



Original Article

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# Bottle-using behaviors in a group of Bangkok preschool children

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## Abstract

**Objective** To study the bottle-using behaviors in a group of preschool children in Bangkok, Thailand.

**Materials and methods** The sample consisted of 970 preschool children aged 1-6 years old from one kindergarten in Bangkok. Parents/caregivers completed self-administered questionnaires including information related to demographic data, the children's bottle using or weaning status and the parents' attitudes towards bottle using.

**Results** Out of 824 questionnaires returned (85%), 605 were valid (73.4%). Results showed that 58.2% (352/605) of children (age  $2.6 \pm 0.9$  years) still used a feeding-bottle while 41.8% (253/605) already weaned from bottle (age  $4.2 \pm 1.2$  years). The mean age at the weaning time was  $2.8 \pm 0.9$  years. Different opinions were found in some attitudes between parents/caregivers of bottle-using and weaning group. The most prevalent reason that led parents/caregivers of bottle-using group to allow the continuation of the habit was the child refused weaning. Of this group, 32.1% lacked knowledge concerning the time their children should wean. As for the weaned group, the most reason for weaning was the children quit the habit by themselves and the most difficult time to wean was before bedtime. It was also found that the persons who provided weaning information were relatives and friends (45.6%).

**Conclusion** Prolonged use of bottles beyond recommended age was found in the majority of preschool children in this study. Despite of health care workers, laypersons may help provide dental education including feeding practice information to parents and caregivers.

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**Key words:** behavior; feeding bottle; preschool children

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## Introduction

Dental caries in primary teeth is a major health problem in Thailand. According to the last National Oral Health Survey in 2000–2001 showed that 65.7 and 87.4% of 3- and 6-year-old Thai children experienced dental caries in their primary teeth with dmft of 3.61 and 5.97 respectively.<sup>1</sup> Most of the decayed primary teeth were not treated.

Early childhood caries (ECC) is a term used to describe dental caries occurring in the primary dentition of young children. ECC is commonly associated with incorrect feeding habits such as putting a child to bed with a bottle, bottle feeding with sweetened beverages and prolonged breastfeeding.<sup>2,3</sup>

Parents or caregivers, i.e. grandparents, relatives or neighbors have direct role and responsibility for feeding and oral hygiene behaviors of young children at home. Therefore, a better understanding of the knowledge, beliefs and practices of these caregivers should contribute to formulation of more effective prevention strategies to benefit infants and children. The purpose of this article is to study the bottle feeding behaviors of a group of preschool children in Bangkok, Thailand.

## Materials and methods

The sample consisted of 970 parents or caregivers of preschool children who attended a Nursery and Kindergarten 1–3 of Den-Lar School in Bangkok. The children were around age 1–6 years old with mean age of  $3.6 \pm 1.2$  years.

The parents or caregivers were requested to complete a questionnaire which included information regarding demographic data, children's bottle using status, the parents/caregivers' attitudes toward bottle using behaviors, the feeding practices for children who were still on bottles and the weaning behaviors for those who already quit the bottles. The survey instrument was pre-tested with 60 parents who brought their

children to attend Pediatric Dentistry clinic, Faculty of Dentistry, Chulalongkorn University. During the pretest, some questions that were found to be confusing were revised.

Descriptive and analytical statistics were conducted using SPSS for Windows version 10.00. The chi-square test for categorical variables was used for comparison of proportion. P-value of  $<0.05$  was considered statistical significant.

## Results

A total of 824 questionnaires were returned, thus a response rate of 85%. However, only 605 questionnaires were complete (73.4%). The mean age of the respondents was  $32.9 \pm 6.8$  years old, most were mothers (60.3%). Over 60% of the respondents finished a bachelor degree or higher. The mode salary was 10,000–30,000 baht/month. The majority was married (Table 1).

Respondents reported that 58.2% of the children were still on bottles with the mean age of  $2.6 \pm 0.9$  years. The children who already weaned from the bottles were older with the mean age of  $4.2 \pm 1.2$  years (Table 2).

With respect to attitudes toward bottle using habits, 64.4% of the parents/caregivers of weaned group and 57.1% of the parents/caregivers of bottle-using group realized that inappropriate bottle feeding may be a risk factor for dental caries. However, the parents indicated that nursing bottle before nap time helped their child to sleep and was the easiest way to stop a child from crying (Table 3). The different opinions were found between bottle-users and non-bottle users on the following attitudes: bottle feeding is the best way a child can drink milk; if the child does not like to eat, bottle feeding can be continued; a child should wean from a bottle after 1 year of age; early weaning results in malnutrition; and early weaning results in poor mental health ( $p < 0.05$ ).

