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Home and Videotape Intervention Delays Early Complementary Feeding Among Adolescent Mothers

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ABSTRACT. *Background.* The American Academy of Pediatrics, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and the World Health Organization recommend that infants receive only breast milk or formula for the first 4 to 6 months of life, followed by the introduction of complementary foods. Despite these recommendations, many infants, particularly those with adolescent mothers, receive solid foods (often cereal mixed with formula in a bottle) and liquids other than formula or breast milk in the first few weeks of life. Decisions on early feeding are often guided by grandmothers and influenced by beliefs that infants need complementary food to counteract signals of hunger, reduce crying, and sleep through the night.

Objective. This investigation evaluated the efficacy of an intervention to delay the early introduction of complementary feeding among first-time, black, adolescent mothers living in multigenerational households. The intervention focused on reducing the cultural barriers to the acceptance of the recommendations of the American Academy of Pediatrics, WIC, and World Health Organization on complementary feeding by highlighting 3 topics: 1) recognition of infants' cues; 2) non-food strategies for managing infant behavior; and 3) mother-grandmother negotiation strategies. The intervention was delivered through a mentorship model in which a videotape made by an advisory group of black adolescent mothers was incorporated into a home-visiting program and evaluated through a randomized, controlled trial.

Methods. One hundred eighty-one first-time, low-income, black mothers <18 years old, living in multigenerational households were recruited from 3 urban hospitals. Infants were born at term, with birth weight appropriate for gestational age and no congenital problems. Shortly after delivery, mothers and grandmothers completed a baseline assessment and mothers were randomized into an intervention or control group. Intervention group mothers received home visitation every other week for 1 year. At 3 months, a subset of 121 adolescent mothers reported on their infant's intake through a food frequency questionnaire. Mothers who fed their infant only breast milk, formula, or water were classified as optimal feeders. Mothers who provided complementary

foods other than breast milk, formula, or water were classified as less optimal feeders.

Results. Sixty-one percent of the infants received complementary foods before 3 months old. Multivariate hierarchical logistic regression was used to evaluate the determinants of being in the optimal versus less optimal feeders group. After controlling for infant age and family income, mothers of infants in the optimal feeders group were more likely to report accurate messages from WIC regarding the timing of complementary food and nearly 4 times more likely to be in the intervention group. The most common complementary food was cereal mixed with formula in the bottle.

Conclusions. The success of this relatively brief intervention demonstrates the importance of using ecological theory and ethnographic research to design interventions that enable participants to alter their behavior in the face of contradictory cultural norms. The intervention focused on interpreting infants' cues, nonfood methods of managing infant behavior, and mother-grandmother negotiations. It was delivered through methods that were familiar and acceptable to adolescent mothers—a mentorship model incorporating home visits and videotape. The skill-oriented aspects of the intervention delivered in a culturally sensitive context may have enabled the young mothers to follow the guidelines that they received from WIC and from their pediatricians. Strategies, such as those used in this intervention, may be effective in promoting other caregiving recommendations, thereby enabling providers to meet the increasing demands from parents for advice regarding children's early growth and development. *Pediatrics* 2001;107(5). URL: <http://www.pediatrics.org/cgi/content/full/107/5/e67>; *adolescent parenting, infant feeding, complementary feeding, home visiting, intervention.*

ABBREVIATIONS. AAP, American Academy of Pediatrics; WIC, Special Supplemental Nutrition Program for Women, Infants, and Children; WHO, World Health Organization.

