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Problem of Infant Feeding Practices: Implications for Immediate Action.

by

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Abstract

A survey on infant feeding practices and its problems was conducted in an attempt to improve child health, particularly during the first two years of age, during which breast feeding should be the infant's main food.

Allthough breast feeding was a generally accepted norm of infant nutrition during the first year of age, the majority of infants were not breast fed after one year of age. It was clearly observed that early stopping of breast feeding, particularly during the first six months of age, not only increased the risk of malnutrition, but also increased the risk of diarrheal diseases, which in turn affected significantly the nutritional status.

Early introduction of supplementary food, particularly around three months of age reduced the risk of malnutrition. Since the practice of breast feeding naturally decreases after six months of age, the improvement of the types and quality of supplementary food is important indeed, to maintain the beneficial effects of breast feeding.

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Introduction

In spite of the fact that this century is known as the era of advanced technology, the world is still facing the elemental problem of malnutrition. A great majority of world's population particularly in the third world is suffering from malnutrition. Many factors account for the development of malnutrition, such as : poverty with poorly available food sources, high birth rates, ignorance, poor environmental sanitation, and a high prevalence of infection. Although many of these factors in Indonesia have been reduced due to the tremendous efforts in national development during the last 15 years, malnutrition in childhood has not been conquered yet, and it is still one of the major child-health problems.

It should be pointed out that malnutrition might start during early or even intrauterine life. Infection and inappropriate breast feeding attitudes are factors which should be taken into consideration in accounting for the development of malnutrition during the first two years of life. It is well known that there is a vicious circle between infection and malnutrition. Recently, the interaction of infection and nutrition has been widely reported, and infection is considered one of the main causes of malnutrition in children. On the other hand, breast milk is supposed to be one of the most important foods during the first two years of life, and its role should not be underestimated.

It is stated that breast milk could provide complete caloric and protein requirements for infants up to 6 months of age (Ebrahim, 1978).

This study was conducted in an attempt to find out infant feeding problems during the first two years of life in relation to infections and nutritional status of children, in order to improve child health. The study was undertaken in Manado.

Manado is the capital of North Sulawesi with a total population of 180.000. It is divided administratively into 3 subdistrict (Kecamatan), namely: North, Central, and South Manado. Each subdistrict consists of villages or so called Desa or Rukun Tetangga.

Methodology

The villages within each subdistrict in which surveys were undertaken, were chosen at random. Mothers from sample villages were asked to come to the villages chief office to be interviewed and to bring their infants to be examined.

The data of every infant was recorded in a simple form, so that it would be easy to understand and to fill out.

1. Data on mothers : age, education, parity, occupation, marriage age, place of delivery and person who conducted delivery.

II. Data on infants : Date of birth, birth weight, type of feeding :
— breast feeding or bottle feeding,
— weaning age,
— reasons for weaning,

— age at which the first supplementary food was given,
— types of the first supplementary food.

Body weight : body weight was determined by a standard scale.

Diarrhea : age at which diarrhea occurred for the first time.

Before the interview the mothers were told that the interviewers were eager to learn about their daily infant feeding practices. This method of simply receiving information rather than instructing, tended to insure more honest responses. In this way the attitude of trying to cover up the truth was eliminated or reduced.

Infants excluded from this study were :

1. those infants whose mothers hesitated or appeared to lack confidence in the interview. These included mothers who were not able to tell the exact age at which the first supplementary food was given; the age at which the infant was weaned; or the age at which diarrhea occurred for the first time.
2. infants who had congenital malformation such as CHD or palatoschisis.

TABLE 1 : *The percentages of breast feeding practices in relation to age group and the duration of breast feeding*

Age group	Breast feeding still practice	Age at which breast feeding was stopped			Total
		6 months	6 — 12 months	12 — 18 months	
0 — 6	84.6% (33)	15.4% (6)	—	—	39
6 — 12	71.7% (86)	17.5% (21)	10.8% (13)	—	120
12 — 18	36.5% (27)	6.8% (5)	20.3% (15)	36.4% (27)	74
18 — 24	29.7% (43)	15.9% (23)	24.1% (35)	30.3% (44)	145
Total	189	55	63	71	378

$X^2 = 111{,}40$ DF : 9
$P < 0.00001$.

