Strategies to Promote Breast-feeding Among Adolescent Mothers

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Objective: To identify characteristics of adolescent mothers who bottle-feed who considered breast-feeding their infants and strategies to promote breast-feeding within this special group.

Design: Adolescents completed an hour-long interview within 48 hours of delivery that elicited factors considered important to the mother’s feeding decision and indices of mental health.

Setting: Postpartum ward of university hospital.

Subjects: A total of 693 adolescents 18 years old or younger (mean age, 16.7 years) from African American, Mexican American, or white race or ethnicity; 27% of Mexican American participants spoke little or no English.

Main Outcome Measures: Factors associated with breast-feeding decision.

Results: Those who chose bottle-feeding (hereafter, bottle-feeders) who had considered breast-feeding were first compared with bottle-feeders who had not considered breast-feeding and then with adolescents who breast-fed. After controlling for ethnicity, bottle-feeders who had considered breast-feeding were more likely than those who had not considered breast-feeding to be impoverished (adjusted odds ratio [AOR] = 4.8), to have delayed their feeding decision until the later stages of pregnancy (AOR = 4.6), to have been encouraged to breast-feed (AOR = 4.5), to have friends who breast-fed (AOR = 4.3), and to have experienced low financial, tangible, emotional, or informational support from their families (AOR = 1.6). They were more likely to cite barriers associated with breast-feeding while returning to school or work (AOR = 2.0) and less likely to state that bottle-feeding was healthier (AOR = 0.3) as reasons for bottle-feeding. Compared with those who chose breast-feeding (hereafter, breast-feeders), this group was more likely to have made the feeding decision alone rather than relying on advice (AOR = 4.6), to have made this decision in the later stages of pregnancy (AOR = 4.4), to report fewer breast-feeding role models (AOR = 1.8) and fewer significant others who encouraged breast-feeding (AOR = 2.8), and to report at least 2 significant others who encouraged bottle-feeding (AOR = 3.2). They were also less likely to have attempted to breast-feed a previous child (AOR = 3.3).

Conclusions: A subgroup of adolescent mothers who had considered breast-feeding but ultimately chose to bottle-feed may be identified in the late stages of gestation by collecting information on financial status, family support, perceived barriers to breast-feeding and attending school or working, timing of the feeding decision, prior breast-feeding experience, breast-feeding role models, and encouragement to breast-feed. We speculate that strategies to promote breast-feeding should focus on role modeling and facilitation.


Editor’s Note: This study provides interesting data that just might get adolescent (and other?) mothers to feed their infants the milk of human kindness and then some.

Catherine D. DeAngelis, MD

Despite documented benefits of breast-feeding\(^1\)\(^2\) and the Public Health Service goal of having 75% of all newborns breast-fed by the year 2000,\(^7\) many adolescent mothers continue to bottle-feed their infants.\(^9\)\(^5\) Although our previous investigation of infant feeding revealed that factors associated with breast-feeding among adolescent mothers differed by ethnicity, perceived advantages and disadvantages of feeding methods remain important predictors of infant feeding choice across all ethnic groups.\(^6\)\(^8\) Additional correlates of the choice to breast-feed among pregnant adolescents found in this and other studies include being white or Spanish-speaking as compared with African American,\(^6\)\(^7\)\(^10\) older maternal age, being married,\(^10\)\(^11\) not living in the same household with her own mother,\(^6\)\(^10\) having been breast-fed themselves and having known or observed breast-feeding women,\(^11\) and exposure to infant-feeding educational materials.\(^6\)

Studies of nonpregnant high school students suggest that attitudes toward infant-feeding methods begin to form well.
SUBJECTS AND METHODS

SUBJECTS

All adolescents 18 years of age and younger who were delivered of infants at our institution between June 1, 1994, and February 28, 1996, were eligible to participate if they met the following criteria: self-reported Mexican American, African American, or white race or ethnicity; plan to retain custody of their baby; ability to read and write at a fifth-grade level in English or Spanish; absence of major psychiatric disorders; and delivered of a healthy infant weighing more than 1500 g. There were 786 adolescents who were delivered of an infant during the study period and were eligible to participate. Of these, 20 adolescents were not approached to participate because of a large number of births on the day that their child was delivered. Of the 766 adolescents invited to participate, 70 (9%) refused. The most common reason given for declining was not having enough time to complete the hour-long interview. Therefore, the study sample included 693 adolescents, 273 of whom were Mexican American, 212 were African American, and 208 were white.