Many families do not adhere to recommendations advanced by the American Academy of Pediatrics (AAP), the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and the World Health Organization (WHO) that infants be fed only breast milk or formula for the first 4 to 6 months of life.¹⁻⁴ Although the health consequences associated with the early introduction of complementary foods are controversial,⁵⁻⁸ there is evidence that early introduction of solid foods may increase infants' risk of enteric infections, allergic reactions, obesity, choking, and food aversion.⁹⁻¹³ Complementary foods are often high in protein, raising questions about the conse-

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quences of high protein intakes on growth and obesity.¹⁴ In addition, early complementary feeding does not increase the likelihood of nighttime sleeping¹⁵ and may increase the likelihood of feeding disorders, especially if parents introduce developmentally inappropriate food or feeding techniques before children have acquired the necessary neuromuscular skills.^{16,17}

Before the 1920s, infants were reared primarily on breast milk.¹⁸ Cereals were commonly the first foods introduced, but many infants did not receive solids until close to their first birthday.¹⁸ In the 1950s, many mothers were advised by their pediatricians to introduce solid foods early in life, often within the first few days.¹⁸ However, those recommendations were soon reversed because of concerns regarding the negative health consequences of early complementary feeding. Current guidelines from the AAP, WIC, and WHO, reflecting both the nutritional and developmental needs of infants,¹⁹ recommend that infants receive breast milk or formula with no complementary foods for the first 4 to 6 months of life, followed by the introduction of other liquids, semisolids, and solids, depending on the child's readiness.^{9,20}

Many families introduce solid foods and liquids other than breast milk or formula early in life, often within the first few weeks.^{1-4,21} Reasons for the early introduction of food suggest that big infants are considered to be healthy²² and solids are regarded as having more nutritional value and ability to satisfy infants, compared with formula.²¹ Mothers often look to their infants for cues regarding hunger and satiety and reason that with solid foods their infants will feel satisfied and will cry less and sleep through the night.²¹ Therefore, many mothers are encouraged by cultural norms transmitted through their families to start solid foods early in life, contrary to the recommendations that they may receive from WIC or from their pediatrician.

Low-income adolescent mothers are a particularly vulnerable group because they have little experience themselves and are often dependent on their mother (infant's grandmother) for guidance. The passage of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996, requiring adolescent mothers to live with a guardian to receive financial assistance,²³ increases the likelihood that adolescent mothers will raise their children in multigenerational households. Although multigenerational households are culturally acceptable in black communities²⁴ and are often beneficial to mothers and their children,²⁵ tensions are common as mothers and grandmothers struggle to define their roles in caregiving activities, such as feeding.^{24,26-29} Grandmothers play important roles in infant feeding decisions, particularly related to the early introduction of complementary foods.²¹ Thus, interventions aimed at shifting cultural patterns of early complementary feeding have to go beyond the provision of information regarding the type and timing of complementary foods for infants, as proposed by the AAP, WIC, and WHO guidelines. Not only do cultural norms promote early introduction of complementary foods as a strategy to manage infants' perceived cues of hunger, but

infant feeding decisions are often under the control of grandmothers. If adolescent mothers receive advice that is inconsistent with grandmothers' beliefs of what infants should eat, the young mothers may find themselves in the difficult position of interpreting and defending recommendations from WIC or their pediatrician. Thus, young mothers may benefit from interventions that include information about early feeding, along with strategies to interpret infant's cues, manage infant's behavior without relying on food, and negotiate with their own mother regarding infant feeding.

This investigation was undertaken to determine whether methods of intervention that have been used effectively to modify parenting behaviors among adolescent mothers in the past (ie, home-based intervention and culturally sensitive videotape)^{30,31} would be effective in promoting the adoption of AAP-recommended feeding guidelines among first-time, black, low-income, adolescent mothers. When infants were 3 months of age, we conducted a food frequency questionnaire to test the hypothesis that the adolescent mothers in the intervention group would be more likely to adhere to feeding guidelines of limiting their infants' intake to breast milk, formula, or water for the first 4 to 6 months of life, compared with mothers in the control group.

