

Determinants of Weaning Practices

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Abstract: A community-based cross-sectional survey was conducted on 334 mother-child pairs of 0-2 year old children in a semi-urban sub-district of Adigrat, Tigrai, Ethiopia. A cluster sampling technique was used to select clusters. The study was undertaken to assess weaning practices in the area and to identify the determinants. A questionnaire comprising both open and close-ended questions was used to collect information. This study has shown early commencement of weaning. The median age at commencement of supplementary diet was three months, and the age range was 1-6 months. More than two-thirds of mothers started supplementary diet before the age of four months. Working mothers had higher chance of early weaning compared to housewives (OR=3.5; 95%CI=1.61,8.14). Similarly, better income mothers had higher chance of early weaning compared to poor mothers (OR=2.2; 95%CI=1.17, 4.06). The most commonly and frequently used foods for child weaning were adult diet (ingera, Kitta, and bread), followed by porridge-gruel and egg. Feeding was so infrequent that about half of the children were fed only once and 95% of them 1-3 times in the previous day. Consumption of vegetables and fruits was very rare. In this study the prevalence of bottle-feeding in infants was 20%. Mothers working outside home had about three times higher chance of bottle-feeding compared to housewives (OR=2.87, 95%CI 1.16, 7.101). [*Ethiop. J. Health Dev.* 2000;14(2):183-189]

Introduction

Weaning, a transitional period from breast-feeding to adult diet is usually associated with a number of concerns and problems in developing countries. The major concerns are what foods should be given to the child and how and when they should be given (2). It is now generally accepted that there are no physiological, economic, psychological, or nutritional advantages to early introduction of weaning foods. However, late weaning is a major problem since breast-milk ceases to be adequate to meet the infants' needs between the ages of four and six months.

In developing countries, the age at introduction of weaning foods is of public health importance because of the risk of diseases, particularly diarrheal diseases from contaminated weaning foods, and the risk of growth faltering and malnutrition from delayed weaning(3). The age at introduction of

weaning foods varies and is influenced by the tradition of the different ethnic populations in the country, urbanization and the socioeconomic status of households. In urban areas, the tendency is early weaning, but in some rural areas weaning is delayed up to one year or more (4,5,6).

In traditional societies special foods for the weaning-age-child are seldom prepared (6). The child slowly gets accustomed to the adult food through the softer, carbohydrate parts of that food. In recent years some countries have introduced home-made weaning foods, like 'FAFA' in Ethiopia. However, such products reach only limited portion of the population for reasons of economic and geographic inaccessibility.

During the last few decades an increase in the use of bottle-feeding has been observed in developing countries. This use has been shown to interfere with breast-feeding and has increased the risk of child mortality and morbidity (13). A study in 13 African countries found, bottle use rate of 2.2% to

47% infants aged under six months. The association of bottle-feeding with some differentials was also analyzed and it was shown that, in all countries, bottle use was higher in urban compared to rural areas, and also associated with increased level of maternal education.

The aim of the study was thus to determine the child feeding practices in children 0-2 years old and identify influencing factors.

The specific study objectives were to:

- estimate average age at weaning
- determine the type and feeding frequency of commonly used weaning foods
- determine prevalence of bottle feeding
- identify determinants of these practices

Methods

Study area: Adigrat, the study area is a semi-urban sub-district situated in Eastern Tigray having a population of 38, 427. The town is divided into seven administrative localities. Each locality is further sub-divided into 4-5 sub-localities with a population ranging between 1000 and 1200.

Sampling: A community-based cross-sectional study on the time of breast-feeding initiation, and prevalence of colostrum and prelacteal feeding practices and their determinants were conducted among 334 mother-child pairs. The mothers were selected on the basis of their youngest living children aged between 0-2 years at the time of the survey. The sample size was calculated using a simple prevalence formula (11). The sample size was determined at 10% desired level of precision. The 1997 projected population of the 32 localities was obtained and the 0-2 year old population estimated. The study was conducted in 30 of the 32 sub-localities. The clusters were selected using probability-proportional-to-size method (12). The first house in each of the clusters was selected using the 'spin the bottle technique and counting to the edge of the cluster' and the subsequent houses were taken by serial proximity until the required sample

size was obtained in each cluster (13).

Data collection: A questionnaire was developed following a literature review, community discussions, and a pilot study. The questionnaire contained both open and closed-ended questions. Ten trained interviewers, one supervisor, and the investigator collected the data. The response rate was 95%.