Details on the sample used for this study, the method of subject recruitment, and variable definitions are presented elsewhere. All subjects were interviewed within 48 hours of the delivery of their newborn while on the postpartum ward. The interview elicited demographic characteristics, factors considered important to the mother's infant-feeding decision, and indices of mental health. Mental health indices included self-efficacy, family support, social stigmatization associated with being pregnant as an adolescent, and substance use during pregnancy and in the 3 months prior to conception. The Rosenberg Self-Efficacy Scale, which has been used extensively in research with adolescent parents, was used to measure self-efficacy. Measures of family support and stigmatization were derived from the previous research of one of us (C.M.W.) on adolescent mothers. Family support was defined as being able to rely on members of one's nuclear or extended family for financial, tangible, emotional, and informational assistance. Stigmatization was assessed by asking patients the extent to which they agreed with a series of 6 statements such as “I seriously thought of having an abortion so that no one would know I was pregnant” or “I worried about what others thought of me when I was pregnant.”

In this study, measures of internal consistency (Cronbach α) for the family support and stigmatization variables were .81 and .62, respectively. We determined substance use before pregnancy and the use of tobacco and alcohol during pregnancy by self-report, whereas we identified illicit drug use (cocaïne, opiates, cannabinoids) during pregnancy by self-report and results of urine drug screens.

Reasons for the bottle-feeding choice were evaluated using a series of 20 items that required each mother to indicate aspects of infant feeding most important to her decision. Factor analysis of responses to this set of questions was used to reduce the number of variables entered in later analyses. Principal components extraction and varimax rotation were used to identify 3 composite factors that measure (1) the perceived physical discomforts and concerns about dietary or substance use restrictions associated with breast-feeding (6 items; Cronbach α = .75); (2) the concerns about the mother or baby becoming fat if the patient breast-fed (4 items; Cronbach α = .69); and (3) the relative influence of the feeding preference of the patient’s mother or grandmother, partner, and health care provider (physician, nurse) (3 items; Cronbach α = .75). Seven remaining questions that failed to load on any composite factor were evaluated individually.

We also asked patients to indicate when they made the infant-feeding decision (before pregnancy, in early stages of pregnancy, in late stages of pregnancy, or in the hospital following the delivery), and whose advice, if any, was most important. We assessed exposure to breast-feeding role models by identifying members of each teen’s support network who had breast-fed. We treated total scores on family support, self-efficacy, and stigmatization measures as continuous variables.

STATISTICAL ANALYSES

For purposes of analyses, we divided patients into 3 groups: (1) adolescent bottle-feeders who had considered breast-feeding; (2) adolescent bottle-feeders who had not considered breast-feeding; and (3) adolescent breast-feeders. We then used χ² tests to compare bottle-feeders who had considered breast-feeding with adolescents from each of the other 2 groups on demographic and reproductive characteristics, social influences on the infant-feeding decision, and the use of tobacco, alcohol, or illicit drugs during pregnancy and in the 3 months prior to conception. Student t and χ² tests were also used to compare bottle-feeders who had and had not considered breast-feeding with reasons for their infant-feeding choice. To control for type I error, we employed analysis of variance to simultaneously compare all 3 groups on continuous measures (age, education level, and mental health indices). These continuous variable distributions were first evaluated for assumptions of normality and homogeneity of variance. We used the Scheffe test to isolate groups that differed significantly.

We used stepwise logistic regression analyses to identify factors independently associated with the decision to bottle-feed or breast-feed. Correlates of having considered breast-feeding (P ≤ .10) identified in the bivariate analyses were targeted for entry into the regression models. Patient ethnicity was first entered in these analyses to control for this potential confounding effect. Again, we conducted 2 sets of analyses comparing bottle-feeders who had considered breast-feeding with (1) bottle-feeders who had not considered breast-feeding and (2) breast-feeders. High colinearity was evaluated by examining correlations among independent variables. We separately examined the individual contributions of highly correlated variables to the logistic regression model by adding and removing each in subsequent analyses.