Intervention

The home-based intervention in this investigation was based on ecological theory, which posits that parenting practices are based on cultural values, maternal functioning, child functioning, and contextual sources of stress and support.^{32,33} The curriculum was developed after a review of existing parenting intervention programs and formative research among families of black adolescent mothers in the study community.^{21,34} It includes 19 topics that balance skill-building for parenting (eg, interpreting infant's cues) and adolescent development (eg, mother-grandmother negotiation strategies). Because decisions about feeding are often made by grandmothers, based on their beliefs that complementary foods reduce infants' crying and promote nighttime sleeping, the intervention was designed to include mother-grandmother negotiation strategies, communication strategies to read infants' cues, and behavioral strategies, other than feeding, to manage crying and sleeping.

The videotape was developed following principles from social cognitive theory,³⁵ including modeling, familiar contexts, and skill-oriented strategies. The videotape was specifically developed for this project by inviting the administration of a school for pregnant and parenting teens to nominate 8 young mothers whom they regarded as successful, based on their academic performance, school citizenship, and parenting behavior. Using procedures that have been effective in promoting parenting among adolescents in the past,³⁰ we conducted 4 focus groups with the adolescent mothers so that they could develop the messages that they wanted to communicate to other adolescent mothers. Filming for the 15-minute vid-

videotape was conducted in the girls' homes, school, and day care. The videotape featured adolescent mothers with their children, partners, and mothers talking about strategies to avoid mother-grandmother conflict and to promote caregiving, especially feeding.

On the first visit of the home-based intervention, the videotape was shown to each adolescent mother and she received a copy of the videotape to share and discuss with friends and family. The home visitor used the videotape to generate discussion and skill-based activities around topics of parenting and adolescent development and to introduce the topic of infant feeding.

A mentorship model was used in which the home visitors served as role models for the adolescent mothers. The 2 home visitors were college-educated black women between 23 and 28 years of age and were both mothers to young children. They had excellent communication skills, a background in human services and family-oriented programs, and a strong commitment to strength-building interventions. In addition to 40 hours of training, they received biweekly supervision.

METHODS

Participants

The participants included a subset of 121 of the 181 adolescent mothers enrolled in a longitudinal, randomized, controlled trial of home intervention designed to promote parenting and adolescent development among low-income families. Because national policies require that eligibility for public services be restricted to adolescent mothers who are in the guardianship of an adult,²³ we limited our sample to adolescent mothers who were living with their mother (grandmother of the infant). Eligibility for mothers included age <18 years at delivery, first-time delivery, black, low income (defined as eligible for WIC—family income under 185% of poverty level), and no chronic illnesses that would interfere with parenting or adolescent development. Eligibility for infants included full-term (≥ 37 weeks), birth weight appropriate for gestational age, and no congenital problems or chronic illnesses.

Procedures

Mothers were recruited from 3 urban hospitals in Baltimore, Maryland. They were approached shortly after delivery and were given a brochure explaining the longitudinal study, including the evaluation schedule and the randomization procedure used to determine intervention/control group assignment. Those who expressed interest in enrolling in the study were scheduled to receive a baseline home evaluation within 3 weeks. More than 83% of the eligible mothers agreed to participate and completed the baseline evaluation. There were no differences in maternal age or education between those who completed the baseline evaluation and those who did not.

At the baseline evaluation, all mothers and grandmothers completed consent forms approved by the institutional review boards of the University of Maryland, Baltimore, the Johns Hopkins University School of Hygiene and Mental Health, and Mercy Medical Center. In keeping with the ecological theory guiding the research, the baseline evaluation included standardized questionnaires on family demographics, personal health and mental health, mother-grandmother relationships, mother-father relationships, access to services, and early adjustment to parenting. Mothers completed the questionnaires on a laptop computer in which questions were presented aurally through headphones and visually on the screen, and responses were recorded with a mouse.³⁶ Grandmothers completed questionnaires in a face-to-face interview with a research assistant.

At the conclusion of the baseline evaluation, mothers were randomized into an intervention or control group. To ensure that the groups contained equal numbers of male and female infants

and similar distributions by maternal age, a stratified random sampling design was implemented. A random number table was used and the sample was stratified by infant gender and maternal age (≤ 15 years and 16–17 years of age). For families in the intervention group, home visits were scheduled every other week after the baseline assessment, beginning when the infants were 4 to 6 weeks of age. The visits were scheduled to continue until the infants were 12 months old. At the time of this investigation, the infants were 3 months of age and had not received >3 home visits.

