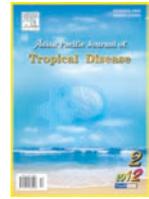


Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Asian Pacific Journal of Tropical Disease

journal homepage: [www.elsevier.com/locate/apjtd](http://www.elsevier.com/locate/apjtd)

Document heading

doi:

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# Mothers literacy status and its association with feeding practices and PEM among 1–5 year aged children in southern part of India, Mysore

Santosh Kumar A<sup>1\*</sup>, Raghavendraswamy Koppad<sup>1</sup>, NC Ashok<sup>2</sup>, Madhu B<sup>2</sup>, Sunil kumar D<sup>2</sup>, Muruli Dhar<sup>3</sup>, Chandrashekar SV<sup>1</sup>

<sup>1</sup>Department of Community medicine Shimoga Institute of Medical Sciences, Shimoga, India

<sup>2</sup>Department of Community Medicine JSS Medical College, Mysore, India

<sup>3</sup>Department of Statistics, Manipal University, Manipal, India

## ARTICLE INFO

### Article history:

Received 14 August 2012

Received in revised form 30 August 2012

Accepted 3 December 2012

Available online 28 December 2012

### Keywords:

PEM

Literacy

Feeding practices

## ABSTRACT

**Objective:** To estimate the prevalence of PEM in children aged 1 to 5 years and to study the association of mothers educational status with feeding practices and nutritional status of children aged 1 to 5 years. **Methods:** A cross sectional study of 600 children of 1–5 year age group in urban slums of Mysore city was carried out with cluster random sampling method. The data was collected by using a predesigned and pretested proforma. Assessment of the nutritional status was done by clinical examination and anthropometry. WHO child growth standards, 2006 reference data were used to classify malnutrition. **Results:** Among 600 children examined, 285 (47.5%) were males and 315 (52.5%) were females. Exclusive breast feeding was given in 295 (49.2%) of children. Pre lacteal feeds and top milk feeds were given in 123 (20.5%) and 108 (18%) of children respectively. The prevalence of underweight, stunting and wasting was observed to be 31.3%, 42.2% and 14.2% respectively. About 12.8% of mothers were illiterate and this was significantly associated with feeding practices and nutritional status of children. **Conclusions:** Mothers literacy status plays important role in feeding practices of their children which in turn is an important factor in determining the nutritional status of child.

## 1. Introduction

Children are nature's gift and the fountain of life. They are our future and are supremely important asset of nation. The term 'nutrition' is derived from a Latin word *nutritic*, meaning nourishment[1]. Mal means any deviation from normal phenomenon. Malnutrition is defined as any deviation from normal nutrition. Globally, each year malnutrition is implicated in about 40% of the 11 million deaths of under five children in developing countries and lack of exclusive breast feeding in infancy causes an additional 1.5 million deaths[2]. Despite the spectacular increase in the food grain production in recent years,

the problem of chronic malnutrition continues to exist extensively, especially among children of below 6 years of age as they are caught in a relentless sequence of ignorance, poverty, inadequate food intake, disease and early death. Undernutrition is still the major problem in our country especially in underserved areas such as urban slums. There are some unique problems faced by the people in urban slums. High prices of food, health care goods and essential commodities are making them unaffordable. They are denied the right to housing, their infrastructure is neglected and they are not provided easy access to basic healthcare; Scarcity of water supply and overcrowding reduce the quantity available per head[1]. Therefore this study was planned to know the role of various factors and specifically maternal literacy status and their feeding practices influencing the nutritional status and was purposefully carried out in urban slums, which are regarded

\*Corresponding author: Dr. Santosh Kumar A, Assistant Professor, Department of Community Medicine Shimoga Institute of Medical Sciences Shimoga – 577 201.

Tel.: 09916966833

E-mail: santu\_ar2003@yahoo.co.in

as the most problematic area in relation to under nutrition and associated morbidity.

## 2. Material and methods

### 2.1. Subjects and methods

This cross sectional study was undertaken in urban slums of Mysore city, Karnataka for a period of one year.

### 2.2. Study area

The present study was taken up in urban slums of Mysore city. The slum clearance board of Mysore city was approached to get the list of slums and the population residing in each slum. A total of 62 slums have been listed with a total population of 47931.

### 2.3. Study population

Urban slum children aged 1 to 5 years.