3. infants whose date of birth was not known:

Result

Breast feeding is still commonly practiced up to the first 6 months after delivery. Our finding revealed 84.6% of infants fall in this category. After 6 months of delivery the number of infants breast fed declined significantly from 84.6% to 71%, and only around 30% of them continued to be breast fed after one year of age. (Table 1 : $P < 0.0001$).

TABLE 2 : *The reasons given for the early stopping of breast feeding were as follows :*

— infants refused to be breast fed	26.5%	or	50	out of	189	infants
— infants were becoming too old to be breast fed	2.6%	or	5	out of	189	infants
— infants were ill	3.2%	or	6	out of	189	infants
— insufficient breast milk	19 %	or	36	out of	189	infants
— advised by doctors or paramedical personnel	8 %	or	15	out of	189	infants
— mothers were ill	10 %	or	19	out of	189	infants
— pregnancy	5.8%	or	11	out of	189	infants
— mothers were too busy to breast fed	7.4%	or	14	out of	189	infants
— no breast milk secretion	8.5%	or	16	out of	189	infants
— common beliefs in the community to have early stopping of breast feeding	4.2%	or	8	out of	189	infants
— mothers were worried that their own diet will have a harmful effect on their babies	1 %	or	2	out of	189	infants
— broken home	1.6%	or	3	out of	189	infants
— cosmetics	1 %	or	2	out of	189	infants
— others	1 %	or	2	out of	189	infants

TABLE 3 : *The number of infants who were bottle fed during the first 3 months of life in relation to the place of birth*

Place of birth	Number of infants	Bottle fed during the first 3 months.
Home deliveries		
— assisted by traditional birth attendant	153 (40.5%)	8 (5.2%)
— assisted by skilled personnel	35 (9.3%)	1 (2.9%)
Hospital deliveries	137 (36.2%)	22 (16 %)
Maternity clinic	53 (14 %)	10 (18.9%)

TABLE 4 : *Nutritional status in relation to age group*

Age group (months)	Nutritional status				Total
	80%	70 — 80%	60 — 70%	60%	
0 — 6	39	—	—	—	39
6 — 12	76.7% 92	18.3% 22	1.7% 2	3.3% 4	120
12 — 24	58.1% 128	25.6% 56	15% 33	0.9% 2	219
Total	68.5% 259	20.6% 78	9.3% 35	1.6% 6	378

Table 4 shows the relationship between the age of infants and the nutritional status. All infants up to six months of age had normal body weight, and the prevalence of malnutrition increased in direct proportion to the increasing age.

TABLE 5 : *The relationship of the nutritional status of infants 1 - 2 years old to the age at which breast feeding was stopped*

Age at which breast feeding was stopped (months)	Total	Nutritional status			
		80% or more	70 — 80%	60 — 70%	60% or less
0 — 6	28	39% (11)	32% (9)	25% (7)	4% (1)
6 — 12	50	46% (23)	36% (18)	18% (9)	—
more than 12	141	65.9% (98)	19% (27)	10.6% (15)	0.7% (1)
Total	219	60.3% (132)	24.7% (54)	14% (31)	1% (2)

TABLE 6 : *The relationship of the nutritional status of infants under 1 year old to the age at which breast feeding was stopped*

Age at which breast feeding was stopped (months)	Total	Nutritional status			
		80% or more	70 — 80%	60 — 70%	60% or less
0 — 6	24	50% (12)	33.3% (8)	—	16.7% (4)
6 — 12	135	85.2% (115)	11.8% (16)	3% (4)	—
Total	159	79.9% (127)	15.1% (24)	2.5% (4)	2.5% (4)

The percentages of malnutrition in infants who were not breast fed from :

0 — 6 months of age was surprisingly high 50% in infants under 1 year and as much as 61% in infants 1 - 2 years of age.

6 — 12 months of age dropped sharply to 14.8% in infants under 1 year and to 54% in infants 1 - 2 years of age.

Infants 1 - 2 years old group who were still breast fed after 12 months, the percentages of infants suffered from malnutrition declined to 34.1%.

The role of the first supplementary food on infants nutrition can be seen in table 7.