For the 3-month follow-up, mothers were contacted by telephone and asked to complete a food frequency questionnaire regarding their infant's dietary patterns. The research assistant making the call was unaware whether the mothers were in the intervention or control group. When the mothers could not be contacted via telephone, the questionnaire, a stamped return envelope, and instructions were mailed to the mothers' homes. Fewer than 10% of the responses were obtained through the mail and there were no demographic differences between mothers based on method of response.

Complete data were available from 121 mothers (67% of the sample). The remaining mothers could not be reached by the time the infant was 4 months of age ($n = 39$) or the questionnaires were completed when infants were under 2 months or over 4 months old ($n = 21$). There were no differences in maternal age and education or infant birth weight and gender between families included in this phase of the study and families who were not.

Measures

Dummy variables were created for WIC advice: 1) accurate advice—breast milk, formula, or water only until 4 to 6 months of age; 2) inaccurate advice—introduction of food not restricted by infant age; and 3) no advice. Dummy variables were also created for family income: 1) <\$10 000, 2) \$10 000 to \$19 999, and 3) \geq \$20 000 and maternal education: 1) grades 7 to 9, 2) grade 10, and 3) grades 11 to 12.

A food frequency questionnaire was constructed based on an instrument used previously in this population.³ Mothers were asked about the foods that their infant had consumed over the past week, when they first introduced these foods, and factors that might have influenced their feeding behavior. Based on their adherence to the AAP, WIC, and WHO recommendations, determined by their answers to the questionnaire, we classified mothers into 1 of 2 groups: 1) optimal feeders (breast milk, formula, or water) and 2) less optimal feeders (complementary foods, including cereal, applesauce, juice, fruit, vegetables, mashed potatoes, meat, and cow's milk).

Mothers who had introduced complementary foods were asked about their decision using an open-ended probe. The reasons mothers gave for introducing complementary foods were recorded verbatim. A coding system was developed in which 7 codes represented cues based on the infant's behavior or health, 6 codes represented maternal beliefs, and 1 code represented advice from others (Table 1). The reasons were scored by 2 independent raters, with agreement >94%.

TABLE 1. Reasons for Early Introduction of Complementary Foods

Infant codes
Infant shows signs of hunger (eg, drinks vigorously)
Infant's size—thin, small
To help infant sleep better
Infant cries or is irritable
To improve infant's health (prevent illness)
Infant signals a disinterest in breast milk or formula
Infant signals an interest in food
Maternal belief codes
Lack of confidence in formula
Complementary food cleans infant's mouth from formula
Based on the weather (eg, heat), infant needs complementary foods
Mother wants to try something new
Infants of this age need water/food or ready for food
Mother not producing enough milk
Advice from others
Others recommend giving water/solid foods

Analysis

Optimal feeders were compared with less optimal feeders by examining demographic characteristics, reports of WIC messages, and home intervention status using *SPSS, Version 10.0* (SPSS, Chicago, IL). Bivariate relationships were analyzed using Student's *t* tests for continuous variables and χ^2 tests for categorical variables. Significance was set at the .05 level of probability. A multivariate analysis was conducted by using hierarchical logistic regression to examine the effects of intervention status on feeding group, after adjusting for covariates and WIC advice.

RESULTS

Mothers were a mean age of 16.3 years at the time of delivery (Table 2). Most were in school and 9% maintained a paying job outside the home. Consistent with recruitment criteria, income was reported to be low, with 41% residing in a household with an income under \$10 000. Infants averaged 3096 g at birth and 3.0 months old when the food frequency was administered.