**Table 1** Demographic data of preschool children's caregivers

Characteristics	N	%
Gender		
Male	125	20.7
Female	478	79.3
Age		
Mean age $32.9 \pm 6.8$ years		
Relationship		
Mother	360	60.3
Father	88	14.7
Grandparent	19	3.2
Caretaker	42	7.0
Other	88	14.7
Education		
Elementary school	18	3.0
High school	195	32.7
Bachelor degree or higher	383	64.3
Family Salary (Baht/month)		
< 10,000	126	20.9
10,000-30,000	253	42.0
30,000-50,000	125	20.7
> 50,000	99	16.4
Marital status		
Married	507	87.0
Divorced	51	8.7
Single	25	4.3

**Table 2** Weaning status

Bottle using group	Age (years)	N	%
Still on bottle	$2.6 \pm 0.9$	352	58.2
Weaned	$4.2 \pm 1.2$	253	41.8

**Table 3** Attitudes of preschool children's caregivers on bottle using according to weaning status

Attitude	Bottle users (n=352)		Non-bottle users (n=253)		p-value
	N	%	N	%	
	Primary teeth are important, therefore should be prevented from getting decayed.	302	85.8	222	
Bottle feeding is the best way a child can drink milk.	228	64.8	131	51.8	0.002*
Bottle feeding before bedtime results in good sleep.	238	67.6	152	60.1	0.068
Bottle feeding should follow by water.	312	88.6	227	89.7	0.814
If the child does not like to eat, bottle feeding can be continued.	100	28.4	51	20.2	0.034*
Improper bottle feeding results in dental caries.	201	57.1	163	64.4	0.083
A child should wean from a bottle after 1 year of age.	92	26.1	116	45.8	0.000*
Early weaning results in malnutrition.	140	39.8	63	24.9	0.000*
Early weaning results in poor mental health.	220	62.5	132	52.2	0.012*
Nursing bottle works best to stop a child from crying.	179	50.9	133	52.6	0.727

\*  $p < 0.05$

Table 4 presents the feeding behaviors of the bottle-using group. The parents/caregivers were asked about their feeding practices. It was found that the bottles were given up to 5 times a day, mostly before bedtime. The same amount of children (44%) used nursing bottles to put them to sleep and drank water after nursing bottles. Only 6% brushed or rinsed after nursing bottles. The content of the bottle was another consideration of the study. Various contents were put in the nursing bottles, the highest one reported was milk. In addition, the most prevalent reason that led parents to allow the continuation of the habit was the child refused weaning. It is interesting to note that about 32.1% of the parents lacked knowledge concerning the time their children should wean.

Table 5 shows the information of children who already weaned from nursing bottles. The mean age of children at the time of weaning was  $2.8 \pm 0.9$  years. The most answered reason for weaning was the children quit the habit by themselves. For the question about how the parent/caretaker chose for weaning, most parents reported on gradual weaning which took months to accomplish. The parents/caregivers did not find any dramatic change in the child's behavior during weaning. However, they reported the most difficult problems encountered were crying and sleep problem. The most difficult time to wean was before bedtime. It is surprising that the persons who provided weaning information were relatives and friends (45.6%).

**Table 4** Feeding behaviors of the bottle-using group

<b>Behavior</b>	<b>N</b>	<b>%</b>
Number of nursing bottle users		
< 3 times	147	41.9
3-5 times	159	45.3
> 5 times	45	12.8
Time of feeding		
Morning	128	36.6
Daytime	147	42.0
Before bedtime	267	76.3
Night	87	24.9
Anytime	94	26.8
Pattern of nursing bottle use		
Use bottle until sleep	154	44.0
Drink water after nursing bottle	154	44.0
Brush or rinse after nursing bottle	21	6.0
Other	18	5.1
Contents of the bottle		
Milk	311	89.4
Ovaltine/chocolate drinks	109	31.3
Sweetened juice	50	14.4
Carbonated drinks	21	6.0
Other	35	10.1
Reasons why parents allowed the habit		
Child refuses weaning	172	49.3
Relatives against weaning	39	11.2
Child does not eat	74	21.2
Parents lack knowledge	112	32.1