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adolescents do not make their infant-feeding decision until the middle-to-late stages of gestation, the prenatal period may be an optimal time for focused interventions to promote breast-feeding. Unfortunately, few evaluations of interventions designed to increase the initiation of breast-feeding in this special population have been reported.14,15

Although more pregnant adolescents choose to bottle-feed (hereafter, bottle-feeders) instead of breast-feed (hereafter, breast-feeders) their babies,6,7,16,17 a significant number of teenage bottle-feeders remain undecided up to the point of delivery of their child. In an age of shrinking dollars for patient education, it makes sense to target intervention resources toward pregnant adolescents who would be most susceptible to breast-feeding interventions, such as bottle-feeders who are still either undecided about their infant-feeding method or less certain of their feeding decision. However, designing effective interventions requires identifying and understanding this special subgroup of adolescent mothers, compared with those who never considered breast-feeding and those who have chosen to breast-feed.

The purpose of this study was to extend our previous investigation of breast-feeding in a large, triethnic sample of adolescent mothers by identifying characteristics of adolescent bottle-feeders who would have been amenable to breast-feeding intervention in the late stages of gestation. This was accomplished by first comparing adolescent bottle-feeders who had considered breast-feeding with those who had never considered breast-feeding and then with adolescents who chose to breast-feed. Comparisons included social influences on the infant-feeding decision, indices of mental health, reasons for bottle-feeding choice, and the timing and certainty of the infant-feeding decision. Because our prior investigation demonstrated that factors associated with breast-feeding differed by patient ethnicity,6 this variable was controlled in multivariate analyses. The role of harmful substance use in the feeding decision was evaluated because 1 in 2 adolescents previously reported that they chose to bottle-feed because of concerns that they could not smoke, drink alcohol, or use street drugs while breast-feeding.6 An ultimate goal of the study was to use this information to design effective strategies to promote breast-feeding within this special group.

RESULTS

Adolescents in the sample averaged 16.7 years of age and had completed 9.5 years of education. Nearly one half of the adolescents were enrolled in school at the time of the delivery of their baby, and one third planned to return to school within 6 weeks. Within the group, 14% (97) reported inadequate financial resources and 80% (554) were enrolled in the Women, Infants, and Children’s Supplemental Nutrition Program (WIC). Few (2% [14]) adolescents lived by themselves, while 50% (347) were living with at least an older woman (mother, aunt, grandmother), 19% (132) were living with at least an older man (father, stepfather, grandfather), 39% (270) were living with at least a male partner, and 9% (62) lived with at least the parents of their current partner. For 83% (575) of the adolescents interviewed, this was the first child they were delivered of. Nearly all (98% [674]) adolescents sampled had accessed prenatal care.

Overall, 419 (60%) adolescents chose to bottle-feed, while 274 (40%) chose to breast-feed. Of those who chose to bottle-feed, 175 (42%) reported having considered breast-feeding, while 244 (58%) did not.

Comparisons of demographic and reproductive characteristics identified more differences between bottle-feeders who had considered breast-feeding and breast-feeding...
feeders, than between groups of bottle-feeders. Bottle-feeders who had considered breast-feeding were evenly distributed among the 3 ethnic groups. However, bottle-feeders who had never considered breast-feeding were least likely to be Mexican American and most likely to be African American, while breast-feeders were least likely to be African American and most likely to be Mexican American. Bottle-feeders who had considered breast-feeding were more likely than other bottle-feeders, but less likely than breast-feeders, to be living with a male partner. They were also less likely than breast-feeders to have attempted to breast-feed a previous child. No significant differences were observed between any groups on the variables of age, education level, mother’s education level, and cesarean delivery.

Next, we evaluated social influences on the infant-feeding decision between groups. The advice of significant others was more important in distinguishing between bottle-feeders who had considered breast-feeding and breast-feeders than between the bottle-feeding groups. A pattern emerged wherein bottle-feeders who had considered breast-feeding were more likely than other bottle-feeders and less likely than those who chose to breast-feed to report breast-feeding role models and encouragement to breast-feed from significant others. Similarly, having been encouraged to bottle-feed by 2 or more people was reported most often by bottle-feeders who had not considered breast-feeding and least often by breast-feeders.