When asked to report the messages that they received from WIC providers about the timing of introduction of complementary foods, half of the mothers (50%) cited accurate messages from WIC (no complementary foods until 4–6 months old), one third (34%) indicated that they had not received any information from WIC regarding the introduction of complementary foods, and the remaining (15%) reported that WIC endorsed early introduction of complementary foods. Slightly more than one fifth of the adolescent mothers (22%) reported that they had breastfed their infants at least once, and 13% were breastfeeding at the time of the food frequency questionnaire, in combination with formula feeding. Mothers reported giving their infants a range of foods other than breast milk, formula, or water (Fig 1). Cereal mixed with formula in a bottle was the most common supplementary food, fed to 49% of the

infants. More than one fifth had received cereal with a spoon (22%) or applesauce (21%). None had fed honey or eggs. Approximately one third of the mothers (34%) were classified as optimal feeders. When the definition of optimal feeders was expanded to include water with sugar, 47 mothers (39%) met criteria and 74 mothers (61%) were classified as less optimal feeders.

Bivariate comparisons revealed that mothers in the optimal feeders group had a younger child ($P < .03$) and were more likely to report a family income above \$20 000 ($P = .02$), to report accurate advice from WIC (no complementary foods before 4–6 months; $P = .005$), and to be in the intervention group ($P = .005$). There were no differences in maternal age, education, employment status, or feeding history, or in infant birth weight or gender.

A hierarchical logistic regression model was calculated, controlling for 2 child characteristics (birth weight and gender) and 5 maternal characteristics (age at delivery, education, income, employment, and breastfeeding history). Control variables were removed if they were not significant. When WIC advice and intervention status were added to the model, there were 4 significant predictors of optimal feeding: 1) younger infants; 2) higher household income; 3) ability to report accurate WIC messages (no complementary foods before 4–6 months); and 4) intervention group member (Table 3). Mothers in the intervention were nearly 4 times more likely to adhere to AAP guidelines, compared with mothers in the control group.

Mothers were asked about the timing of the introduction of complementary foods. Cereal in the bottle was introduced as early as 2 weeks of age by 1 mother in the control group. With the exception of 3

TABLE 2. Sample Characteristics

	Intervention Group <i>n</i> = 58	Control Group <i>n</i> = 63
Mother		
Age at delivery: mean y (SD)	16.4 (0.9)	16.2 (0.9)
Education: <i>n</i> (%)		
Grades 7–9	15 (25.9)	16 (25.4)
Grade 10	15 (25.9)	25 (39.7)
Grades 11–12	28 (48.2)	22 (34.9)
Paid job outside home: <i>n</i> (%)	5 (8.6)	6 (9.5)
Yearly family income: <i>n</i> (%)		
<\$10 000	23 (39.7)	27 (42.9)
\$10 000–\$19 999	22 (37.9)	17 (27.0)
>\$20 000	13 (22.4)	19 (30.2)
Advice from WIC: <i>n</i> (%)		
Accurate: no solids <4–6 mo of age	32 (57.1)	27 (44.3)
Inaccurate: solids <4–6 mo of age	18 (32.1)	22 (36.1)
No information on timing	6 (10.7)	12 (19.7)
Optimal feeder: <i>n</i> (%)	30 (51.7)	17 (27.0)*
Breastfeed ever: <i>n</i> (%)	13 (22.8)	14 (22.2)
Breastfeed at 3 mo of age: <i>n</i> (%)	7 (12.3)	9 (14.3)
Infant		
Age at questionnaire: mean in mo (SD)	3.0 (0.5)	3.0 (0.5)
Birth weight: mean in g (SD)	3099.8 (417.2)	3092.8 (407.3)
Gender		
Female: <i>n</i> (%)	31 (53.4)	32 (50.8)
Male: <i>n</i> (%)	27 (46.6)	31 (49.2)

* $P < .011$.

SD indicates standard deviation.

