

ORIGIANL ARTICLE**INFANT BOTTLE-FEEDING PRACTICE, AGARO TOWN, SOUTHWEST ETHIOPIA****Fikadu Andea¹, BSc, Hailu Nida², MD, Challi Jira^{3*}, BSc, MPH****ABSTRACT**

BACKGROUND: *The prevalence and duration of breast-feeding is declining and being replaced by formula milk. The morbidity and mortality of bottle fed infants is much greater than breast fed infants. The aim of this study was to determine the prevalence of bottle-feeding and to assess factors that contribute to the practice of bottle-feeding.*

METHODS: *A community based cross-sectional survey on factors contributing to bottle-feeding practice in Agaro town was conducted between February 5 and 9, 2001. A total of 224 mothers who had children between the ages of 0 and 24 months were included in the study. Statistical test of significance between bottle-feeding practice and different variables have been made.*

RESULTS: *Most children were started on complementary diet before the age of 4 months. Only few mothers who had a chance to give birth in health institutions were advised on advantages of breast-feeding. The overall prevalence of bottle-feeding was 79 (35.0%). The practice of bottle-feeding was found to be higher among mothers with educational background above senior high school 8(66.7%), Government employees 11(63.1%) and those with relatively higher monthly family income 16(76.2%). The main reasons bottle-feeding practice was insufficient breast milk 56(70.9%) and mothers' workload. Among mothers who had a chance to give birth in a health institution, few of them (23.7%) had got an advice about the initiation of breast-feeding and the potential hazards of bottle-feeding.*

CONCLUSION: *The study indicated that the practice of bottle-feeding was high among mothers who are relatively high in their educational level and among those who were government employees. Health education on importance of exclusive breast-feeding for the first 4 months needs to be emphasized.*

KEY WORDS: Breast-feeding, bottle-feeding, mother

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INTRODUCTON

It is only during few decades that pediatricians, nutritionists and food technologists have started to work on alternative source of nutrition for infants. The first attempt to provide preparatory milk formula as an artificial substitute for human breast milk is ascribed to Gerlslen Boger and Ruth in 1919. Since then food technology has made it possible to provide proprietary milk formula (1).

Today bottle-feeding has become a practice in developed countries and urban communities of developing countries. There is a current shift from traditional feeding practice towards shorter breast-feeding and introduction of bottle-feeding (2,3). The increasing incidence of bottle-feeding in Africa reflects the absorption of western way of life. Bottle-feeding is dangerous practice in developing countries because of low level of income, poor environmental and personal sanitation and limited parental education (4).

Several factors contribute to the starting of bottle-feeding such as rapid urbanization and changing social value, but by far the most common cause are the extensive advertising and aggressive sale practice of manufactured infant formulas (5). Workload of mothers, short duration of maternity leave, educational status of mother and family income are also important factors contributing to bottle-feeding.

The widely used infant formulas are manufactured in developed countries and importing them can represent a considerable drain on the financial resources of the developing countries. Clearly any large-scale replacement of breast-feeding thereby by bottle-feeding would put a very considerable financial strain for the countries foreign reserves (6).

In recent year a surge of research has shown that, as well as being nutritious and hygienic, breast milk "communizes" the child and helps to fight against infection. Milk powder in contrast, can be diluted and served with un sterile bottle, which is left in the tropical heat. The result is the babies who are bottle-fed are more likely to both and to malnutrition and to contract infection (2,7).

The knowledge and attitude of health workers has significant effect on infant feeding practice. Studies done in Kenya have shown that health workers were unable to promote breast-feeding among their clients due to lack of knowledge and practice (8,9).

In Ethiopia the proportion of mothers who still breast-feed their child are considerably low among urban women particularly among women of the capital city, Addis Ababa, followed by women with junior secondary school and above educational level regardless of their setting (10). Similarly infant feeding problem has been also observed in urban and rural setting of Jimma zone, where many mothers introduced cow's milk before the age of 4 months with the assumption that it would increase their babies' weight. A study in a rural setting around Jimma area showed that 21% of nursing mothers bottle-fed their babies (11,12). In this study an attempt was made to determine the prevalence of bottle-feeding and contributing factors to the practice of bottle-feeding in Agaro town.

MATERIALS AND METHODS

A community based cross-sectional survey was conducted to assess factors contributing to bottle-feeding practice among mothers who have children 0-24 months of age in Agaro town, Jimma zone, south west of Ethiopia in February 2001.