### 2.4. Inclusion criteria

All children between 1–5 years old age groups staying in the selected slums for a minimum period of 6 months.

### 2.5. Exclusion criteria

Children, whose parents or guardians did not consent for the study. Children who are temporary visitors to the house and children who were severely ill.

### 2.6. Sample size

For estimation of sample size, prevalence of PEM was taken as 40%, as per NFHS 3 report<sup>[3]</sup>, with allowable error of 10% (using the formula  $n=4pq/L^2$ ) and the required sample was estimated to be 600 children.

### 2.7. Sampling method

Sampling frame was the list of all urban slums. A list of slums along with their population was obtained from slum clearance board of Mysore city. A total of 62 slums were

listed with a total population of 47931. With this data average population per slum comes to 773. Assuming proportion of children in 1–5 years old age group as 8% of population<sup>[4]</sup>, it was calculated to be around 62 children of 1–5 years old age group per slum. Each slum was considered as a cluster and the same was taken as sampling unit. To arrive at a sample of 600 among 62 slums, 10 slums were selected at random (*i.e.* Cluster random sampling method)<sup>[5]</sup>. All children in selected slums were included and all children between 1–5 years old age group was enumerated and examined for protein energy malnutrition.

### 2.8. Methodology

A semi-structured questionnaire was designed and pilot tested. The information regarding parent's education, occupation, religion, per-capita income and infant feeding practices was collected. General physical examination including recording of anthropometrics was done. Body weight was measured without any footwear and with minimal clothing nearest to 0.5 kg using a standard portable weighing machine. For children between 1–2 years old, the supine length was measured using an infantometer and for children between 2 to 5 years old, standing height was measured without any foot wear to nearest 0.5 cm using a standard calibrated bar.

### 2.9. Statistical analysis

The data was analyzed using Epi Info 2002 version 04. The height and weight of each child was compared with the WHO child growth standards, 2006 reference data for that particular age and sex to get weight for age, height for age and weight for height indices. Children below two standard deviation of the reference median on any of these indices were considered as undernourished and termed as underweight, stunted and wasted respectively. Children below three standard deviation were considered to be severely undernourished<sup>[6]</sup>. Prevalence of protein energy malnutrition was worked out along with 95% confidence interval. Chi square test was applied to find out the association of PEM with the above factors at 5% level of significance.

## 3. Results

**Table 1**

Distribution of study subjects according to age and sex.

Age (In months)	Males		Females		Total	
	No.	%	No.	%	No.	%
12–23	50	46.3	58	53.7	108	18.0
24–35	109	51.9	101	48.1	210	35.0
36–47	69	42.6	93	57.4	162	27.0
48–59	57	47.5	63	52.5	120	20.0
Total	285	47.5	315	52.5	600	100.0

A total of 600 children were studied from the 10 selected urban slums which consisted of 285 (47.5%) males and 315 (52.5%) females.

With regards to age distribution in Table 1, it was observed that maximum number of children were 210 (35%) in the age group of 24–35 months, and least number of children were 108 (18%) in the age group of 12–23 months old.

Table 2 showed the distribution of study subjects according to their mothers literacy status. About 77 (12.8%) mothers were illiterate and only 123 (20.5%) of them had literacy level high school and above.

**Table 2**  
Distribution of study subjects according to their mothers educational status.

LiteracyStatus	Mother	
	No.	%
Illiterate	77	12.8
Primary	203	33.8
Middle	197	32.8
High school	110	18.3
Intermediate/Diploma	13	2.2
Graduate	0	0.0
Total	600	100.0

**Table 4**  
Nutritional status of study subjects according to sex.

Sex	Normal		Underweight		Stunting		Wasting	
	No.	%	No.	%	No.	%	No.	%
Males	198	69.5	87	30.5	120	42.1	43	15.1
Females	214	67.9	101	32.1	133	42.2	42	13.3
Total	412	68.7	188	31.3	253	42.2	85	14.2

$P > 0.05$

**Table 5**  
Feeding practices with respect to mothers literacy status.

Feeding practices		Mothers literacy status		
		Illiterate No (%)	Primary to high school No (%)	High school and above No (%)
Prelacteal feeds*	Given	19 (24.7)	56 (27.6)	48 (15)
	Not given	58 (75.3)	147 (72.4)	272 (85.0)
Exclusive breast feeding*	Given	26 (33.8)	106 (52.2)	163 (50.9)
	Not given	51 (66.2)	97 (47.8)	157 (49.1)
Top milk feeds*	Given	27 (35.1)	39 (19.2)	42 (13.1)
	Not given	50 (64.9)	164 (80.8)	278 (86.9)
Age at weaning*	Less than 6 months	51 (66.2)	90 (44.3)	114 (35.6)
	At 6 months	10 (13.0)	81 (39.9)	121 (37.8)
	More than 6 months	16 (20.8)	32 (15.8)	85 (26.6)

\* $P < 0.05$ .