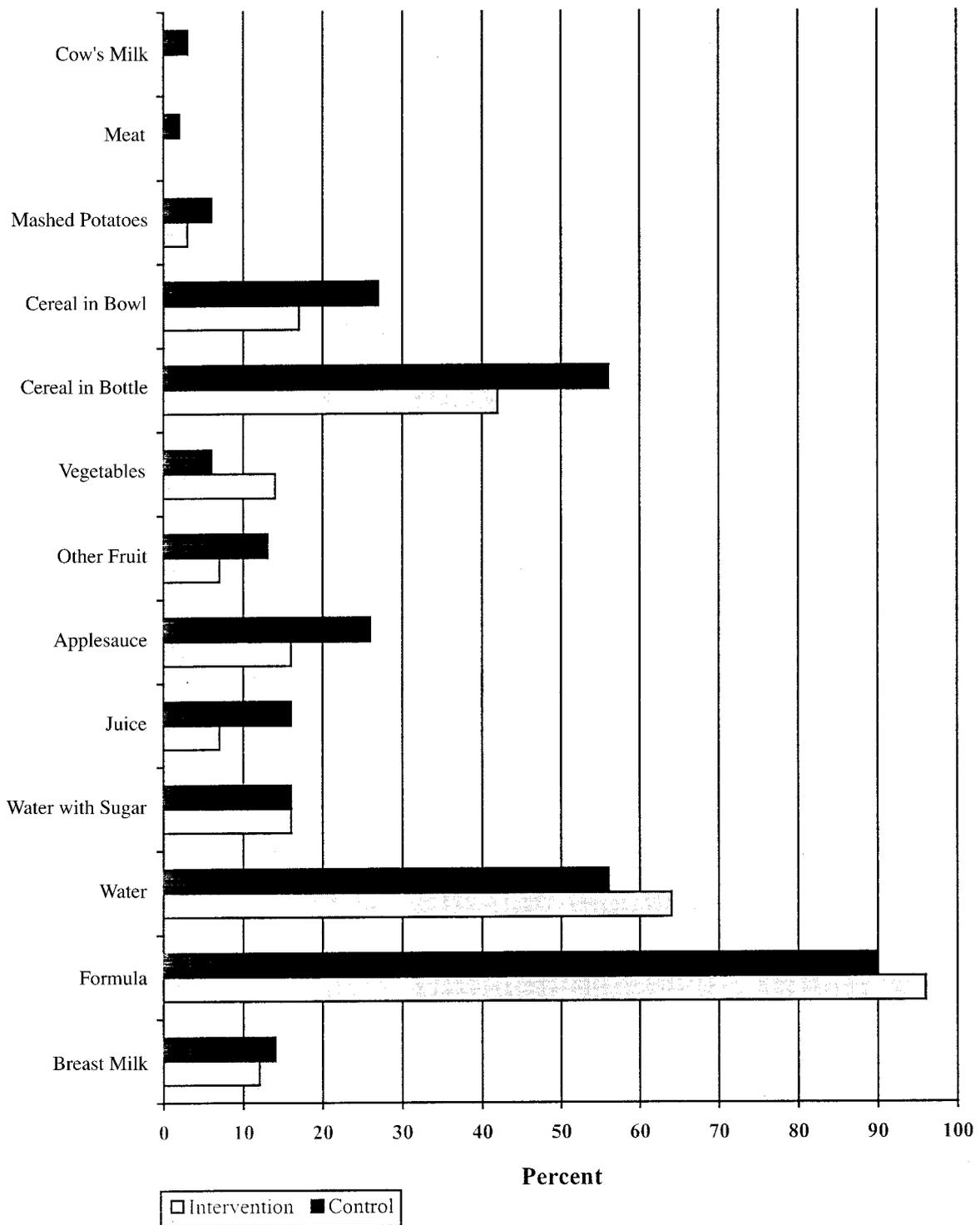


Fig 1. Introduction of complementary foods.

mothers in the control group (19%) who introduced applesauce at 4 weeks of age, mothers did not introduce solid foods that required spoon feeding (fruit, vegetables, mashed potatoes, or cereal in a bowl) until the infants were 8 weeks of age.