Data analysis: The data was analyzed using JMP-IN (a version of SAS software system) and EPI-Info-version 6 computer packages. Descriptive statistics was used to illustrate the socio-economic and demographic characteristics of the study population. The prevalence of early and delayed breast-feeding initiation, colostrum, and prelacteal feeding practices was calculated.

The chi-square(χ^2) was used to determine if there were statistically significant associations between the different breast-feeding practices of the index children and the socio-economic and demographic characteristics of the mother, father and family. Comparisons and associations were considered statistically significant when the two-sided p-value was less than 0.05. Logistic regression models were used to identify the most important predictors of colostrum-feeding. A forward stepwise logistic regression model included all variables with p-values <0.1. The odds ratios (OR) and their 95% confidence intervals for each variable were derived through the regression analyses.

Definitions: Operational definitions used in this study:

- Weaning food is any food items including water given after the age of four months
- Early weaning is when supplementation of foods in addition to breast-feeding started before the age of four months.
- Correct weaning is when additional food is supplement between the age of and months
- Delayed weaning is when additional food is supplemented after the age of four and six months.

- Bottle-feeding is considered when was ever use of bottles for the index child-feeding.

Result

Characteristics of index children: The mean age of children included in the survey was 10.99 (SD±6.58) months, and the median age was 11 months. The youngest child was two days and the oldest 24 months. The age of index children was grouped into six categories based on ideal feeding practices for the particular group. The numbers in each group and the proportion by gender are presented in Table 1. The sex ratio was 1.02 (male to female).

Characteristics of mothers: The mean age of mothers included in the survey was 26.8 (SD±6.5) years and the median age was 27 years. The youngest mother interviewed was 16 years and the oldest mother was 45 years. Maternal age was grouped into four categories and the proportion in each category is presented in Table 1. This table also groups mothers according to marital status and levels of education. Two hundred and thirty eight (75%) of the surveyed mothers were working at home, 41 (13%) worked on a day basis, nine (3%) were self-employed while only 29 (9%) were employed by the government.

Characteristics of husbands/fathers: The respondents were questioned about their husbands' educational status and occupation. The husbands' educational attainment is also included in Table 1. It is interesting to note that 7% of husbands had attended a higher education institution compared to only 1.35% of their wives. One hundred and forty four (44%) husbands were under-employed as they were only employed when work was available, 80 (26%) were self-employed, and 89 (28%) were employed by the government.

Characteristics of family: The average family size was five. Three hundred and seven (97%) of the families were Christians and the remainder Muslims. The respondents were questioned about their family income, and

whether they received food aid or not. Respondents when questioned were reluctant to admit their total income. Food support proved a more reliable method of assessing whether families had a low income or not. Food support is distributed to those families who are 'extremely poor,' according to local criteria. One hundred and five (33%) of families in this survey received food support.

Table 1: Socio-economic and demographic characteristics, Adigrat, 1998.

Characteristics	Number	Percent
Childrens' age (n = 317) in months		
0-4	50	15.8
4-6	45	14.2
7-9	49	15.5
10-12	52	16.4
13-18	74	23.3
19-24	47	14.8
Mothers age (n = 316) in years		
16-19	29	9.2
20-24	97	30.7
25-34	137	43.4
35-45	53	16.8
Marital status (n = 317)		
married	263	83.0
single	25	7.9
divorced	25	7.9
widowed	4	1.3
Mothers education (n = 317)		
illiterate	119	37.5
semi-literate	39	12.3
primary school	86	27.1
secondary school	69	21.8
third level	4	1.3
Family income (n = 317)		
extreme poverty/low income	105	33.1
others	212	66.9

Age at weaning: At the time of the survey 188 (71.2%) children were receiving supplementary feeding besides breast milk. Mothers who had started supplementary feeding were asked at what age this was started. The mean age at commencement of

Table 2: Distribution by age of commencement of weaning, Tigrat, 1998

Age in months	No	%
less than 4	165	68.5
4-6	76	31.5
7 and above	0	0.0

supplementary diet was 3.3 (SD±0.79) months and the median age was 3.0 months. The age range was 1-6 months. Table 2 indicates the median age and grouped distribution of the age of commencement of weaning.

The age of weaning was classified into three groups: early, correct and late. This was analyzed to determine if there was any association with the different socio-economic and demographic characteristics of the mother, father, family, and the child.