The percentages of malnutrition in infants who were given their first supplementary food at 0 - 3 months was 8.9% in infants under 1 year of age but was 26,8% in 1 - 2 years of age. Among those in the 3 - 6 months the rate of malnutrition nearly doubled to 16.1%, but rose by only 3% to 29.9% in 1 - 2 years of age. For those at the 6 - 9 months the rates of malnutrition nearly trippled to 23.5% in infants under 1 years, and more than doubled to 54.8% in 1 - 2 years of age.

Finally in those 9 months or beyond the rate rose only about 6% to 29.2% in infants under 1 years and increased by 3% to 58% in 1 - 2 years old infants.

Table 8 shows a relationship between the age at which breast feeding was stopped and the incidence of diarrhea.

The rate of diarrheal diseases among those who were not breast fed from 0 - 12 months was higher than anticipated. These figures are represented in the following way :

Infants who were not breast fed since 0 - 6 months of age revealed a 86.2% contraction of diarrheal diseases, while those who were still breast fed at 6 - 12 months only 54% contracted diarrhea. And finally the 1 - 2 years age group showed the same phenomena.

These figures contrast sharply with those infants who continue to be breast fed after 12 months of age, during which

15% of infants experienced diarrhea compared with infants who were not breast fed during the first six months of life.

TABLE 7 : *The incidence of malnutrition in relation to age groups and age at which the supplementary food was given*

Age group	Nutritional status	Age at which the first supplementary food was given				
		0 — 3	3 — 6	6 — 9	more than 9	Total
⩽ 1 year	80% or more	91.1% (41)	83.9% (47)	76.5% (26)	70.8% (17)	131
	70 — 80%	6.7% (3)	14.3% (8)	17.6% (6)	20.8% (5)	522
	60 — 70%	—	—	—	8.3% (2)	2
	60% or less	2.2% (1)	1.8% (1)	5.9%' (2)	—	4
	Total	(45)	(56)	(34)	(24)	159
1 - 2 years	80% or more	73.2% (30)	70.1% (54)	45.2% (33)	42% (11)	128
	70 — 80%	19.5% (8)	16.9% (15)	38.4%	19.2% (5)	56
	60 — 70%	4.9% (2)	11.7% (9)	38.4% (12)	38.5% (10)	33
	60% or less	2.4% (1)	1.3%' (1)	—	—	2
	Total	(41)	(79)	(73)	(26)	219

The relationship between diarrheal diseases and nutritional status can be seen in table 9 & 10. The incidence of malnutrition in infants who never experienced diarrhea was 14.4%. In contrast, those experiencing diarrhea once the rate of malnutrition was 38.3%, and 47% in those experiencing diarrhea twice or more.

The percentages of infants who never had experience of diarrhea decrease from 66.7% at the age of 0 - 6 months to 46% at the age 6 - 12 months and dropped sharply to 13.2% of the age 1 - 2 years.

None of infants 0 - 6 months old who ever had experience of diarrhea suffered from malnutrition. However, it increased to 21.5% in infants 6 - 12 months group, and jumped to 50% in infants 1 - 2 years of age group.

TABLE 8 : *The episodes of diarrhea in relation to breast feeding practices*

Age group	Age at which breast feeding was stopped	Infants who			Total
		Experience diarrhea		Never experiencing diarrhea	
		1x	2x		
0 — 6	0 — 3 months	50% (4)	12.5% (1)	37.5% (3)	8
	breast fed up to more than 3 months	22.6% (7)	3.2% (1)	74.2% (23)	31
6 — 12	0 — 6 months	75.9% (22)	10.3% (3)	13.8% (4)	29
	breast fed up to more than 6 months	39.6% (36)	4.4% (4)	56% (51)	91
12 — 24	0 — 6	78.1% (25)	18.8% (6)	3.1% (1)	32
	6 — 12	73.8% (48)	12.3% (8)	13.9% (9)	65
	12	76% (92)	9% (11)	15% (19)	121

Discussion

Malnutrition in children under 2 years of age is indeed a serious child health problem in Indonesia, since one third suffer from malnutrition. Our survey revealed that 95% were of mild and moderate forms, but only 5% were of severe form of malnutrition. Although malnutrition develops in the earliest sta-

TABLE 9 : *Nutritional status in relation to the episodes of diarrhea*

Episodes	Total	Nutritional status			
		80% or more	70 — 80%	60 — 70%	60% or less
Without diarrhea	132	85.6% (113)	8.3% (11)	5.3% (7)	0.8% (1)
1 ×	180	61.7% (111)	26.7% (48)	10.6% (19)	1% (2)
2 ×	66	53% (35)	28.8% (19)	13.6% (9)	4.6% (3)

$D \times^2 = 32.9$ DF. 6 —— $p < 0.0001$.

