

Effect of Nutrition Education of Mothers on Infant Feeding Practices

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Abstract. Objective : To assess current infant feeding practices (IFP) in a relocated slum, to identify the lacunae, to outline, implement, and evaluate the gain in awareness and IFP followed by mothers. **Methods.** Thirty-five mothers of infants aged 5-19 months were interviewed. Based on lacunae, Nutrition Education (NE) was imparted to mothers over two months. Tools used were individual counseling, participatory learning methods, positive deviance and early adopters approach aided with existing information education communication materials. Monthly weight and length of infants was also taken. Awareness and practices on infant feeding (IF) were reviewed at mid and post NE. **Results.** Areas of concern at baseline were (i) discarding colostrum (77.0%), (ii) feeding prelacteals (80.0%), (iii) initiation of breast-feeding (BF) after 3 days (54.3%), (iv) absence of exclusive breast-feeding (86.3%), (v) delayed complementary feeding (CF) and (vi) feeding CF grossly inadequate in quality, quantity, frequency and consistency. Post NE results revealed an improved awareness about IF amongst the mothers. An improvement was seen in variety, quantity and consistency of CF fed. Active feeding behaviours were adopted (6.6% pre-NE vs 66.6% post-NE). Early adopters (24%) served as motivators. Weight for age and weight for length showed improvement. **Conclusion:** NE programs of shorter duration using a 'communication mix' of channels with repeated reinforcement can bring about improvement not only in awareness but also in IFP. [Indian J Pediatr 2003; 70 (6) : 463-466]
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Poor infant feeding practices (IFP) directly or indirectly contribute to undernutrition, morbidity and mortality in infants. Sometimes, the lack of awareness and not poverty *per se* may be the likely cause of faulty IFP. In view of evidence that nutrition education (NE) empowers a mother to maximize the resources around her, for the health of her child,¹ the present action research study was carried out keeping the following objectives in mind: (a). To assess current IFP adopted in a relocated slum of Delhi (India) and identify the lacunae. (b). To outline and implement a 'need-felt' NE program (c). To evaluate the gain in awareness level and practices of mothers pertaining to IFP as an outcome of the NE communication strategy used.

MATERIALS AND METHODS

Baseline Design : A relocated slum of Delhi (India) was selected purposively. Thirty-five mothers of infants aged 5-19 months were identified purposively through domiciliary visits. Detailed information was gathered from the mother on current IFP using a pretested interview schedule.

Intervention Design : Lacunae found in the practices formed the basis of the NE program, designed and

executed on 30 mothers over a period of two months. A 'communication mix' channels were used to impart NE. These included individual counseling, Participatory Learning Methods (PALM), Focused Group Discussion (FGD), songs and street plays on NE. Two new approaches were also used. These included positive deviant (PD) and early adopters (EA) approach. Key channels to impart messages were aided by using existing Information Education Communication materials (posters, flash cards, growth chart (UNICEF-Mamta Card) and stories. Messages were imparted in form of 5 FGD's, 10 home visits, and one 3-day workshop such that all the study subjects received equal sessions. Growth status of infants was assessed on the basis of monthly anthropometric measurements (weight and length) taken pre, mid and post-NE. Standardized techniques and precautions were used.²⁻⁴ A spring balance (Libra A-014792) with accuracy upto 50 g was used for taking the weight and an infantometer with accuracy up to 0.5 cms was used for measuring the crown heel length of the infant.

Description of Evaluation : Pretested indicators were administered to the subjects after one and two months of intervention to assess the improvement in awareness and IFP. Thus each subject served as his or her own control. Two methods were used to study the progress in anthropometric status of the infants. In the first method, the indicators of the index child were compared pre and

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post-NE. In the second method, the index child after two months of NE was compared with a child of the same age when the mother had not received any NE at that point in time (*servicing as a 'control'*).

Data Presentation : The data on knowledge and IFP followed pre, mid and post-NE was calculated as frequencies. For relating the weights and lengths to the reference data indices like weight for age, weight for length and length for age were constructed and compared to the United States National Council of Health Statistics (NCHS) standards as recommended by WHO.⁵ The infants were classified using standard deviation scores (Z-Scores) of the reference NCHS median.