Agaro town has a population of 27,757 of which 13,954 are males and 13803 females (projected from population and housing census of Ethiopia, 1994 (11). The town is divided administratively into five "Kebeles". All houses have been numbered by *Kebeles* for administrative activities. The total sample size 224 was determined from source population (children 0-24 months of age), which was 6.54% using prevalence of bottle-feeding of 21% (12) in order to select the study subjects stratified random sampling scheme was used. The strata were municipal administration composed of "kebeles".

With probability proportion to size (PPS), sample was drawn from each of the *kebele*. Simple random sampling technique was employed to attain the required sample size. To collect data, pre-tested and standardized questionnaire was used which addresses the socio-demographic, cultural and economic characteristics of the study group. The questionnaire was prepared in English and then translated into Amharic. It was administered to the mothers by trained interviewers. Data was analyzed using a hand calculator. Each respondent's response was examined to each question using different variables to classify the response, then the results presented in tables.

An appropriate statistical test was employed using chi-square (χ^2) and $p < 0.05$ was used to see significant association between bottle-feeding practice and different factors.

RESULTS

A total of 224 mothers who have children 0-24 months of age were included in the study. Out of which 164 (73.2%) were housewives, 197(88.0%) were married, 141(63.0%) were Muslims in religion and 126 (56.2%) were Oromo by ethnicity. From the studied mothers 130 (58.0%) had

monthly income greater than Ethiopian Birr 200 and 49 (21.9%) were illiterate (Table 1).

The overall prevalence of bottle-feeding in this study was 79 (35.0%). Among 79 mothers who practiced bottle-feeding their index children 62 (78.4%) had first introduced cows' milk, 12 (15.1%) formula milk, 1(1.3%) fruit juice and 4 (5.0%) other foods like cereals, legumes, and tea. Fifty-eight (73.4%) of bottle-feeding mothers introduced the first additional food before the index child was 4-6 months, the remaining 21 mothers introduced the first additional food to their children after they reached 6 months of age using bottle.

The main reasons identified for starting bottle-feeding in this study were; insufficient breast milk 56(70.9%), mothers back to work 8 (10.1%), availability of formula milk 5 (6.3%), short maternity leave 3 (3.8%), fear of change in breast shape and others like the child refusing breast milk or the health status of the child (Table 2).

Among 224 mothers 159 (71.0%) had regular antenatal care during the present pregnancy and 135(60.3%) gave birth in a health institution. But only 32 (23.7%) admitted that they got advice regarding advantages of breast-feeding and potential hazards of bottle-feeding.

Out of 14 single mothers 10 (71.4%) of them were bottle-feeding their children in contrast to those married of whom 60 (30.4%) of them were bottle-feeding. There was significant association between marital status of mother and bottle-feeding ($X^2=16.6$, $p < 0.005$). The practice of bottle-feeding is higher among mothers who have relatively high monthly income. Sixteen (76.2%) of mothers whose monthly income was greater than Birr 500 bottle-fed their index children, while only 27.2% of mothers with monthly family income less than Birr 100 practiced bottle-feeding.

There was significant association between family monthly income and bottle-feeding practice ($p < 0.005$). Out of 49 illiterate mothers who were included in this study only 3 (6.1%) of them practiced bottle-feeding their children. Thirty (60.0%) of mothers whose educational level was 9-12 grade practiced bottle-feeding. Thus the practice of bottle-feeding is higher among mothers with educational background of 9th grade and above. There was also a significant association between educational level and bottle-feeding practice in this survey ($\chi^2 = 39.06$, $p < 0.005$). Out of 164 housewife mothers, 43 (26.2%) of them practiced bottle-feeding, while 11 (63.0%) of salary paid employees and 18 (58.0%) of

merchant mothers were bottle-feeding their index children. Thus the practice of bottle-feeding was significantly higher among salary paid employees and merchants ($\chi^2 = 22.03$, $p < 0.005$). There was no association between ethnicity of mothers and bottle-feeding practice (Table 3).

Out of the 79 mothers who were bottle-feeding their index children, 48 (60.8%) used boiling and 23 (29.1%) used only water to rinse the bottles. Eight (10.1%) other methods like rinsing with soap and water. Only 32 (40.5%) of mothers cleaned the bottles every 6 hours, while 4 (5.1%) cleaned the bottles only when they think the bottles were spoiled.