Adolescent bottle-feeders who had considered breast-feeding were significantly more likely than either other group to make their feeding decision in the later stages of pregnancy or following the delivery of their child and were least likely to be very sure of the decision once made (Table 2). In fact, 25% (44) of bottle-feeders who had considered breast-feeding waited until after the delivery to make this decision as compared with 5% (12) of other bottle-feeders (P<.001) and 6% (16) of breast-feeders (P<.001).

Comparison of mental health factors revealed that bottle-feeders who had considered breast-feeding reported lower levels of family support than bottle-feeders who had never considered breast-feeding (Table 3). When compared with breast-feeders, bottle-feeders who had considered breast-feeding experienced higher levels of stigmatization associated with being pregnant as an adolescent. The use of tobacco, alcohol, or marijuana during pregnancy and the use of tobacco or marijuana during the 3 months before conception did not differentiate any of the groups compared (data not shown). However, use of alcohol during the 3 months prior to conception was reported more often by bottle-feeders who had considered breast-feeding (50% [88]) compared with other bottle-feeders (38% [93]) (P<.05) and breast-feeders (40% [110]) (P<.05).

When reasons for choosing to bottle-feed were compared between the 2 bottle-feeding groups, several significant differences emerged (Figure). Bottle-feeders who had considered breast-feeding were less likely than other bottle-feeders to choose to bottle-feed because of a belief that formula is healthier for their baby, that breast-feeding is more convenient than breast-feeding, that breast-feeding will cause their breasts to sag, or that breast-feeding is old fashioned. This group was, however, more likely to report that they had chosen to bottle-feed because breast-feeding would make it more difficult to return to school or work. No differences were noted between groups of bottle-feeders on the following reasons for their choice of bottle-feeding: perceived physical dis-

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**Table 2. Influences on the Infant-Feeding Decision**

<table>
<thead>
<tr>
<th>Influences</th>
<th>Considered Breast-feeding (n = 175)</th>
<th>Never Considered Breast-feeding (n = 244)</th>
<th>Breast-feeders (n = 274)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whose advice most important</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No one</td>
<td>108 (62)</td>
<td>169 (69)</td>
<td>87 (32)†</td>
</tr>
<tr>
<td>Mother</td>
<td>41 (23)</td>
<td>48 (20)</td>
<td>75 (28)</td>
</tr>
<tr>
<td>Partner</td>
<td>9 (5)</td>
<td>4 (2)</td>
<td>9 (4)</td>
</tr>
<tr>
<td>Physician/nurse</td>
<td>8 (5)</td>
<td>8 (3)</td>
<td>60 (22)†</td>
</tr>
<tr>
<td>Friend</td>
<td>4 (2)</td>
<td>5 (2)</td>
<td>19 (7)††</td>
</tr>
<tr>
<td>Breast-feeding role models</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>33 (19)</td>
<td>104 (43)†</td>
<td>23 (8)†</td>
</tr>
<tr>
<td>2 or more</td>
<td>49 (28)</td>
<td>34 (14)††</td>
<td>150 (56)†</td>
</tr>
<tr>
<td>2 Significant others encouraged</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottle-feeding</td>
<td>51 (29)</td>
<td>98 (40)††</td>
<td>27 (10)†</td>
</tr>
<tr>
<td>Breast-feeding</td>
<td>78 (45)</td>
<td>33 (14)††</td>
<td>208 (76)†</td>
</tr>
<tr>
<td>Timing and certainty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decided later in pregnancy</td>
<td>120 (69)</td>
<td>78 (32)</td>
<td>125 (46)†</td>
</tr>
<tr>
<td>Very certain of decision</td>
<td>92 (53)</td>
<td>174 (72)</td>
<td>164 (61)</td>
</tr>
</tbody>
</table>

* Bottle-feeders (those who bottle-fed) who considered breast-feeding were compared separately from those who bottle-fed who never considered breast-feeding and breast-feeders (those who breast-fed). All values are expressed as number (percentage).

†P<.001.
‡P<.05.
§P<.01.
comforts and concerns about dietary or substance-use restrictions associated with breast-feeding; concerns that the mother or baby would become fat if the infant was breast-fed; the feeding preference of the adolescent’s mother or grandmother, partner, and health care provider; or concerns about not being able to learn to breast-feed or produce enough breast milk to do so successfully.