**Table 5** Information of the weaned group

<b>Behavior</b>	<b>N</b>	<b>%</b>
Age weaned		
mean age $2.8 \pm 0.9$ years		
Reason for weaning		
Self weaning	136	54.6
Advice from doctors or dentists	73	29.3
Other	38	15.3
How to wean		
Sudden weaning	21	8.4
Gradual weaning	219	88.0
Other	8	3.2
Method of weaning		
Dilute milk content	28	11.2
Decrease amount of milk	93	37.1
Discard bottle	160	63.7
Other	33	13.1
Duration of weaning		
Days	22	9.2
Weeks	87	36.6
Months	129	54.2
Behavior change during weaning		
No change	85	34.4
Crying	73	29.6
Cannot sleep	57	23.1
Mood swing	28	11.3
Less eating	38	15.4
Other	20	8.1
The most difficult time to wean		
Morning	6	2.4
Daytime	27	10.8
Bedtime	196	78.4
Night	13	5.2
Persons provided weaning information		
Doctors/Pediatricians	46	18.4
Dentists	43	17.2
Relatives/Friends	114	45.6

## Discussion

The American Academy of Pediatric Dentistry (AAPD) recommends that infants should be weaned from the bottle at 12 to 14 months of age starting by parents having their infants drink from a cup as they approach their first birthday.<sup>4</sup> In Thailand, the Thai Society of Pediatric Dentistry recommends a later weaning age of 18 months to coincide with the age when the child visits a well baby clinic for immunization.<sup>5</sup>

The results of the present study indicated that the majority of our samples (58.2%) which were a group of preschool children in Bangkok were still using a bottle beyond the AAPD recommended age, even in the already weaned group that reported average weaning age  $2.8 \pm 0.9$  years. Only 11.1% (N=28) in the weaned group (N=253) reported weaning age in accordance with AAPD recommendation. This result is consistent with previous studies. Oulis *et al.*<sup>6</sup> found that Greek children discontinued the nursing habit at the age of 33 and 37 months for the non-nursing caries and nursing caries group, respectively. In a study surveying children attending Mahidol University dental clinic, Phonghanyudh and colleagues reported that majority of subjects (87%) were bottle-fed over the period of 24 months.<sup>7</sup> ECC has been related to prolonged feeding beyond 1 year of age.<sup>8,9</sup> The frequency of bottle use in this study was as high as 5 times per day or more. Furthermore, 76.3% reported taking a bottle before bedtime which potentially is more damaging to a child's teeth (Table 4).

Concerns must be expressed about the extensive range of different drinks which had been added to the bottle. Triroj *et al.*<sup>10</sup> in their 2003 survey of preschool children in 5 provinces in Thailand found that sweet flavored milk was provided to 66.5% of the 4-year-old samples. It was reported that children whose bottle contained sweetened solution had higher ECC prevalence.<sup>11</sup> However, although milk was the predominant finding found in this study, no enquiry was made as to whether

the milk was sweetened, one of the limitation of the study.

From both a nutritional and dental perspective, a good start in weaning and drinking practices is fundamentally important. If weaning on to a varied diet and using a cup are introduced at the appropriate time, natural development skills, such as chewing and sipping are encouraged. Unfortunately, well established habits are hard to break and it can be difficult to remove a bottle from an older child.<sup>12</sup>

Based on the results of this study, over half the parents/caregivers realized that inappropriate use of bottle was a problem for dental health. In spite of this knowledge, they still allowed the habit. Frazier *et al.*<sup>13</sup> studied parents in timely and late weaning group and found that they believed their children should be completely wean from bottle beyond the ideal weaning age. More than 74% of the sample in the bottle-user group disagreed on the age of 1 year when the use of a bottle should be discontinued. In a study evaluating risk factors for dental caries in young children attending Mahidol University dental clinic,<sup>12</sup> it was found that children who have the bottle held in the mouth while sleeping presents a significant risk factor as well as Triratvorakul and Choksombatchai's study.<sup>14</sup>

The different opinions in both groups showed that parents and caregivers in bottle-user group worried about insufficient nutrition and mental health if their children did not discard bottles themselves. The better understanding of parental attitudes will help professionals to suggest and explain what will be the obstacles in their mind.

In this paper, an attempt was made to evaluate the source of information parents/caregivers acquired concerning the bottle weaning. It is surprising that most of them (45.6%) informed that the persons they went for weaning information were friends and relatives. This finding is in agreement with the result of Frazier *et al.*<sup>13</sup> It may point us their thought they need not to consult

health professionals in this circumstance. Therefore, dentists and the dental profession should provide more information to the public concerning oral health prevention, oral hygiene practices and a time to reinforce healthy practices.