RESULTS AND DISCUSSION

1. Background Information : This relocated slum neither had basic primary health care facilities nor any NE program targeting infant nutrition. With meager resources and an average family size of five, living conditions were poor.

2. Infant Feeding Practices : Areas of concern at baseline emerged as discarding colostrum (77.0%), feeding prelacteals (80.0%), initiation of breast-feeding (BF) after

3 days (54.3%), absence of exclusive BF (86.3%), delayed introduction of complementary foods (CF) and feeding CF grossly inadequate in quality, quantity, frequency and consistency. Discontinuing BF in maternal illness and CF in child illness was also observed. Other Indian studies have also shown a similar trend.⁶⁻⁸ Lack of awareness emerged as the root of poor IFP. PD behaviours identified were: Three mothers fed a modified family pot energy dense food to their infant; of these supervised bowl feeding was adopted by two mothers and father of an infant took extra initiative in health of his infant.

3. Changes Brought About by the NE Program

3a. Changes in Awareness : There was improved awareness in several aspects of infant feeding during the course of NE intervention (Table 1). Similar findings have also been reported earlier.⁹

3b. Changes in Practice : Success was achieved to motivate mothers who had not initiated CF pre-NE (10 mothers) to initiate CF by mid-NE. Cereals (rice, wheat, bread) and pulses were included in the diet of infants by nearly all mothers post-NE. Green Leafy Vegetables were incorporated in the diet by 80% at post-NE as against only 20% pre-NE. Half (50%) the mother tried to increase the

TABLE 1. Percentage of Mothers Aware of the Emphasis Behaviours at Pre, Mid and Post-NE

	Pre-NE		Mid-NE		Post-NE	
	%	No.	%	No.	%	No.
A. Breast Feeding						
1. Initiation within the first hour	23.3	(7)	86.6	(26)	100	(30)
2. Colostrum is necessary	20	(6)	93.4	(28)	100	(30)
3. Exclusive BF (0-6 months)	30	(9)	76.6	(23)	86.6	(26)
4. Prelacteals are not necessary	20	(6)	86.6	(26)	96.6	(29)
5. BF continued till at least 2 years	36.6	(11)	76.6	(23)	76.6	(23)
B. Complementary Feeding						
1. Initiation at about 6 months	16.6	(5)	100	(30)	100	(30)
2. Feeding 6-9 months : Starting with 10tsp/d and gradually increasing the quantity	0	(0)	20	(6)	53.3	(16)
3. Feeding 9-12 months : Starting with 21/2 katori per day and gradually increasing the quantity	0	(0)	20	(6)	33.3	(10)
4. Consistency : thin and mashed (6-9months) and thick and mashed food (9-12 months)	30	(9)	70	(21)	86.6	(26)
5. Types of CF which can be given to the infant						
Rice	33.3	(10)	70	(21)	86.6	(26)
Chapati/wheat	40	(12)	73.3	(22)	90	(27)
Pulse	76.6	(23)	96.6	(29)	100	(30)
Green leafy vegetables	16.6	(5)	56.6	(17)	76.6	(23)
Milk	43.3	(13)	69	(18)	66.6	(20)
Fruit	30	(9)	63.3	(19)	86.6	(26)
6. Frequency of CF						
Feeding > 3-4 times a day	6.6	(2)	46.6	(14)	63.3	(19)
7. Feeding in illness						
Preparation of ORS	30	(9)	66.6	(20)	90	(27)
BF when mother is ill	20	(6)	76.6	(23)	80	(24)
8. Hygienic practices						
Boiling water before use	30	(9)	83.3	(25)	83.3	(25)

