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Factors Influencing Infant Feeding Patterns in Sri Lanka.

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SUMMARY. Early introduction of formula milks during infancy is one of the major changes that have been observed in the infant feeding patterns of both developed and developing countries.

A community based study of infants in urban, town and rural sectors of Sri Lanka indicates that the early introduction of formula milks is a common phenomenon, specially in urban areas. The importance of urban residence, higher educational level of the mother and employment of the mother outside the home are the factors favouring early introduction of formula milks.

INTRODUCTION

Even though infant nutritional problems are of multifactorial origin, an important association has been observed between malnutrition in early childhood and the rapid decline in breastfeeding observed in many developing countries[2]. This changing pattern of infant feeding is due to early introduction of milk formulas.[7] The effects of such an action could be varied.

Several studies have shown that, except for a short period following childbirth, continued milk production depends primarily on suckling.[1,3] With the introduction of milk formula, the frequency of suckling is likely to be reduced, thus interfering with milk production.

Protection afforded by breast milk against infections through the provision of several host resistance factors is well documented[9]. Such protection could be reduced with the introduction of formula. Bacteriological contamination of milk and feeding of diluted formulae have also been observed in developing countries.[12] Both these factors are likely to contribute to the higher incidence of infections leading to deterioration of nutritional status. Such observations have been made in both developing and developed countries.[3,5]

Increased use of formula is likely to have an impact on the economy, at the family level as well as at national level[10] thus indicating wider implications of early introduction of formula. As the introduction of formula becomes common practice, it is necessary to study the factors that are likely to influence such feeding practices among mothers of young children.

MATERIALS AND METHODS

A cross-sectional study on infant feeding practices was carried out in twelve of the twenty four districts of Sri Lanka. 'Urban, 'Town' and 'Rural' sectors were identified from the census data available. Thirty clusters were then randomly selected from each sector, using the technique of sampling of "probability proportional to size". From each cluster, a census block was randomly selected and a group of 30 children whose age was one year or less were identified within each of these clusters. Thus, approximately, 900 mother-child pairs were included in the study from each sector.

In the selection of the rural areas, some of the estate areas were also included in the sample. Of the 30 rural clusters, 9 were from the estate areas. The socio-economic characteristics of the residents of the estate areas differ from the rest of the rural areas in Sri Lanka in that most of them worked in the estates as labourers, were of Indian Tamil origin and were Hindus.

A group of Family Health Workers were trained to administer the pre-coded questionnaire. Field supervisors were responsible for checking the data and supervising the field work. The data were checked manually and edited using the computer before analysis.

RESULTS

Ninety-eight percent of mothers in the urban and town sectors and 99% in the rural sector had initiated breastfeeding. Early introduction of other milks specially powdered milks was done by most mothers, as it was observed that, by the time the infant completed three months of age, 55% of urban, 53% of town and 40% of rural mothers had introduced formula milk (Table 1). However, the proportion of mothers who completely discontinued breast milk was much lower for all age groups, this difference being most marked in the rural sector.

TABLE 1. **Prevalence of exclusive breast feeding, 'mixed' feeding and 'formula' feeding**

	Age of child in completed months			
	3 months	6 months	9 months	11 months
% exclusively breast-fed				
Urban	45	24	16	20
Town	47	26	24	17
Rural	67	49	44	32
% on 'mixed' feeding				
Urban	33	42	33	30
Town	31	46	40	46
Rural	28	46	47	50
% on 'formula' feeding only				
Urban	6	33	49	50
Town	5	28	36	37
Rural	0	5	9	18

Reasons for the introduction of other milks were inquired into, from mothers who had done so. Table 2 shows that 'not enough milk' is the commonest reason given, with 'getting back to work' being the next in order of importance. Ill-health of the mother or the child were considered important only in a very small proportion.

TABLE 2. **Reasons for regular supplementation**

Reason	Urban		Town		Rural	
	n	%	n	%	n	%
Not enough milk	409	69	391	70	310	69
Mother ill	33	6	30	5	13	3
Child ill	11	2	8	1	5	1
Getting back to work	78	13	82	15	98	22
Other reasons	60	10	47	9	24	5
Total	590	100	558	100	450	100

Marked differences between the sectors were observed in the proportion of mothers who introduced formula, the urban sector having the highest and the rural sector the lowest (Table 3).

TABLE 3. **Relationship between place of residence and introduction of formula**

Sector	Introdced Formula		
	Yes	No	Total
Urban	591	319	910
Town	558	354	912
Rural	450	457	907
Total	1599	1130	2729
	chi square 47.6	d f 2	P< 0.001

The influence of some socio-demographic variables were studied separately for the three sectors. Table 4 indicates that the proportion of mothers who introduced formula increased with the level of education. Even though these differences are seen in all three sectors, they are statistically significant in the urban and town sectors only. On the other hand, the age of the mother does not seem to significantly influence the decision to introduce formula feeding (Table 5). More of the mothers with one living child seem to introduce formula, even though these differences are not statistically significant (Table 6).

TABLE 4. **Relationship between educational status of the mother and introduction of formula**

Educational status of the mother	URBAN		TOWN		RURAL	
	Introduced formula Yes	No	Introduced formula Yes	No	Introduced formula Yes	No
Illiterate	30	25	17	23	73	63
<Grade V	92	66	94	92	123	144
Grade V — GCE (OL)	296	164	297	166	174	193
Passed GCE (OL)	114	40	108	58	55	41
Passed GCE (AL) & above	53	21	38	15	19	11
Total	585	316	554	354	444	452
	chi square 13.2 p< 0.025 significant		chi square 19.255 p<0.01 significant		chi square 7.31 p<0.05 n.s.	