There was significant association between early weaning and mothers education, parity and occupation as well as family income and fathers education. Mothers having a better educational status tended to wean early in contrast to illiterate or lower educational status of mothers, and the differences were statistically significant ($\chi^2_{trend} = 12.78, p=0.0003$). A larger proportion of mothers who worked outside home started weaning early compared to housewives ($\chi^2 = 11, p=0.001$). Mothers who had one birth formed early weaning compared to mothers who had more than one birth, and the difference was statistically significant ($\chi^2 = 11, p=0.0194$). Similarly children of fathers of better educational status were found to weaned early compared to their counterparts, with a statistically significant difference ($\chi^2_{trend} = 7.38, p=0.006$). Children of better income families weaned early compared to their counterparts ($\chi^2 = 11, p=0.008$).

To find the most important predictors of early weaning, variables significantly associated with early weaning were analyzed further using logistic regression model. A forward step-wise logistic regression strategy at 10% level of significance for entry was used. Only mothers occupation and family income were significantly associated with early weaning. Mothers working outside home had 3.5 times higher chance of early weaning compared to house wife mothers ($p=0.0025$). Similarly, mothers of better income had two times higher chance of early weaning compared to poor mothers ($p=0.0145$).

Weaning Foods: In order to identify the common foods used for weaning, respondents were asked what types of foods had been given and the frequency of feeding in the previous 24 hours prior to the survey. As indicated in Table 4, the most commonly and frequently used food for child feeding was the adult diet,

Table 3: Early weaning by socio-economic variables (logistic regression model), Adigrat, 1998.

	OR	95%CI	P-value
Mothers' education			
Illiterate and read and write only	1		
Primary school	1.91	0.9738,3.8647	0.0638
Secondary and above	2.21	0.9515,5.512	0.0737
Family income			
Extreme poor	1		
Others	2.17	1.169,4.0614	0.0145
Mothers' occupation			
House wives	1		
Work outside home	3.45	1.6105,8.143	0.0025

Whole model $\chi^2 = 28.92$ with $df = 4, p < .0001$

Table 4: Last 24 hour child feeding recall of mothers, by type of food and frequency of feeding, Adigrat, 1998.

Food item	Once		2-3 times		4-6 times		Total	
	No	%	No	%	No	%	No	%
adult diet	60	33.9	70	44.9	25	44.6	155	39.8
semisolid	57	32.2	48	30.8	10	17.9	115	29.6
egg	33	18.6	8	5.1	41	10.5	82	21.1
milk	11	6.2	15	9.6	20	35.7	46	11.8
meat	5	2.8	7	4.5	12	3.1	24	6.2
pasta	11	6.2	8	5.1	1	1.9	20	5.1
Total	177	45.5	156	40.1	56	14.4	389	

Note:- column percentages show frequency of feeding and raw percentages types of foods

- the total raw % adds up to more than 100% as some of the children ate more than on type of food item

- adult diet include injera, bread and pancake (Kitta)

- semisolid include porridge and gruel

consumption of vegetables and fruits

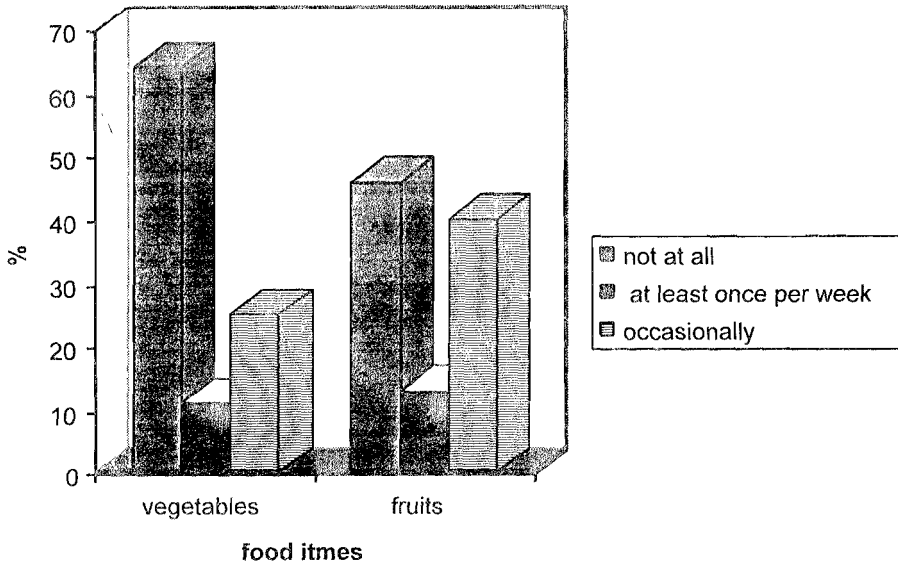


Figure 1: Proportion of children who received vegetables and fruits

followed by porridge/gruel and cow's/ formula milk. The widely used adult food is a locally prepared pancake (injera) made from a local cereal.