() = Number of mothers

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quantity of complementary foods fed through 2 months of NE. Fifty percent mothers initiated in between meal feeding two times a day by post-NE. Food given to the infants was of thick and mashed consistency by 56.6% of the mothers' post-NE as against only 3.3% at pre-NE. Most mothers (72%) adopted supervised bowl feeding by post NE. Mothers (66.6%) adopted active feeding behaviours after 2 months of intervention as compared to only 6.6% mothers practicing this behaviour at pre-NE. Feeding homemade ORS to the infant in times of diarrhoea was adopted by 46.6% of mothers. However the quantity of CF given in illness did not increase by post-NE. Similar findings have been reported earlier.¹⁰ Many mothers (43.3%) adopted boiling water before use and only 16% mothers adopted washing the infant's hands and their own always, before and after feeding. Probably consistent efforts with a more number of reinforcements in this area would motivate action in the desired direction.

3 c. Changes Observed In Nutritional Status : Many (73.3%) infants had their wt/age below minus 2 SD of the NCHS median at baseline and this decreased to 66.6% by post-NE. The proportion of infants with wt/age less than minus 2 SD of NCHS median decreased from 35.4% to 2.5% after 2 months of NE. Mean Z scores for weight for age and weight for length of NE exposed group were better than for 'controls' (Table 2). Similar NE intervention studies have reported that children in the intervention group weighed more than the control groups.^{11,12} Length for age of group exposed to NE as compared to the control' did not show improvement. Length for age is indicative of chronic malnutrition and a two-month period is not sufficient enough to bring about a positive change in length.

4. The Effective Communication Mix for Nutrition Education

A mix of communication channels enabled reinforcement of the messages where FGDs enabled exchange of views; individual counseling allowed negotiation and feedback; street plays and songs served as effective energizers for reinforcing the key messages and food demonstrations given on modifications of family pot food were easily accepted.

EA approach was a new concept experimented in this study. The triggering point for study subjects to become EAs was when they visually saw improvements in the health of their infant after following the emphasized behaviours and it is then that they were motivated to follow the behaviour and were motivated further to act as facilitators to the rest of the group. Some field experiences using such an approach were : Mrs. X started CF to her 7-month-old daughter after attending the NE program. After one month of practicing 'doable' behaviours like feeding ½ bowl soft mashed food thrice a day, adding ½ tsp of oil in the infant's food, boiling water before use she noted that her daughter who weighed only 4.7 kgs at baseline gained 1.5 kgs in one month (mid-NE) and complained of less frequent episodes of diarrhoea. She said, "I practiced whatever you told me and my child is better now". She motivated two other participants to increase the quantity of food fed and boil water before use. Another EA, having studied till 5th standard, was able to understand the growth chart; she took initiative to teach the interpretation of colours and direction of wt/age progression to the remaining mothers in the meeting. Three other EAs prepared premixes (cereal + pulse combination) they learned during food demonstrations,

TABLE 2. Comparison of Mean Z Score (of NCHS Median) Distribution of Weight for Age, Weight for Length and Length for age of NE Exposed and 'Control' Group