**Table 6**  
Nutritional status of children with respect to feeding practices.

Feeding practices	Number (%)	Underweight No. (%)	Stunting No. (%)	Wasting No. (%)
Exclusive breast feeding**	Given	295 (49.2)	53 (18.0)	109 (36.9)
	Not given	305 (50.8)	135 (44.3)	144 (47.2)
Top milk feeds**	Given	108 (18.0)	70 (64.8)	65 (60.2)
	Not given	492 (82.0)	118 (24.0)	188 (38.2)
Prelacteal feeds**	Given	123 (20.5)	59 (48.0)	67 (54.5)
	Not given	477 (79.5)	129 (27.0)	186 (39.0)

\*\* $P < 0.05$ .

With respect to feeding practices, it was observed that maximum children 477 (79.5%) were not given any pre-lacteal feeds and were directly started on breast-feeding (Figure 1). With regards to top milk feeding it was noted that only 108 (18%) of the children were given top milk. Exclusive breast-feeding up to six months of age was practiced in 305 (50.8%) children but was not practiced in 295 (49.2%) of children (Figure 2).

Table 3 showed, according to the WHO recommended classification the prevalence of underweight (low weight for age), stunting (low height for age) and wasting (low weight for height) to be 129 (21.5%), 135 (22.5%) and 9 (7.5%) respectively. Severe degree of underweight, stunting and wasting observed were 9.8%, 19.7% and 5.8% respectively.

**Table 3**  
Distribution of nutritional status of study subjects according to WHO classification.

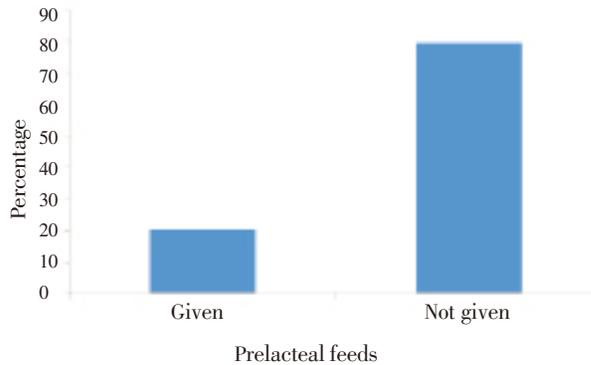
Indices	Normal		Undernourished		Severely undernourished	
	No.	%	No.	%	No.	%
Weight for age	412	68.7	129	21.5	59	9.8
Height for age	347	57.8	135	22.5	118	19.7
Weight for Height	515	86.7	61	10.2	24	4.0

Table 4 showed sex-wise distribution of malnutrition underweight, stunting and wasting were present in 87 (30.5%),

**Table 7**

Nutritional status of children according to initiation of weaning.

Weaning practices	Number (%)	Underweight No. (%)	Stunting No. (%)	Wasting No. (%)
Age at weaning <6 months	255 (42.5)	128 (50.2)	123 (48.2)	49 (19.2)
at 6 months*	212 (35.3)	27 (12.7)	64 (30.2)	21 (9.9)
>6 months	133 (22.2)	33 (24.8)	66 (49.6)	15 (11.8)

\* $P<0.05$ .**Figure 1.** Distribution of study subjects according to pre-lacteal feeds.

120 (42.1%) and 43 (15.1%) of males respectively, whereas in females it was 101 (32.1%), 133 (42.2%) and 42 (13.3%) respectively. Although the prevalence of underweight was higher in female children, the difference was not statistically significant ( $P>0.05$ ).