Table 1. Socio-demographic Characteristics of mothers of the index children Agaro town South-west Ethiopia, February 2001

Characteristics	Group	Number	Percent
Age of mothers	15 – 24	91	40.6
	25 – 34	103	46.0
	35 – 44	27	12.1
	≥ 45	3	1.3.0
Marital Status	Single	14	6.2
	Married	197	88.0
	Divorced	7	3.1
	Widowed	6	2.7
Educational level	Illiterate	49	21.9
	Read & write	16	7.1
	1-6 grade	67	29.9
	7-8 grade	30	13.3
	9-12 grade	50	22.4
	Above 12 th grade	12	5.4
Occupation of mothers	House wife	164	73.2
	Salary Employee	19	8.5
	Merchant	31	13.8
	Others	10	4.4
Religion	Muslim	141	63.0
	Christian	83	37.0
Ethnicity of mothers	Oromo	126	56.2
	Amhara	42	18.8
	Gurage	35	15.6
	Others*	21	9.4
Family monthly income (in Birr)	< 100	22	9.8
	101-200	72	32.1
	201-300	63	28.1
	301-500	46	20.5
	> 500	21	9.4

* (Kaficho, Tigre, Yem, Dawro...)

Table 2. Reason given by mothers for the practice of bottle-feeding Agaro town, South-West Ethiopia, February 2001

Reasons for bottle-feeding practice	No	%
Insufficient Breast Milk	56	70.9
Back to work	8	10.1
Short duration of Maternity leave	3	3.8
Availability of infant formula	5	6.3
Adopted child	2	2.5
Breast feeding change shape of breast	2	2.5
Others	3	3.8
Total	79	100.0

Table 3. Bottle-feeding and socio-demographic characteristics of mothers, Agaro town, south west Ethiopia February, 2001

Marital status	Bottle-feeding		No Bottle-feeding		Total		χ^2 test P-value
	No	%	No	%	No	%	
Single	10	71.4	4	28.6	14	6.2	$\chi^2=16.61$ P<0.005 df=3
Married	60	30.4	137	69.6	197	88.0	
Divorced / Widowed	9	69.2	4	30.8	13	5.8	
Monthly Family Income (Birr)							
<100	6	27.2	16	72.8	22	9.8	$\chi^2=36.06$ P<0.005 df=4
101-200	11	15.2	61	94.8	72	32.1	
201-300	21	33.3	42	66.7	63	28.1	
301-500	25	54.3	21	45.7	46	20.5	
>500	16	76.2	5	23.8	21	9.4	
Occupational Status							
House-wife	43	26.2	121	73.8	164	73.2	$\chi^2=20.95$ P<0.00 df=3
Salary paid employee	11	63.1	7	36.9	19	8.5	
Merchant	18	58.0	13	42.0	31	13.8	
Others	6	60.0	4	40.0	10	4.5	
Ethnicity of mothers							
Oromo	43	34.1	83	65.9	126	56.2	$\chi^2=6.41$ P>0.05 df=7
Amhara	17	40.5	25	59.5	42	18.8	
Gurage	15	42.9	20	57.1	35	15.6	
Others*	4	19.1	17	81.0	21	9.4	
Educational level							
Illiterate	3	6.1	46	93.9	49	21.8%	$\chi^2=39.02$ P<0.005 df=5
Read and write only	4	25.0	12	75.0	16	7.2	
1-6 grade	22	32.8	45	67.2	67	29.9	
7-8 "	12	40.0	18	60.0	30	13.4	
9-12 "	30	60.0	20	40.0	50	22.3	
Above grade 12	8	66.7	4	33.3	12	5.4	
Total	79	35.0	145	65	224	100	

* (Kaficho, Tigre, Yem, Dauro...)

DISCUSSION

The overall prevalence of bottle-feeding in this study was found to be 79 (35.0%), which was similar with study done in urban district of Shangji, China where 33.0% of women were bottle-feeding their babies (7) and higher than the reports from Papua New Guinea and Mauritius Island, where the prevalence was 21.0%, and 20.0% respectively (13).

The majority, 62 (78.4%) of mothers who practiced bottle-feeding had first introduced cow's milk to their index children with bottle, of these bottle feeding mothers, 58 (73.4%) were started bottle-feeding their children at less than 4-6 months of age, this is similar to study done on breast-feeding practice in Akaki Beseka, Ethiopia (14) in 1986 in which 208 (72.3%) of factory working mothers started supplementary diet (cow's milk and formula milk) at less than 3 months of age using bottle.