In this study we try to gather successful weaning measures from parents and caregivers, 88% of weaned group used gradual weaning technique and accepted that it took several months to accomplish (Table 5). However, the method they mostly used such as discarding bottles seems to contradict with the technique they informed. Domoto and colleagues<sup>15</sup> interviewed the parents of Mexican-American children concerning their ratings of likeliness for a range of weaning recommendations. Most parents preferred slow reduction of the amount in the bottle at extra nights feeding (92%) and substitution the cup slowly (86%) to diluting milk slowly (81%). Immediate substitution of cup for bottle and the elimination of extra nighttime feedings were the least likely ratings most unlikely recommendation. In a survey of pediatricians concerning the reasons and the methods they recommended to parents, Koranyi *et al.*<sup>16</sup> found that pediatricians provided parents with multiple reasons including dental caries and the method they recommended were gradually reducing the number of bottles (52%), abrupt cessation (17%) and diluting feeding substance or providing access to water only (4%).

To our knowledge, there is no specific conclusion on the bottle weaning technique recommendations, several measures can be used depending on parental attitude, children's behavior and culture. Despite of weaning recommendations, the value of brushing with fluoride toothpaste should also be emphasized to parents. It is necessary to promote dental awareness amongst the major caregivers to facilitate early dental checkups for young children. However, results of this study cannot be generalized to general population since the samples recruited from one kindergarten in Bangkok were not randomly selected.

## Conclusion

Prolonged use of bottles beyond AAPD recommended age was found in the majority of preschool children in this study. The present study indicated a need for action in discouraging the use of a baby bottle after the age of 1 year and to improve the public knowledge and awareness of health problems relate to prolonged use of a feeding bottle.

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# พฤติกรรมการใช้ขวดนมของเด็กก่อนวัยเรียน กลุ่มหนึ่งในกรุงเทพมหานคร

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## บทคัดย่อ

**วัตถุประสงค์** เพื่อศึกษาการใช้ขวดนมของเด็กก่อนวัยเรียนกลุ่มหนึ่งในกรุงเทพมหานคร

**วัสดุและวิธีการ** กลุ่มตัวอย่างเป็นเด็กก่อนวัยเรียนในโรงเรียนอนุบาลแห่งหนึ่งในกรุงเทพมหานครอายุ 1-6 ปี จำนวน 970 คน ที่ผู้ปกครองตอบแบบสอบถามเกี่ยวกับพฤติกรรมการใช้ขวดนมของเด็ก และทัศนคติต่อการเลี้ยงดูเด็กด้วยขวดนม

**ผลการศึกษา** จากการวิเคราะห์ข้อมูลแบบสอบถามจำนวน 605 ฉบับ (ร้อยละ 73.4) จากที่ตอบกลับมา 824 ฉบับ (ร้อยละ 85) พบว่ากลุ่มเด็กที่ยังคงใช้ขวดนมมีร้อยละ 58.2 อายุ  $2.6 \pm 0.9$  ปี ขณะที่กลุ่มที่เลิกใช้ขวดนมแล้วมีร้อยละ 41.8 อายุ  $4.2 \pm 1.2$  ปี โดยมีอายุเฉลี่ยขณะเลิกขวดนม  $2.8 \pm 0.9$  ปี มีความเห็นที่แตกต่างกันในบางทัศนคติระหว่างผู้ปกครองของเด็กสองกลุ่ม ผู้ปกครองกลุ่มที่ยังใช้ขวดนมให้เหตุผลเด็กไม่ยอมเลิกเองมากที่สุด และมีร้อยละ 32.1 ไม่ทราบเวลาเหมาะสมที่ควรเลิกใช้ขวดนม ผู้ปกครองกลุ่มที่เลิกใช้ขวดนมแล้วให้เหตุผลเด็กเลิกเองมากที่สุด และมีร้อยละ 45.6 ได้ข้อมูลเกี่ยวกับการเลิกขวดนมจากญาติและเพื่อน

**สรุป** กลุ่มที่ศึกษาส่วนใหญ่ยังคงเลี้ยงดูเด็กด้วยขวดนมในเด็กที่โตเกินกว่าอายุที่ทันตแพทย์แนะนำ การให้ความรู้ที่ถูกต้องแก่ประชาชนทั่วไปเกี่ยวกับการเลี้ยงดูเด็กด้วยขวดนมจะมีส่วนช่วยในการให้ข้อมูลแก่ผู้ปกครองอีกทางหนึ่ง

(จ. ทันต. จุฬาฯ 2551;31:273-82)

**คำสำคัญ:** ขวดนม; เด็กก่อนวัยเรียน; พฤติกรรม