Stepwise logistic regression analyses were first used to identify unique characteristics of the 2 groups of bottle-feeders. After controlling for race or ethnicity, bottle-feeders who had considered breast-feeding were more likely to be impoverished (adjusted odds ratio [AOR] = 4.8), to have delayed their infant-feeding decision until the later stages of their pregnancy or following the delivery of the baby (AOR = 4.6), to have been encouraged to breast-feed by 2 or more significant others (AOR = 4.5), to have friends who breast-fed (AOR = 2.3), and to experience low family support (AOR = 1.6) (Table 4). These adolescents were more likely to cite barriers associated with breast-feeding while returning to school or work as a major reason for their choice of bottle-feeding (AOR = 2.0), and they were less likely to state that they chose to bottle-feed because it was healthier for their infant (AOR = 0.3).

A second set of logistic regression analyses, also controlling for ethnicity, was performed to identify unique factors that differentiated adolescent bottle-feeders who had considered breast-feeding from adolescents who ultimately chose to breast-feed. The bottle-feeders were more likely to have made the feeding decision alone rather than relying on the advice of significant others (AOR = 4.6), to have made this decision in the later stages of pregnancy or following the baby’s delivery (AOR = 4.4), to report fewer than 2 breast-feeding role models (AOR = 1.8), fewer than 2 significant others who encouraged breast-feeding (AOR = 2.8), and 2 or more significant others who encouraged bottle-feeding (AOR = 3.2) (Table 5). They were also less likely to have attempted to breast-feed a previous child (AOR = 3.3).

This study demonstrates that during pregnancy a significant percentage (42% [175]) of adolescents who ultimately decide to bottle-feed their infants consider breast-feeding an option. Furthermore, these adolescents frequently make up their mind in the later stages of pregnancy: more than 40% of this group (n = 70) of bottle-feeders made their infant-feeding decision in the middle-to-late stages of pregnancy, while 23% (n = 44) waited until the infant’s delivery to decide. Most of the adolescents from the other 2 groups made their decision before pregnancy or in the early stages of pregnancy. These findings suggest that a significant number of adolescent

Table 3. Mental Health Factors Associated With the Infant-Feeding Decision*

<table>
<thead>
<tr>
<th>Factors</th>
<th>Considered Breast-feeding (n = 175)</th>
<th>Never Considered Breast-feeding (n = 244)</th>
<th>Those Who Breast-fed (n = 274)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family support</td>
<td>20.6 ± 4.4†</td>
<td>21.8 ± 3.5‡</td>
<td>20.0 ± 4.5†</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>32.2 ± 5.0</td>
<td>33.3 ± 4.6‡</td>
<td>31.7 ± 4.7†</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Stigmatization</td>
<td>13.0 ± 3.1†</td>
<td>12.5 ± 3.4</td>
<td>12.2 ± 3.0‡</td>
<td>.03</td>
</tr>
</tbody>
</table>

*Possible range of scores: family support, 5 to 25; self-efficacy, 10 to 24; stigmatization, 6 to 24. High scores indicate high value of each factor. Values are expressed as mean ± SD. Bottle-feeders are those who bottle-fed; breast-feeders, who breast-fed.

†Significant differences are indicated by group means with unlike footnote symbols (dagger and double dagger).

Table 4. Factors Associated With Decision to Breast-feed in Logistic Regression Model: Bottle-feeders Who Had Considered Breast-feeding vs Bottle-feeders Who Had Never Considered Breast-feeding*

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Adjusted Odds Ratio† (95% Confidence Limits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity</td>
<td>4.8 (2.1, 10.9)</td>
</tr>
<tr>
<td>Social Influences</td>
<td></td>
</tr>
<tr>
<td>Delayed breast-feeding</td>
<td>4.6 (2.8, 7.7)</td>
</tr>
<tr>
<td>Friends breast-fed</td>
<td>2.3 (1.2, 4.2)</td>
</tr>
<tr>
<td>Low family support</td>
<td>1.6 (1.1, 2.2)</td>
</tr>
<tr>
<td>≥2 Others encouraged breast-feeding</td>
<td>4.5 (2.6, 7.7)</td>
</tr>
<tr>
<td>Reasons for bottle-feeding</td>
<td></td>
</tr>
<tr>
<td>Formula is healthier than breast milk</td>
<td>0.3 (0.1, 0.5)</td>
</tr>
<tr>
<td>Cannot breast-feed and attend school or work</td>
<td>2.0 (1.2, 3.5)</td>
</tr>
</tbody>
</table>

*Ethnicity was entered first in stepwise logistic regression analyses. Odds ratios are adjusted for ethnicity and all other variables listed.