Vegetables and fruits; Vegetables and fruits are necessary primarily for the prevention of diseases and deficiencies in the human body. However, only 54% of the children received fruits at least once per week or occasionally, and the remaining 46% did not receive any. Similarly, only one-third of children received vegetables and more than two-thirds of them did not receive vegetables (Figure 1).

Bottle-feeding: of the 308 respondents, 67 (22%) of them had used bottle-feeding for their youngest child, the remaining 241 (78%) did not use a bottle. Of the 162 with children less than one year old, 33 (20%) of them had used bottle-feeding at least once.

The practice of bottle-feeding in children less than one year old was analyzed with the different socio-economic and demographic variables to determine if there was significant association.

Mothers' educational and occupational status, fathers' educational status, and family income

status were significantly associated with bottle-feeding practices. As maternal educational status increased, so did the likelihood of bottle-feeding ($p=0.0033$). A larger proportion of mothers who worked outside the home bottle-fed compared to mothers who worked at home. The difference was statistically significant ($p=0.0006$).

To determine the important predictors of bottle feeding, significantly associated variables were analyzed using a logistic regression model. A forward stepwise strategy at 10% significance level for entry was used.

Mothers' education and family income status lost significance as bottle-feeding predictors. However, occupation of mothers was significantly associated with bottle-feeding. Mothers working outside the home had about three times higher chance of bottle-feeding compared to housewives ($p=0.0212$).

Discussion

One important limitation of this study is recall bias due to the retrospective nature approach to data collection and the routine day- to- day practice of feeding. This might lead to over/under estimation of the actual practice. However, to minimize the bias, training and supervision of interviewers was undertaken.

Breast-feeding alone is sufficient to nourish a child for at least the first four months of life. WHO/UNICEF(7,8) and other investigators (9) recommended that other food or fluid before the age of four months is unnecessary. In this study, however, the average age at which supplementary diet was given to the index child was three months, the range being 1- 6 months. More than two-thirds of mothers started supplementary feeding before the age of four months. Commencement of supplementary feeding in this study is earlier compared to other study findings (5,10). A similar study in Butajira(12) reported 29% commencement of weaning before the age of four months which is much lower than the finding in this study (68.5%). This difference could partly be explained by the strict operational definition used to define weaning food which considers water as food in this study. Moreover, the study subjects in this study were from semi-urban where early commencement of weaning is expected to be higher for various socio-economic reasons compared to rural communities. In this study there was no child supplemented after the age of six months. However, a similar study in Butajira indicated late weaning of 30%. Similar explanations as for the early weaning could apply to this difference.

Family income and the mothers' occupation were significantly associated with early weaning. Mothers from better economic status had 2.2 times higher chance of early weaning compared to mothers from a poor family ($p=0.0145$). Similarly, working outside the home had 3.5 times higher chance of early weaning compared to housewives, ($p=0.0025$). This indicates that regardless of

their educational and income status, mothers working outside the home are more likely to wean early.

The last 24 hours dietary recall in this study identified adult diet as the most commonly used food for child feeding. This is less nutritious and unsuitable for children to eat. Feeding was very infrequent that about half of the children were fed only once and 95% of them 1-3 times per day. It is surprising that no child was fed FAFA, a commercial weaning food of Ethiopia, or any other formula products. Vegetable and fruit consumption was also very rare.

This study has identified the common weaning foods in the area. However, assessing the adequacy of weaning foods in terms of quantity and nutrition content was beyond its objectives and further study is required to complete this aspect.

The adverse health effects of bottle feeding in the hands of poor mothers and the effects on the household resources have prompted the global campaign against the use of bottle feeding. This study, however, has shown 20% of bottle feeding in infants. This rate is lower compared to the bottle feeding rate of infants of under six months old in poor urban dwellers of Addis Ababa (11), but slightly higher than the average bottle- feeding rate in Sub-Saharan countries(13).

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