TABLE 10 : *The nutritional status of infants with or without experiencing diarrhea according to age group*

Age group (months)	Total	Number of infants experienced diarrhea		Nutritional Status				Level of signifi cancy
				80% or more	70-80%	60-70%	60% or less	
0 - 6	39	experienced	13	100% (13)	—	—	—	—
		never	26	100% (26)	—	—	—	
6 - 12	120	experienced	65 (54%)	78.5% (51)	12.3% (8)	6.2% (4)	3% (2)	$p < 0.05$
		never	55 (46%)	90.9% (50)	5.5% (3)	1.8% (1)	1.8% (1)	
12 - 24	219	experienced	190 (86.8%)	50% (95)	33.7% (64)	14.7% (28)	1.6% (3)	$p < 0.05$
		never	29 (13.2%)	72.6% (24)	15.7% (3)	11.7% (2)	—	

ges of growth, the period after 6 months is considered to be the most critical age; for there, malnutrition becomes manifest. 20% of infants between 6 - 12 months were in mild and moderate forms of malnutrition, and the rate double after the age of one year. Many factors account for the manifestation of malnutrition after 6 months of age, such as : breast feeding practices significantly decreased and the episodes of diarrhea increased it. On the other hand, all infant under 6 months were well nourished. This might be related to the high prevalence of breast feeding practices, the low incidence of diarrheal diseases during that period, and the custom of early introduction of supplementary food.

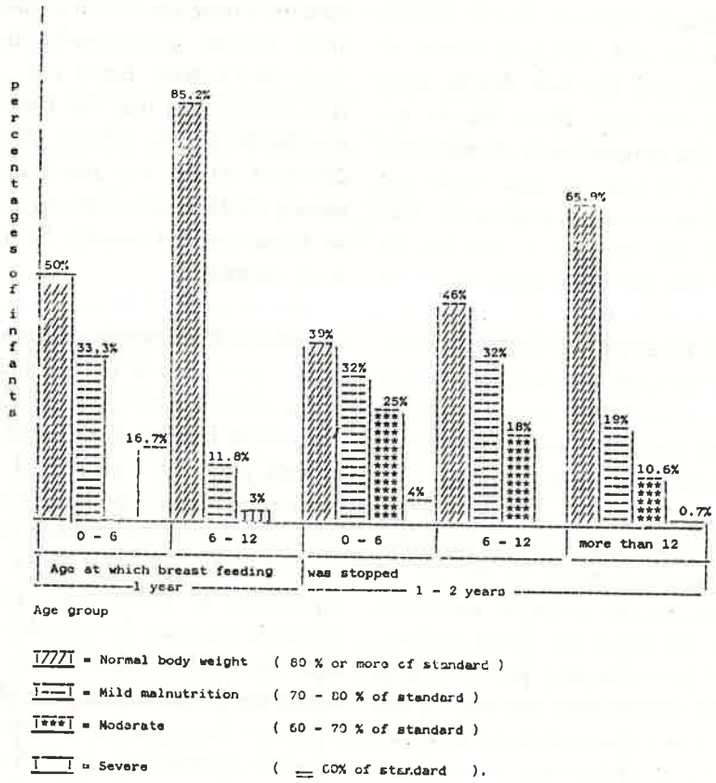
In spite of the fact that breast feeding is still commonly practiced, its prevalence is significantly related to the age of infants and to the place of deliveries. The older the infant the lower the prevalence of breast feeding practices: One third of the infants after one year of age were still breast fed, compared with two third of infants under one year of age.

