Parental Barriers to Weaning Infants From the Bottle

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**Background:** Optimal bottle weaning should occur between 12 and 15 months of age. We hypothesized that high-risk populations have different parental attitudes, learned behaviors, and knowledge of weaning practices.

**Objective:** To determine whether high-risk populations are less likely to wean their children by 15 months of age than low-risk populations.

**Methods:** A cross-sectional survey using a convenience sample of parents was conducted at 3 community-based pediatric clinics. Spanish- and English-speaking parents with weaned and unweaned children 12 to 36 months of age were included in the study. A self-administered questionnaire was completed at a clinic visit. The questionnaire addressed aspects of parents' sociodemographic characteristics and included feeding history; weaning practices; sources of information about weaning; and parental behaviors, attitudes, and knowledge of age at which the child should be weaned.

**Results:** One hundred eighty questionnaires were completed. Marital status was related to weaning behavior. Seventy-six percent of single mothers had weaned their children in a timely manner, whereas 48% of married mothers had done so ($\chi^2 = 7.70; P = .008$). Parental education, race, and income were not significantly related to the timeliness of weaning. When respondents rated the helpfulness of multiple sources, only the health clinic was found to be significantly more important for the timely weaning group ($t = -2.13; P = .04$). Parents with timely weaned children stated that the mean ± SD optimal age for weaning is $13.6 ± 3.2$ months. Parents with unweaned and late-weaned children stated that the mean ± SD optimal age is $19.9 ± 6.6$ months. Bedtime bottle feedings were reported in more than 87% of the unweaned group. Sixty-nine percent reported poor dental development associated with delayed weaning.

**Conclusions:** Married parents are at risk of late weaning. Parents continue to allow their children to sleep with milk bottles in their mouths in bed at night. Parents are not aware of the medical problems associated with late weaning. Late-weaning parents are not knowledgeable about current weaning recommendations. Current approaches are not effective in altering set patterns of inappropriate weaning habits. Additional interventions and innovative parental education methods are needed to improve age-appropriate weaning practices.


**Editor’s Note:** The outcome of this study surprised me—I’d thought that married mothers would have weaned earlier—but I’m not sure why. Basic bias.

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Nursing bottle caries have been described since 1862, and they continue to have an increased prevalence among dental diseases in infants and children. The parents of affected children are less likely to have attended college, often are of lower socioeconomic background, are obese, are overindulgent, and are unaware of when weaning should occur. Nursing bottle caries occur in association with well-described risk factors and inappropriate feeding habits, including regularly putting a child to bed with a bottle containing juice or milk as a means of pacification, falling asleep with a pacifier covered with a sweetener in the mouth, and using syrups and other liquids for therapeutic reasons during long-term or recurring illnesses. Faulty feeding habits and parental risk factors may be altered by physician or parental attitudes, behaviors, and knowledge.

Despite strong recommendations from the American Academy of Pediatrics to wean infants and children from the bottle to prevent caries, the literature contains contradictory information about when to wean. The American Academy of Pediatrics’ Guidelines for Health Supervision II recommends the introduction of the cup at 6 months of age and complete weaning by 15 to 18 months of age. Koranyi et al reported that 94% of pediatricians provide information to parents about weaning and that 80% recommend specific ages to begin and accomplish bottle weaning, 12 and 16 months, respectively. Others have specified that ages to achieve weaning vary from 12 to 18 months. Counseling and edu-
PARTICIPANTS AND METHODS

A cross-sectional survey using a convenience sample of parents was conducted from December 1996 to March 1997 at 3 community-based pediatric clinics associated with the Department of Pediatrics, University of Texas–Houston Medical School. The study sites were located in medically underserved areas in and around Houston.

PARTICIPANTS

The populations served at these sites are primarily of lower socioeconomic background and are predominantly Hispanic and African American. Spanish- and English-speaking parents with children 12 months to 3 years of age were included in the study. After giving verbal consent at a clinic visit, parents of 200 children independently and anonymously completed questionnaires. Parents of children younger than 12 months and older than 3 years were excluded. A total of 143 questionnaires were completed and eligible for use.

INSTRUMENT

A 50-item questionnaire worded on a fifth- to sixth-grade reading level in English or Spanish was completed at a clinic visit. The first section of the questionnaire included questions about demographics: marital status, income, race or ethnicity, and sex and age of the parent and the child. In addition, information about the feeding history of the child was collected, and the person who primarily cared for the child was identified. In the next section, 24 Likert scale items were used to gather information about parental behavior, attitudes, and knowledge about weaning from milk and juice bottle feedings. Response categories ranged from 1 to 5, with 1 indicating strongly agree and 5 indicating strongly disagree.

An additional 9 Likert scale items were used to elicit the sources parents used for information about bottle weaning. Sources of information were scored from 1 to 4, with 1 indicating not helpful and 4 indicating very helpful. Open-ended questions were used to ask who told parents about weaning and to describe any problems or benefits that they knew were related to milk and juice bottle feeding beyond 12 months of age.

The last section included items directly related to active bottle weaning. Parents were asked to identify whether they were in the process of bottle weaning and at what age their child should be completely weaned from the milk and juice bottle (Table).

The questionnaire was piloted in 3 different pediatric community clinics, and the results of the pilot are included in the final results.