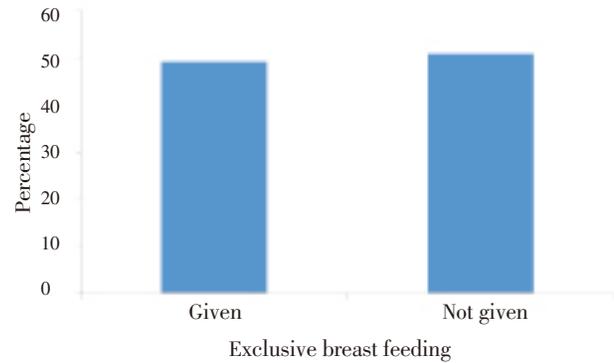
Table 5 revealed as mothers literacy status improved their feeding practices also improved and it was significantly associated ( $P<0.05$ ). Mothers who had high school and above literacy level, 272 (85%) of them did not give pre-lacteal feeds, 278 (86.9%) did not give top milk feeds and about 163 (50%) gave exclusive breast feeding.

Table 6 reflected the prevalence of underweight, stunting and wasting to be high among children who were not exclusively breast fed and among children who were given top milk feeds and it was significantly associated ( $P<0.05$ ). Children who were given pre-lacteal feeds were also having significantly high prevalence of underweight, stunting and wasting.

Table 7 depicted the weaning practices and which was started at the right time (at six months) in 212 (42.5%) children, started early (<6 months) in 42.5% children while in rest it was delayed beyond 6 months. Prevalence of undernutrition, stunting and wasting were high among children who were not given proper weaning and it was significantly associated ( $P<0.05$ ).

#### 4. Discussion

It was found out that out of 600 children, about 31.3% were underweight, 42.2% were stunted and 14.2% of children were having wasting. In a study conducted in three urban slum of Tripuri town, it was observed that prevalence of underweight was 38.38%, prevalence of stunting was 46.06%, both kinds of malnutrition were common in females than in males[7].

**Figure 2.** Distribution of study subjects according to exclusive breast feeding.

A study conducted in urban areas of Allahabad, among the four anganawadi areas selected 36.4% had underweight, 51.6% had stunting and 10.6% had wasting, improper weaning practices was found to be significant risk factor for underweight, which is similar to our study[8].

In our study maternal literacy status and their feeding practices was significantly associated. Not much study has been done with these two variables. In this study it was observed that all types of malnutrition were high in children who were not exclusively breast fed. Similar findings were reported by Bloss *et al*[9], that the lack of giving exclusive breast feeding up to 6 months was associated significantly with underweight (OR=2.28, 95% CI=1.3–4.61).

A cross sectional study conducted in the field practice area of Urban health centre, Chetla, which is an integral part of All India Institute of Hygiene and Public Health, Kolkata, exclusive breast feeding was less in literate mothers, however the finding was based on a sample[10]. A study by Rasanias *et al*[11] in Maternal and Child Health Center, Mehrauli, Delhi showed that the duration of breast feeding was significantly associated with malnutrition ( $P<0.05$ ). In the present study, prevalence of underweight, stunting and wasting were found to be higher in children who were not weaned properly. Similar to present study findings, Rasanias *et al*[11] reported that weaning was started at optimum age of 4–6 months in 42.9% children, started early (<4 months) in 24.5% children while in rest it was delayed beyond six months. Severe malnutrition was significantly higher ( $P<0.05$ ) in children where weaning was delayed. Undernutrition is still the major problem in our country especially in underserved areas such as urban slums. The migration of people from rural to urban areas has compounded the housing problem in the latter and these people settle in shanty towns and slums in the fringes of the cities. Not getting the basic human necessities adversely affect the growth and nutritional status of this

weaker section of society. Most slum dwellers in India belong to category of 'permanent necessitarians' who are forced to live in the existing eco cultural slum situations on account of poverty and social discard. Being most vulnerable segment of the community the preschoolers are at greatest risk of malnutrition since it is their growing period which demands high intake of proteins and calories. Maternal literacy status has a huge impact on their feeding practices which in turn is directly related to nutritional status of children, which reminds us that female literacy and empowerment is the need of the hour. Infant feeding practices have to be addressed rightly to see that the appropriate practices are followed.

### Conflict of interest statement

We declare that we have no conflict of interest.

### Acknowledgements

I am very thankful to, Urban slum children of Mysore city for their cooperation during the study.

All faculty members of Department of Community Medicine, JSS Medical College, Mysore.

Ethical Clearance: obtained from institutional ethical clearance committee of JSS Medical college, Mysore.

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