direct roles the father plays in the infant's life. As layers get further from the centre they represent roles that are increasingly less directly associated with infant feeding and care. The upper portion of the model represents the many factors that shape the father's perceptions related to infant feeding. These layers, too, respectively show the most to least influential factor from the centre to the outermost layers.

### **Discussion**

Research has shown that fathers can have an important influence on infant feeding decisions; in particular the decision to breast- or formula-feed has been well documented<sup>(19–22)</sup>. To our knowledge little has been reported about how fathers view their role in infant feeding beyond breast- or formula-feeding. The model developed here delineates how a father may function in this role and is supported by Gavin *et al.*, who found using an ecological model that it may be possible to clarify relationship boundaries between the father and the mother and that of the father and child<sup>(28)</sup>. Therefore, our objective in the present study was to describe the roles and perceptions of low-income fathers regarding infant feeding practices.

### **Control – circle centre**

Behaviour modification activities, such as feeding cereal in the bottle to alleviate infant fussing, increase the period



**Fig. 1** Conceptual model depicting the relationship of fathers' perceptions, roles and control with regard to infant feeding

of the infant's sleep and decrease spitting-up behaviour, and solid foods to satisfy the infant's desire for these foods, are concepts supported by research with mothers<sup>(29–31)</sup>. The introduction of cereal and other solid foods earlier than medically recommended, as was found in the current study, is common practice in the USA<sup>(16,17)</sup>. These actions constitute control over behaviour modification and are represented by the control function at the centre of the circle.

#### **Roles – lower portion of circle**

Included among the roles of the father are physical and emotional support to both the mother and infant, which have been documented as perceived roles of the father in several other research studies<sup>(32–34)</sup>. A study of families using a new infant's 'system's perspective' delineated how mothers and fathers perceived their different roles. These researchers found that while fathers took a more central role in playing with the infant, the mother was more central to 'caring' for<sup>(35)</sup> and feeding the infant<sup>(36)</sup>. While there are mixed findings in the literature as to how new parents manage chores and tasks<sup>(33,35)</sup>, our study found that parents divide tasks based on who has the time and energy for them. The role of providing financial support to the family reflects that found in other literature<sup>(33,37)</sup>.

#### **Perceptions – upper portion of circle**

The present study identified a father's previous experience as the most influential factor in infant care within the theme of perceptions. Additional research similarly has identified that first-time fathers are less secure in their abilities than experienced fathers<sup>(33)</sup>. In addition, mothers have been shown to receive advice on infant feeding from family members and health-care professionals<sup>(18,19,31)</sup>, which were common sources of advice for these fathers. Several successful interventions targeting fathers have demonstrated that when fathers seek information from classes or experienced health-care professionals, their infants are more likely to be fed in accordance with infant feeding recommendations than are infants whose fathers do not seek this trusted, accurate advice<sup>(19–22)</sup>.

#### **Strengths and limitations**

There were strengths and limitations to our study. One strength was that male caregivers were interviewed directly, which research has indicated may provide more accurate data<sup>(38)</sup>. Another strength was in gaining access to fathers, who are known to be difficult to recruit<sup>(39)</sup>. Some limitations included that the sample was self-selected and that there was a wide range of ages and varying cultural backgrounds. Although this could be considered a strength, in light of the

myriad cultural-feeding practices at large, here it is seen as a limitation because it may have muddied the results<sup>(40–45)</sup>. Several male caregivers who were eligible chose not to participate or did not complete the interview process. In addition, permission to recruit via the WIC clinic was received rather late in the recruitment process. It is possible that a larger representation from male caregivers could have come from WIC and the results could have been different had recruitment started earlier. Although these results are not intended to be generalizable, due to the lack of research on the role that fathers play in early infant feeding decisions, the present study provides a first step in filling that knowledge gap. In addition, the conceptual model created may be tested, modified and ultimately used by health-care professionals to develop curricula to educate fathers of low-income infants more effectively.

## Conclusion

Fathers appear to play an important role in the lives of their infants, primarily through support of the mother, and are both directly and indirectly involved with food and fluid introduction. Although it appears that it is the mother who is ultimately responsible for making the final decisions associated with infant feeding, fathers are an important filter for information from others, as self-identified researchers regarding infant feeding recommendations and supporters of those decisions ultimately reached by the mother.

## Implications

Testing of this theory will be an important first step towards confirmation, modification and ultimate use of the theory among health-care providers. Health-care providers seeking to increase adherence of low-income parents to infant feeding recommendations may wish to use this model to assist with interpreting actions of fathers regarding infant feeding. The model will be tested through use of in-depth interviews with eligible fathers to determine development of survey questions. WIC professionals, who are familiar with fathers of their participants, could be the subject of in-depth interviews as well, to increase the validity of future survey questions. Additional fathers could then be given questionnaires to quantify their relationships to the roles of infant feeding, etc. Understanding how advice may be interpreted by low-income fathers may increase effectiveness of nutrition education. Working collaboratively to include fathers in infant feeding education may increase adherence to recommendations and increase the health of their communities.

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*contributions:* This is a publication arising from K.E.A.'s Masters thesis. With the assistance of M.S. and K.K., K.E.A. developed the research questions, performed the interviews, analysed the data and wrote up the results. J.C.N. assisted with data analysis, performing the role of coder along with K.E.A., and contributed intellectually to the analysis and theme development. M.S. contributed qualitative research expertise and assisted in the development of the research plan, analysis and model development. K.K. contributed expertise related to infant feeding and low-income populations, and assisted with development of the research plan, write-up and model development. We thank the twenty-one fathers and their families for sharing their stories and their time, and for their good humour. It is hoped that, in some small way, this work will help the research community to serve them, and all families in East Tennessee, in the years to come.

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