When the reasons for introducing complementary foods were analyzed, half of the mothers (50%) reported that their decision was based on infant cues (eg, "he wasn't getting full," "she didn't seem satisfied by the milk"). One third (31%) did not mention

TABLE 3. Determinants of Optimal Feeding

	Odds Ratio	(95% Confidence Interval)
Age of infant	0.3	(0.1, 0.7)*
Yearly family income (>\$20 000)	3.2	(1.2, 8.3)†
Accurate WIC advice	3.2	(1.3, 7.5)*
Intervention group	3.8	(1.6, 9.1)*

* $P < .01$.

† $P < .05$.

infant cues but reported on their own beliefs regarding feeding (“I wanted her to taste it,” “just to try it,” “I felt like it was time”). Approximately 19% reported that they introduced solid foods on the advice of others or external conditions (eg, “my mom told me to give her cereal,” “my grandmother suggested that she start eating soft food like mashed potatoes,” “it was too hot to drink milk”).

DISCUSSION

This study reports on the efficacy of a brief home and videotape intervention to delay the early introduction of complementary foods among black adolescent mothers. The intervention specifically targets the cultural barriers that interfere with mothers’ acceptance of AAP, WIC, and WHO guidelines. In addition to messages about the type and timing of infant feeding, the intervention showed mothers how to read their infants’ cues, provided nonfood strategies for managing infants’ behavior, and addressed mother–grandmother negotiations regarding feeding. To our knowledge, this is the first time a home intervention has achieved behavior change related to infant feeding. These findings are encouraging because they suggest that brief interventions, targeted specifically to the intended population, can be effective in overcoming barriers established by cultural norms that transcend 2 generations.

Possible Explanations for Intervention Success

There are at least 4 possible reasons for the success of this intervention. First, the intervention was guided by ecological theory in which infants play an active role in the caregiving process. The data presented here and elsewhere^{21,22} suggest that infant characteristics (eg, size), infant behavior (eg, signals of hunger or satiety), and caregiver concerns about infants not sleeping through the night or crying are salient cultural issues that need to be addressed in educational messages. This study has reiterated the strong cultural norms and ethnotheories related to infant feeding practice in this population.²¹ Consistent with data from other sources,^{3,22} the introduction of complementary foods was early relative to AAP, WIC, and WHO guidelines. Two thirds of mothers introduced nonbreastmilk or formula foods/drinks before 3 months of age, often in response to perceived signals of hunger from their infants. By participating in an intervention that focused on interpreting infants’ cues, mothers may have been able to resist the cultural norm of using complementary food to manage their infant’s crying and sleeping behavior.

Second, both the videotape and the home-visiting curriculum extended the focus on infant feeding to include mother–grandmother negotiation skills. Our ethnographic research illustrated that although many young mothers knew that they should not offer complementary food for the first 4 to 6 months of life, they were often powerless to resist the pressure of their mothers.²¹ In other words, the young mothers who participated in the intervention may have been able to defy the cultural bias toward the early introduction of complementary foods because

they were able to interpret their infants’ cues and to negotiate with their own mothers regarding strategies other than giving complementary foods.

A third possible explanation for success may be the cultural sensitivity of the methods used to implement the intervention. Previous research has shown the effectiveness of home-visiting curricula and videotapes in modifying caregiving behavior among adolescent mothers.^{30,31} This intervention extended those findings by integrating a videotape into the home intervention and focusing on the social context of adolescent mothers. Although home-visiting interventions have attracted a great deal of enthusiasm,^{37,38} home visiting merely describes the venue. The success of home-visiting interventions is tied to the strength of the underlying theory, the comprehensiveness and cultural sensitivity of the curriculum, the therapeutic skills of the home visitor, the supervision provided to the home visitor, and the rigor of the evaluation.³⁸ By featuring adolescent mothers, fathers, and grandmothers in the videotape and by conducting the intervention in the home, we attempted to make the intervention culturally acceptable so that other family members would recognize the important role that they play in supporting the adolescent mother and child. Both the videotape and the intervention relied on principles of social cognitive theory, particularly modeling and skill building. The videotape served as a stimulus for discussion, supplemented by sessions of the home-based curriculum that stressed parent–infant communication, strategies for managing infant behavior, and negotiation skills that adolescent mothers could use in decision-making situations with their own mothers.