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mothers may be responsive to prenatal interventions to promote breast-feeding. Moreover, information on financial status, family support, timing of the infant-feeding decision, prior breast-feeding experience, breast-feeding role models (including peers), method of feeding encouraged by significant others, and reasons for wanting to bottle-feed may be used in the later stages of pregnancy to easily identify these adolescents and target them for interventions.

The pattern of results found in this study demonstrates that relative to other bottle-feeders, adolescent bottle-feeders who had considered breast-feeding received a significant amount of encouragement to breast-feed. Within this special group, perceived barriers, rather than lack of information, were the most important obstacles to breast-feeding. For example, bottle-feeders who had considered breast-feeding cited problems with breast-feeding while attending school or working as an important reason for choosing to bottle-feed; they were less concerned with beliefs that breast-feeding is old fashioned or would cause breast disfigurement, or that formula is tantamount to making it possible. Discussion of practical strategies such as the use of a breast pump to extract breast milk when away from the baby, arranging to leave work or school during the day to nurse, and ways to schedule feedings to maximize the number of breast-feeding opportunities may help adolescents understand how both tasks may be accomplished.

In this and previous studies, social factors exerted a strong influence on the infant-feeding decision. In fact, adolescent bottle-feeders who had considered breast-feeding were distinguished from other bottle-feeders and from breast-feeders by the influence of their support network. Having friends who breast-fed and receiving encouragement to breast-feed by 2 more significant others appeared to motivate some adolescent bottle-feeders to consider breast-feeding their babies. Nevertheless, they appeared to have had fewer social resources to promote breast-feeding than breast-feeders had. Involving people important to the adolescent in interventions to promote breast-feeding should help to encourage her decision to breast-feed and adherence to that decision. In fact, many adolescent mothers have reported that it would be helpful to have members of their support network participate with them in the receipt of professional services. Prior studies have demonstrated the efficacy of using peer counselors in combination with lactation specialists to promote breast-feeding among low-income women.

Others note the important influence of health care providers, including nurses and physicians. In this study, breast-feeding adolescents were significantly more likely than either group of bottle-feeders to cite the importance of feeding advice from their health care providers. Our previous examination of racial/ethnic differences in the decision to breast-feed revealed that the feeding preference of physicians, nurses, and other health care providers was important to the breast-feeding choice among African Americans and whites, but not Mexican American adolescents. The majority of adolescent breast-feeders from all racial/ethnic groups reported encouragement to breast-feed by their health care providers whereas less than half of the bottle-feeders described this support. Thus, health care providers who are adequately trained to promote breast-feeding will continue to play a critical role in the choice of infant feeding.

Relative to breast-feeders, adolescents who had considered breast-feeding were also characterized by greater perceived stigmatization associated with being pregnant as a teenager, although this variable did not retain significance in the multivariate model. These findings are confirmed by recently published reports showing that after adjustment for confounding variables and contraindications, women with mistimed or unwanted preg-

### Table 5. Factors Associated With Decision to Breast-feed in Logistic Regression Model: Bottle-feeders Who Had Considered Breast-feeding vs Breast-feeders*

<table>
<thead>
<tr>
<th>Reproductive characteristics</th>
<th>Adjusted Odds Ratio† (95% Confidence Limits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did not breast-feed previous child</td>
<td>3.3 (1.4, 8.1)</td>
</tr>
<tr>
<td>Social influences</td>
<td></td>
</tr>
<tr>
<td>Did not follow feeding advice</td>
<td>4.6 (2.8, 7.6)</td>
</tr>
<tr>
<td>Delayed feeding decision</td>
<td>4.4 (2.6, 7.3)</td>
</tr>
<tr>
<td>&lt;2 Breast-feeding role models</td>
<td>1.8 (1.1, 2.9)</td>
</tr>
<tr>
<td>&lt;2 Others encouraged breast-feeding</td>
<td>2.8 (1.8, 4.6)</td>
</tr>
<tr>
<td>≥2 Others encouraged bottle-feeding</td>
<td>3.2 (1.7, 5.9)</td>
</tr>
</tbody>
</table>

*Bottle-feeders are those who bottle-fed, breast-feeders, who breast-fed. †Ethnicity was entered first in stepwise logistic regression analyses. Odds ratios are adjusted for ethnicity and all other variables listed.
nancies were significantly less likely to breast-feed than women whose pregnancies were planned. Efforts to persuade adolescents who are undecided about their feeding method must be sensitive to their ambivalence about being pregnant or conflicts about the unintended pregnancy with members of their support networks.