DATA ANALYSIS

All respondents who reported having weaned their child between 12 and 18 months of age were categorized in the timely weaning group, and all respondents who reported weaning at more than 18 months or later or who reported that their child was older than 18 months and unweaned were included in the late-weaning group. The relationship between weaning behavior and the risk factors was evaluated by the χ² test. An index was computed by adding up the 4 risk factors, where the presence of any 1 risk factor gave an index score of 1, the presence of 2 risk factors gave an index score of 2, the presence of 3 risk factors gave an index score of 3, and the presence of 4 risk factors gave an index score of 4. The helpfulness of several sources of information about weaning in the 2 groups was compared using independent group Student t tests. The difference between ideal weaning age and the child’s present age or the age of weaning was calculated. For all analyses, α = .05.
age was 19.9 ± 6.6 months (median, 24 months; range, 12-36 months). Parents believed that their children were currently an average of 3.8 months past the ideal weaning age.

Bedtime bottle feedings (ie, intermittent feedings throughout the night or sleeping with a bottle in the mouth) were reported in more than 87% of the unweaned group.

Parents were asked to identify problems and benefits associated with delayed weaning. Sixty-nine percent reported poor dental development and dental caries. Thirty-six percent indicated that there were no benefits or justifications for delaying weaning beyond 12 months of age.

It is apparent from multiple studies that the optimal age for weaning is between 12 and 15 months. Studies name education as the main route to timely weaning and prevention of the morbidity associated with nursing caries.

The objective of this study was to learn more about the practice of prolonged bottle feeding or late weaning among populations with risk factors in medically underserved areas. Specifically, we addressed how marital status, race, socioeconomic status, and education are related to bottle weaning and which behaviors, beliefs, attitudes, and knowledge have affected weaning practices in these populations.

Our study results show that single mothers with infants 12 to 18 months of age had more timely bottle weaning habits compared with married mothers. This is in contrast to results of previous studies that suggested that single-parent households have an increased risk of late weaning practices. The data suggest that these single mothers may seek and receive advice more often from relatives and friends and medical personnel. Parental education and race were not related to timeliness of weaning, as shown in other studies. The data from this study revealed a trend that parents with an annual income below $15 000 per year weaned at 18 months of age or older in contrast to parents in higher income brackets.

In our study, married mothers in households with incomes less than $15 000 per year were at risk of delayed weaning. Possible explanations may include an increased number of siblings in the married households who are bottle-fed and spousal pressure to use the milk bottle as a pacifier, especially at night. Risk factors that this study did not explore include obstetric and parental indulgence. Parental indulgence may explain the finding that 90% of the parents in the late-weaning group with children 18 to 36 months of age allowed their children to sleep with a bottle in their mouth in bed at night and during day nap times. Presumably, parents use bottle feedings to induce sleep at nap times and bedtimes.

Parents in the timely weaning group seemed to seek information more often from relatives, friends, and neighbors as well as from ancillary medical personnel. Par-
ents in the late-weaning and unweaned groups used physicians as the most helpful sources for weaning information. This is interesting and contradictory and may represent a response bias within the questionnaire or an indication of inadequate transfer of bottle weaning information from medical personnel to parents.

Results of the study by Koranyi et al.10 stated that most physicians recommended a specific age for both onset and accomplishment of bottle weaning. Pediatricians (72.2%) provided multiple reasons for stopping bottle feedings, and 73% recommended a specific method for bottle weaning. There seems to be a missing link between parents and the medical establishment in improving parental behaviors to extinguish prolonged bottle feeding beyond 12 months of age. Weaning in this population can be a challenge. These parents are often emotionally ill equipped to cope with the demands and distresses of a toddler crying for a bottle containing milk or juice. This act may distract parents and promote delayed or prolonged weaning.

Results of this study show that parents in the late-weaning group who had unweaned children 18 to 36 months of age were unaware that delayed weaning was related to anemia, poor weight gain, and obesity. Fifteen percent were uncertain or disagreed that bottle feeding may cause tooth decay. These results reinforce the importance of education in explaining the risks associated with delayed weaning to change parental beliefs and to modify behaviors and attitudes of parents with children beyond 12 months of age who are bottle-fed.

Parents in this study were asked to select a specific age at which their child should be completely weaned from the bottle, whether they had timely weaned or delayed weaning their children. The data indicated that parents with timely weaned children established an acceptable age, with a mean ± SD of 13.6 ± 3.2 months. This age lies well within the recommended age for completion of weaning. Parents of late-weaning children reflected a mean ± SD of 19.9 ± 6.6 months, indicating that parents of late-weaning children are not knowledgeable about current weaning recommendations. It is clear that previous and current approaches in these high-risk populations are not effective in altering set patterns of inappropriate habits or in improving preventive behaviors. Additional methods to modify behavior may be necessary.

As members of the health profession and frequently the first medical contact for a mother of a newborn, pediatricians are in a favorable position to teach and direct parents on the methods of weaning. Early nutritional counseling, introduction of bottle weaning information, and discussion of cup use at the 4- and 6-month well-child visits may facilitate parental interest and motivation for weaning.

Ancillary medical personnel such as clinic nurses, nutritionists, or other medical extenders who have contact with the mother during a clinic visit can also reinforce positive and appropriate feeding practices. Stressing continuity of care in this population is key to allowing consistent flow of information. Our data suggest that there is a vast opportunity through the previously mentioned methods to improve timely weaning practices and to prevent or decrease the public health problem of nursing caries, the financial burden to parents for dental restorative procedures, and the seen or unforeseen pain and misery to the child associated with poor dental hygiene. This information may provide further study to review the pediatric anticipatory guidelines in residency programs. Also, it may provide an impetus to establish written standardized recommendations on bottle weaning methods that can provide parents with guidelines for successful, timely bottle weaning practices.

Accepted for publication May 4, 1998.

Presented in part at the Southern Society for Pediatric Research, New Orleans, La, February 7, 1998.

Advice regarding questionnaire content and editing assistance were provided by the Office of Medical Education Research and Development, College of Human Medicine, Michigan State University, East Lansing, and by Virginia Moyer, MD, MPH, from the University of Texas–Houston Medical School.

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