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TABLE 5. **Relationship between age of the mother and introduction of formula**

Mother's age in completed years	URBAN		TOWN		RURAL	
	Introduced formula Yes	No	Introduced formula Yes	No	Introduced formula Yes	No
13 — 17	9	10	8	7	6	6
18 — 22	111	83	118	89	59	89
23 — 27	215	99	164	113	141	156
28 — 32	156	82	138	86	134	117
⩾33	100	45	130	59	110	89
Total	591	319	558	354	450	457
	chi square 8.5 d f 4 p>0.05 n.s.		chi square 7.957 d f 4 p>0.05 n.s.		chi square 9.01 df 4 p>0.05 n.s.	

TABLE 6. **Relationship between number of living children and introduction of formula**

Number of living children	URBAN		TOWN		RURAL	
	Introduced formula Yes	No	Introduced formula Yes	No	Introduced formula Yes	No
1	267	114	227	127	156	147
2	162	105	143	101	105	129
3	84	54	86	61	84	98
4	41	26	52	28	50	44
⩾ 5	37	20	50	37	55	39
Total	591	319	558	354	450	457
	chi square 8.3 p >0.05 n.s.		chi square 3.17 p >0.05 n.s.		chi square 6.56 p >0.05 n.s.	

Employment status of the mothers influences the feeding pattern of infants in all three sectors, as shown by the significantly high proportion of employed mothers who introduced formula (Table 7). The influence of religion of the mother seems to be less important in the urban and the town groups, whereas in the rural sector the proportion of Hindu women introducing formula is significantly higher than those for the other religious groups (Table 8).

TABLE 7. **Relationship between mother's employment status and the introduction of formula**

Employment status	URBAN		TOWN		RURAL	
	Introduced formula		Introduced formula		Introduced formula	
	Yes	No	Yes	No	Yes	No
Working	92	18	97	15	147	56
Non-working	499	301	461	339	303	401
Total	591	319	558	354	450	457
	chi square 19.9 df 1 $p < 0.001$		chi square 34.4 $p < 0.001$		chi square 52.2 $p < 0.001$	

TABLE 8. **Relationship between 'religion' of mother and introduction of formula**

Religion	*URBAN*		*TOWN*		*RURAL*	
	Introduced formula		Introduced formula		Introduced formula	
	Yes	No	Yes	No	Yes	No
Buddhist	298	181	361	237	315	380
Hindu	83	46	21	16	100	52
Muslim	89	43	78	34	14	9
Christian (non RC)	48	20	22	13	3	3
Roman catholic	71	28	66	50	18	13
Total	589	318	548	350	450	457
	chi square 4.98 $p < 0.05$ NS Inadequate information 16		chi square 5.565 $p < 0.05$ NS		chi square 29.78 $p < 0.005$	

DISCUSSION

This study was done on a randomly selected sample of infants, residing in twelve of the twenty-four districts in Sri Lanka and hence is not nationally representative. Accordng to the Census data, approximately 70% of the population of Sri Lanka live in the districts included in the study[11].

The World Fertility Survey (WFS), carried out in Sri Lanka in 1975, collected information on breastfeeding from a nationally representative sample of women.[1] This study did not differentiate between exclusive breastfeeding and partial breastfeeding; hence those identified as 'breastfeeding' included both these categories.

Although the two studies are strictly not comparable, it might be useful to find out to what extent the findings in the present study (carried out in 1981/82) agree with those made in 1975 since many changes in the socio-economic *milieu* have taken place during the intervening period.

The data from the WFS were analysed using a probit model to find out the significant socio-economic factors that influence breastfeeding. Urban residence, higher level of education, working away from the home and higher maternal age were identified as the factors having a negative influence on breastfeeding during the first nine months of life.

The importance of urban residence, higher educational level and employment outside the home as factors favouring the introduction of formula milks, is clearly seen in the present study too. However, the age of the mother and the number of living children do not show a significant influence. It is also seen that a significantly high proportion of Hindu mothers from the rural sector introduced formula milks, even though no significant differences were seen between the religious groupings in the urban and the town groups. One reason for this observation is the inclusion of nine clusters from the 'estate' areas among the thirty rural clusters, whereby a high proportion of Hindu mothers were included. As a majority of women in the estates are Hindus who work away from home, they may have felt the need to introduce formula milks, even though they are entitled to maternity leave after delivery.

Urban-rural residence seem to have the most consistent effect on infant feeding practices as seen by studies in many parts of the world. [6,14] In most developing countries, the better educated a woman is and the higher the socio-economic status, the less likely she is to continue exclusive breast feeding. [4,8]

From the evidence available, the association observed between urbanization, higher level of education and the practice of formula feeding cannot be considered "causal." However, they do indicate that the overall practice of exclusive breast feeding is likely to decline in situations where urbanizing influences prevail, unless other changes counteract them.

The higher possibility of urban educated mothers introducing artificial feeding could be due to many factors. They are more likely to be exposed to advertising compaigns (even though advertising of infant milks has been banned in Sri Lanka since 1984) and to social pressures leading to the development of different "social values". On the other hand, pressure on their time by having to attend to household and children's activities by themselves may also induce some mothers to seek alternate methods of infant feeding which gives them greater mobility.

Urban mothers are the group at whom activities geared towards promoting breast feeding need to be aimed and the social factors which may influence such decisions need to be taken into consideration in such promotional activities.

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