The role of the environment in determining successful lactation and nursing, particularly during the early life of the newborns was clearly observed in this survey. The separated care of mothers and newborns in the hospital will have a negative influence on mother's attitudes toward breast feeding. On the other hand home deliveries provide a rooming-in care started at birth which creates a strong bonding between mothers and newborns, which contributes to better nursing practices. Among home deliveries consisted 49.7% of all deliveries, only 4.8% were fed by bottle feeding during the first 3 months of age, while among institutionally borned infants 16.8% were bottle fed. Therefore it is clearly seen that the trend to practice bottle feeding among institutionally delivered infants was much higher than among those infants who were delivered at home assisted mainly by traditional birth attendants.

The duration of breast feeding practices effects significantly the infants nutritional status (figure 1). The incidence of malnutrition decreased in direct proportion to the lengthened duration of breast feeding practices. The risk of malnutrition in infants was the highest when they were not breast fed within the first 6 months of life (Table 4 & 5). It is also interesting to point out that Parkin (1976) in his study in East Africa, found that the children there, who were not breast fed in the second year of life were likely to have 20 - 30% deficiency in calories, eventhough their food intake was increased by 60% compared with the children who were still breast fed who showed no calorie deficiency.

Concerning supplementary food, the quality and the ages at which it was introduced are also noted. The types of supplementary food currently used is inappropriate for infants' growth, since the vast majority received bananas and salted-rice-porridge. Improper use of supplementary food was not mainly due to the lack of food stuffs, but it was con-

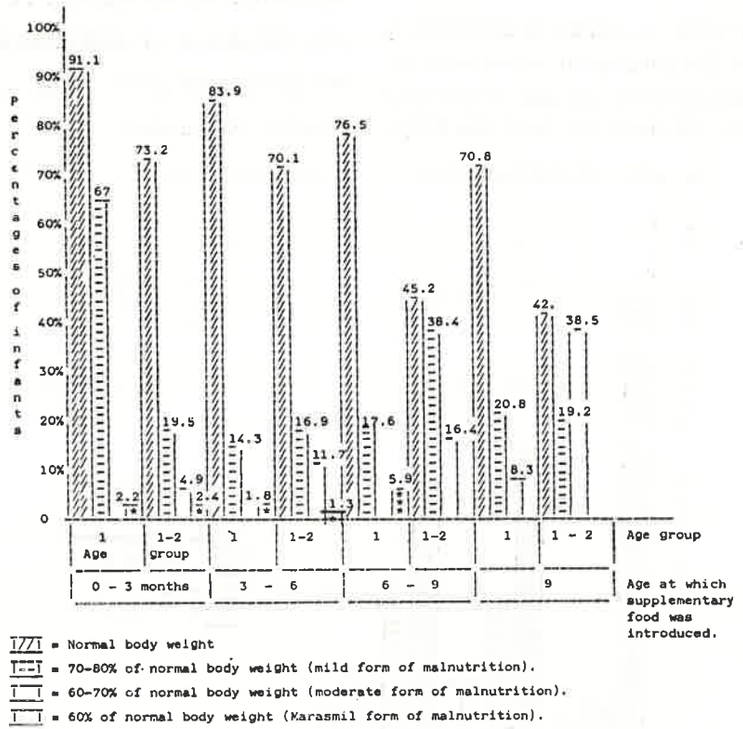
FIG. 1 : *The incidence of malnutrition in relation to the age at which breast feeding was stopped*



cerned with the ignorance of the quality and the importance of supplementary food for infants' growth.

The age at which supplementary food is introduced significantly effects the nutritional status (figure 2). The longer the delay in introducing the first supplementary food, the higher the incidence of malnutrition. The incidence of malnutrition was the highest among infants whose supplementary food was begun after 9 months of age. In spite of poor quality of supplementary food, the long beneficial impacts of early institution can be clearly observed, particularly in infants of 1 - 2 years of age. In this group, the incidence of malnutrition increased. Among these, the incidence of malnutrition increased from 26,8% (these received supplementary food during the first three months)

FIG. 2 : *Nutritional status in relation to age at which supplementary food was introduced*