A finding consistent with previous research was that adolescents choosing to bottle-feed more often made that decision by themselves, whereas breast-feeders were more likely to rely on the infant-feeding advice of significant others. Adolescents may decline breast-feeding advice in an effort to assert their independence and achieve autonomy from adults, or simply because their infant-feeding choices are not presented in an informative fashion. Alternatively, they may not have a support network to provide advice. It is important that education programs on breast-feeding be presented in such a way that the adolescent does not prematurely close off her decisions because of lack of knowledge. The Best Start Marketing Program, which was recently developed to help educate economically disadvantaged pregnant women about breast-feeding, offers one example of such a program. Each woman is asked what she knows about breast-feeding, and in particular, what her concerns are. The question of whether she intends to breast-feed or bottle-feed is avoided, so that she does not become polarized in her thinking process. Each area of concern is then addressed over the weeks and months of prenatal care, to help her overcome these obstacles. This process allows the pregnant woman to become knowledgeable about the benefits of breast-feeding before an informed decision is made. This strategy may be especially effective with those pregnant adolescents who are undecided about their feeding method and yet prefer to make an autonomous feeding decision.

Adult breast-feeders have cited the WIC nutritionist as the most influential individual involved in making the decision to breast-feed. Previous studies have shown that WIC participation in conjunction with advice to breast-feed significantly increases the initiation of breast-feeding. In this and previous studies, more than half of the sample were enrolled in WIC, yet, in our study, fewer than half initiated breast-feeding. Although the amount or type of advice received from WIC employees was not assessed in our sample, this finding suggests that WIC nutritionists in our geographic region could have had a much larger role in helping adolescents overcome obstacles to breast-feeding. Findings such as these have led the US Department of Agriculture, which oversees the WIC program, to initiate a national campaign to support breast-feeding.

Several limitations of this study should be mentioned. First, the higher refusal rates observed among Spanish- vs English-speaking Mexican American adolescents and geographic restrictions for sample recruitment could limit the ability to generalize findings from this study. Second, all teens in this study were delivered of healthy babies, and all but a few had accessed available prenatal care. Factors associated with adolescent bottle-feeders who had considered breast-feeding could be quite different among adolescents who fail to receive prenatal care or whose babies require extended periods of hospitalization.

CONCLUSIONS

In an age of shrinking health care dollars, it is important to target limited intervention resources toward pregnant adolescents who seem to be the most amenable to change. We discovered that an important subgroup of adolescent mothers who had considered breast-feeding but ultimately chose to bottle-feed may be identified by a nurse, lactation specialist, social worker, or other health care provider in the later stages of pregnancy. Information to be collected includes financial status, family support, perceived barriers to breast-feeding and attending school or working, timing of the feeding decision, prior breast-feeding experience, breast-feeding role models, and encouragement to breast-feed by significant others. Interventions to promote breast-feeding within this special group could be implemented during the last few months of pregnancy and carried forward past the baby's delivery. Such efforts must work to remove barriers associated with working or attending school and breast-feeding. For example, it may be helpful to make breast pumps and private space for pumping readily available to these young mothers and provide role models of women who have successfully nursed and been away from their babies for extended periods of time. Members of the adolescent's support network could be invited to become involved in these interventions so that encouragement to breast-feed can come from multiple sources. Educators should also be aware that many pregnant adolescents may respond to feeling empowered to make their infant-feeding decision alone, rather than relying on exhortation from authority figures or advice from significant others. Therefore, strategies such as those used in the Best Start Marketing Program that explore breast-feeding beliefs and concerns while avoiding minilectures, could be most effective in encouraging young mothers to choose breast-feeding for their infants.


10. Peterson CE, DaVanzo J. Why are teenagers in the United States less likely to breast-feed than older women? Demography 1999;26:413-450.


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