The reason for starting bottle-feeding indicated by majority of bottle-feeding mothers 56 (70.9%) was insufficient breast milk. This is in agreement with the study done in Teheran, Iran (14) in 1990 in which 370(74.0%) of studied mothers who supplement their breast milk with formula milk reported breast milk insufficiency as their reason. Thus insufficiency of breast milk, workload of mothers and availability of formula milk were the main factors that contribute to bottle-feeding among the identified factors in this survey.

Among bottle-feeding mothers, 53 (67.0%) mothers had the chance to attend antenatal clinic during their gestation period of the index child and 45 (57.0%) of them gave birth in a health institution. From those mothers who delivered their index child in health institution only 32 (23.7%) of them have got an advice regarding breast-feeding and the hazards of bottle-feeding during their delivery. This is

in agreement with the study done on health workers knowledge, attitude and practice in Kenya in 1982, in which health workers were generally unable to promote breast-feeding among their clients (8,9). This could be due to apathy and lack of knowledge among health workers. The practice of bottle-feeding was found to be higher among single 10 (71.4%), divorced 5 (71.4%) and widowed 4(66.7%) in contrast to those married 60 (30.4%).

In this survey marital status of mothers have significant association with bottle-feeding practice this could be due to the reason that they usually not spent their time with the child at home and the possibility that they leave their child with grand mothers and others relative to use bottle-feeding.

The survey indicated that the practice of bottle-feeding was higher among mothers with better educational background and higher monthly income. This could be due to the fact that educated mothers have enough money to buy breast milk substitutes and the possibility that they spend much of their time away from home as learners or as salary employees. This agrees with the finding in the study done in Botswana 1983/84 (2).

In conclusion, majority of children started supplementary diet before the age 4 months and since the study was conducted in an urban setting, the majority of mothers who practiced bottle-feeding had a chance to visit health institution during pregnancy or delivery, but only few of them were advised on benefits of breast-feeding. It is therefore suggested that health education on importance of exclusive breast-feeding for the first 4 months and reorientation of health workers at all levels on promotion of breast-feeding practice is strongly recommended.

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REFERENCE

1. Hambrcus L. Proprietary milk versus human milk in infant feeding. *The Pediatrics Clinic of North America*. 1994; 24: 1
2. Owour L, Omondi L, Pearson A, Staugard. Determinants of breast feeding and bottle feeding in Botswana. *Journal of Tropical Pediatrics*. 1990; 36: 28-33.
3. Tigist K, Derege K, Chanyalew B, Hana N. Breast feeding in Addis Ababa, Ethiopia; Result of focus group study. *Ethiop. J. Health. Dev.* 1996; 10: 133-143.
4. Whitehead RG, Paul AA. Nutritional needs of healthy infants, In: Stanfield P, Brueton M, Chan M (ed), *Disease of children in subtropics and tropics*. ELBS, Edward Arnold, London, 1991.
5. Ebrahim GJ. Practice of Child and Mother Health in the developing countries. A manual for community health nurses and rural health workers, 4th edn. ELBS, McMillan, Hong Knong, 1991.
6. Ronald L, Kleinman F, Karen B. Breast feeding, Fertility and contraception, 1984: pp 31-33: 3.
7. Meehan KF. Breast feeding in urban district of Shangi, China. *Journal of Tropical Pediatrics* 1990; 36 (2): 75-9.
8. Tadesse E. National breast-feeding survey in Ethiopia. Knowledge, attitude and practice among Mothers and health professionals, History of health and UNICEF, 1993, Addis Ababa, Ethiopia.
9. Bradley J. Breast feeding promotion in Kenya: change in health worker knowledge, attitude and practice, *Journal of Tropical Pediatrics*, 1992; 38 (5): 228-34
10. Ketsela T, Kebede D. Pattern of Infant Feeding in Addis Ababa Ethiopia, *Ethiop. J. Health. Dev.*, 1992; 6: 55-7
11. Tema T. Knowledge, attitude and practice towards exclusive breast feeding in Jimma town, *Ethiop. J. Health. Sci.* 2000; 10: 7-13
12. Woldetensai Z. Infant feeding practice and risk of diarrhea, bottle feeding in rural Ethiopia, *Bulletin of Jimma Institute of Health Science*, 1996; 6(1): 97-98
13. Friesen H. Infant feeding practice in Papua New Guenea. *Annals Tropical Pediatrics*. 1988; 18 (3): 209-15.
14. Bekele S. Breast Feeding Practice among factory working mothers and house wives in Akaki Beseka (1986).
15. Maradi A, Afzali HM, Hossani AF. Reason for Early Weaning Among Mothers in Teheran, Iran, *Bulletin of WHO*. 1993; 71 (5): 561-9.