Age (months)	No. of Infants		Weight for Age		Weight for Length		Length for Age	
	Pre PE	Post NE	'Control' A	Exposed B	'Control' A	Exposed B	'Control' A	Exposed B
5	1	-	(-) 1.16	(-) 0.08			(-) 1.13	
6	1	-	(-) 1.33	(+) 0.29			(-) 1.88	
7	7	1	(-) 1.77	(-) 0.88 ↑	(-) 0.565	(+) 2.8 ↓	(-) 1.19	(-) 1.33 ↓
8	1	1	(-) 2.0	(-) 1.5 ↑	(-) 0.57	(-) 2.8 ↓	(-) 0.96	(-) 2.07 ↓
9	4	7	(-) 2.54	(-) 1.78 ↑	(-) 0.81	(-) 0.51 ↑	(-) 2.51	(-) 1.95 ↑
10	3	1	(-) 2.56	(-) 1.9 ↑	(-) 1.42	(-) 0.87 ↑	(-) 1.79	(-) 1.53 ↑
11	7	4	(-) 2.98	(-) 2.49 ↑	(-) 1.79	(-) 1.3 ↑	(-) 2.09	(-) 2.4 ↓
12	1	3	(-) 2.85	(-) 2.14 ↑	(-) 2.94	(-) 1.09 ↑	(-) 0.28	(-) 2.0 ↑
13	2	7	(-) 3.65	(-) 2.74 ↑	(-) 2.7	(-) 1.81 ↑	(-) 2.7	(-) 2.0 ↑
14	1*	1	(-) 2.09*	(-) 0.59 ↑	(-) 0.875*	(-) 1.55 ↓	(-) 4.84*	(-) 1.06 ↑
15	2	2	(-) 2.56	(-) 2.79 ↓	(-) 1.75	(-) 2.13 ↓	(-) 1.96	(-) 2.1 ↓
17	1	2	(-) 3.37	(-) 2.26 ↑	(-) 2.35	(-) 1.93 ↑	(-) 2.55	(-) 1.4 ↑
19	1	1	(-) 2.66	(-) 2.83 ↓	(-) 2.11	(-) 2.37 ↓	(-) 1.87	(-) 1.87 ↔
21	1*	1	(-) 2.20*	(-) 2.08 ↑	(-) 0.43*	(-) 1.81 ↑	(-) 3.37*	(-) 1.59 ↓

A= Indicators for similar aged infants pre-NE exposure ('control')

B=Indicators of the NE exposed post-NE

*Those not exposed to the NE at all

↓ - Indicators of Exposed group better than 'Controls'

↓ - Indicators of Exposed group lower than the Controls

↓ - Indicators of the Exposed Group same as 'Controls'

demonstrated it to the rest of the group and motivated two others to prepare the same.

Formative research data on IFP has reported first hand field experiences of certain uncommon but PD behaviours adopted by some families in the community that are close to the emphasis behaviours any NE package would promote. Infants of these families show adequate growth (as revealed from their anthropometric measurements) and suffer less frequent bouts of illness. These children are well nourished in spite of their resource constraints.¹³ Without consciously realizing, these PDs have discovered the path to successful survival for the entire group – that is if their secrets can be analyzed, isolated and then shared with the rest of the group as such that the PDs enable everyone else in the community/village to practise those survival behaviours on their own. This social change agent model will ensure both sustainability and ownership of the –‘need-felt’ NE program. NE programs in Haiti, Vietnam, Indonesia, Honduras, Gambia, Bangladesh, Mozambique and Nepal have used the PD approach and have shown successful results.^{14,15}

Some of the field stories of how 2 PDs motivated and played the role of social change agents in the present study are shared below:

Mrs. Y, mother of a 6-month infant made a thick chapatti, cut the center and cooked it in ‘pulse’. She fed this thick gruel to her infant twice in between meal timings. She mentioned that this keeps the baby’s stomach full and so he cries less. She convinced 4 other mothers to cook and feed the same to their infants.

Mrs. Z, mother of a 6-month infant exclusively breast-fed her child on the advice of her mother in law (MIL). The father took special interest in ensuring that the child gets all appropriate immunizations. MIL initiated ‘khichri’ made of pulse, rice and oil at about six months. The child was bathed daily, clad and mother and grandmother actively and patiently fed the child. This family was motivated to promote the emphasis behaviours they had been practicing to other mothers participating in the NE program. The MIL started promoting the value of desired behaviours her family had been practicing to the rest of the mothers during the FGDs. This led 10 mothers to prepare *Khichri* made of cereal + pulse combination, 1 tsp of ghee (milk fat) and 12 others to increase the frequency of feeding from twice a day to four times a day.

CONCLUSION

Repeated reinforcement using a NE ‘communication mix’ is more likely to be effective to bring about positive behaviour change towards appropriate IFP. While an experience like this on a small sample of thirty does not present a statistically significant evidence of results. However it does help us understand the psychosocial environment that effects behaviour change and the valuable role of community members as social change agents in survival. *More research initiatives using this*

approach on a larger sample would be of outmost value to validate the replicability of this innovation to be tested, refined, re-tested and adapted.

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