Finally, the mentorship model may have contributed to the success of the intervention. Our goal was to help adolescent mothers build on their strengths, as they learned to balance the challenges of both parenthood and adolescent development. In the mentorship model, home visitors were viewed as older sisters. Consistent with the principles from social cognitive theory,³⁵ they introduced skill-building activities, served as role models, and provided feedback to the adolescent mothers in a supportive context. In the case of infant feeding, their role was to highlight the recommendations provided by WIC and the pediatrician and to help mothers determine why and how they would follow the recommendations.

Limitations

There are several methodologic limitations that should be addressed. First, results are specific to young black mothers living in multigenerational households. However, the participants were recruited at delivery and should be representative of low-income, adolescent mothers, particularly with the recent legislation regarding the need to live with a guardian to obtain public assistance.²³

The families in the intervention received both the videotape and the home-visiting curriculum. Therefore, it is impossible to assess the unique contribution of each component of the intervention. However, previous investigations with low-income,

adolescent mothers have shown the efficacy of both a culturally sensitive videotape³⁰ and a home-visiting program³¹ in promoting maternal parenting skills. Pairing a videotape intervention with a home intervention targeted to the specific needs of individual mothers is likely to be more effective than either component alone.

Finally, it is possible that the positive findings are the result of generalized attention from the home visitor, rather than the specific intervention. Subsequent studies that include an attention control are necessary to determine the relative contributions of the attention from the home visitor and the intervention curriculum.

Role of WIC

The findings also explore the role of the WIC provider in influencing infant feeding practices. When the infants were 3 months of age, only half of the mothers could report an accurate message from WIC regarding the appropriate timing of complementary foods. The other half reported receiving either no information or inaccurate information that endorsed the early introduction of solid foods. There is clear evidence that the Maryland State WIC program uses educational materials that reinforce the message to delay the introduction of solids until after 4 months old.³ It is likely that many mothers shape their perceptions about what they hear to conform to the cultural norm of early supplementation. Although WIC did make a positive difference for many of the mothers in our sample, WIC providers may enhance their effectiveness by adopting more active interventions that enable mothers to overcome the cultural barriers that interfere with their implementation of the AAP, WIC, and WHO recommendations regarding the timing of complementary feeding.

Implications for Practice

These findings illustrate the benefits of interventions that extend beyond information on feeding to include culturally sensitive messages that address the specific barriers identified by adolescent mothers and their families and are delivered through methods that are effective with young mothers—mentors providing messages through home visits and videotapes. The barriers to the AAP, WIC, and WHO recommendations for infant feeding would not have been identified without adopting an ecological model and ethnographic research that focused on the social context of children and families.

The success of this relatively brief intervention demonstrates the importance of designing culturally sensitive interventions that enable participants to overcome the barriers associated with cultural norms. Although many of the mothers reported receiving advice from WIC and their pediatrician regarding the introduction of complementary foods, they were much more likely to follow the guidelines when they received the support of a mentor and information on interpreting their infants cues, non-food-related alternatives to managing infant behavior, and mother-grandmother negotiation skills. Thus, recommendations on feeding practices should

be expanded to address contextual issues, including strategies for managing infant crying and sleeping patterns and negotiating with other household caregivers. Brief culturally sensitive interventions, implemented through primary care settings before problems have been identified, may be effective in promoting other caregiving recommendations. Such programs would enable providers to meet the increasing demands from parents for advice regarding children's early growth and development³⁹ and to prevent more serious physical, developmental, and behavioral problems.

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