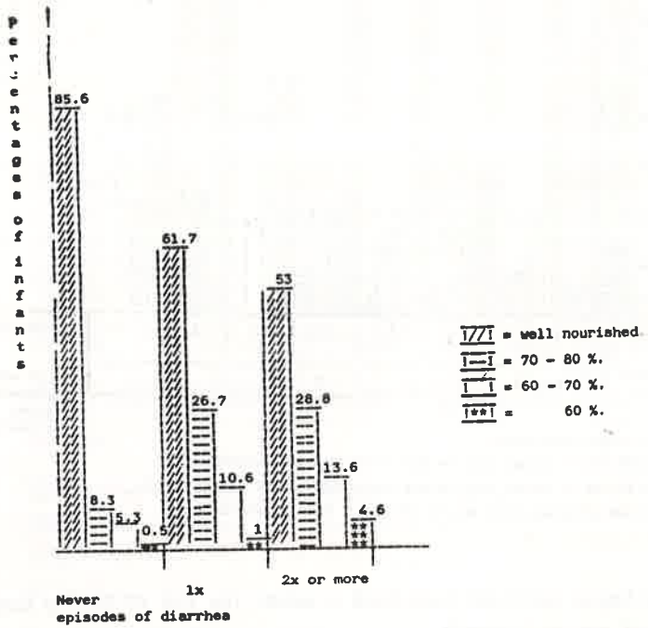
to 58% (these began supplementary food at 9 months of age or beyond).

Early stopping of breast feeding also effected the prevalence and the episodes of diarrhea. The prevalence and the episodes of diarrhea were the highest among infants who were not breast fed during the first six months of age. This clearly observed among 6 - 12 months age group (table 8). On the other hand the number of infants experiencing diarrhea increased sharply from 25% in 0 - 6 months to 86.8% in 1 - 2 year old infants. However, the risk of having frequent diarrhea was doubled when breast feeding was stopped at the age of 0 - 6 months than when it was stopped after one year (table 8). The high risk of experiencing diarrhea among infants who were not breast fed during the early stages of life may be due to the high risk of infection among bottle fed infants, since bottle milk lacks protective factors (Goldman & Smith 1973, and Hansen et al. 1977) and has a high risk of bacterial

contamination (Soderhjeem, 1972; Surjono et al, 1980).

Diarrhea has a significant deteriorating effect on the nutritional status was clearly observed after the age of one year (table 10). On the other hand, the frequency and the severity of malnutrition is determined by the episodes of diarrhea. The prevalence of malnutrition can be decreased significantly by decreasing the episodes of diarrhea.

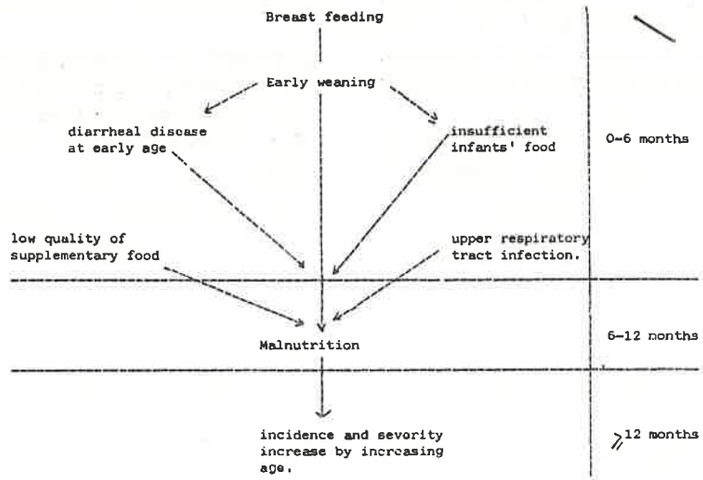
FIG. 3 : *The effect of diarrheal episodes on nutritional status*



The risk of infants suffering from diarrheal diseases increases when breast feeding is stopped at an early age, and that risk is closely related to the infants age. In infants 1 - 2 years of age who were not breast fed from 0 - 6 months of age 96.4% experienced diarrhea compared with 81.6% who were breast fed for longer than 12 months of age..

The foregoing discussion clearly implies that the role of breast feeding as the primary nutritional source from birth to six months of age is decisive indeed in infants' growth, considering that all infants up to 6 months were well nourished. As such, since the role of breast feeding naturally decreases after 6 months of age the improvement of the types and the quality of supplementary food is important to maintain the benificial effects of breast feeding after 6 months of age.

FIG. 4 : *The pathogenesis of malnutrition during infancy*



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