

# A STUDY TO ASSESS THE PREVALENCE OF MALNUTRITION AMONG UNDER-FIVE CHILDREN IN ALAMADHI VILLAGE, CHENNAI

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## Abstract

**BACKGROUND :** Malnutrition is defined as a pathological state resulting from absolute or relative deficiency or excess of one or more of the nutrients that are considered essential for normal life. Primary malnutrition is due to lack of primary health care and other social or environmental factors, and secondary malnutrition is due to the presence of some basic pathological conditions. Malnutrition is considered to be one of the foremost causes of morbidity and mortality in children less than five years of age throughout the world. Malnutrition may range from mild to severe and life-threatening.

**OBJECTIVES :** 1. To determine the prevalence of malnutrition among children aged 0-60 months in Alamadhi village.

2. To identify the associated factors of malnutrition among children aged 0-60 months in Alamadhi village.

**METHODS :** Descriptive Cross-sectional study was conducted from July 2018 to September 2018 in Alamadhi village among randomly selected 200 children aged 0-60 months. After obtaining informed consent data pertaining to Socio-demographic details, child caring practices, utilization of services were collected through face-to-face interview from the mother of the child through validated semi-structured questionnaire. Anthropometric measurements were made following standard procedure for children. Data were entered in excel and analysed using SPSS Version 16.

**RESULTS :** The overall prevalence of underweight, stunting and wasting were 36.5%, 27.5%, 36.4% respectively. 52% of the study participants were females. The nutritional status of the children were significantly associated with family size, literacy status of the mother, socio-economic status, breast feeding practices and household hygiene practices.

**CONCLUSION :** The study revealed that the prevalence of malnutrition was relatively high in alamadhi village. Particular emphasis on early initiation of breastfeeding, small family norms and household hygiene practices need to be enhanced to improve the nutritional status of young children.

## INTRODUCTION

Malnutrition is defined as a pathological state resulting from absolute or relative deficiency or excess of one or more of the nutrients that are considered essential for normal life. Primary malnutrition is due to lack of primary health care and other social or environmental factors, and secondary malnutrition is due to the presence of some basic pathological conditions. Malnutrition is considered to be one of the foremost causes of morbidity and mortality in children less than five years of age throughout the world. Malnutrition may range from mild to severe and life-threatening.<sup>1,2</sup>

Globally, over 10 million children under the age of 5 years die every year from preventable and treatable illnesses despite effective health interventions. At least half of child death are due to malnutrition. Malnourished children have lower resistance to infection; therefore, they are more likely to die from common childhood illnesses such as diarrhoeal diseases and respiratory infections. In addition, malnourished that survive are likely to suffer frequent illnesses, which severely affects their nutritional status and locks them into a vicious cycle of recurring sickness, faltering growth and diminished learning ability in developing countries. Malnutrition is a major health problem.<sup>1,2</sup>

The burden of malnutrition is more in South East Asia than compared to Africa and to rest of the world. The prevalence

of underweight & stunting in South-East Asia had been recorded as 44% and 46% respectively.<sup>3</sup>

It has been found that non-exclusive breast feeding in the first six months of life results in 1.4 million deaths and 10% of the disease burden among infants and young children every year in the developing countries.<sup>3</sup>

About 21% of global deaths and DALYs in children younger than 5 years are attributed to stunting, severe wasting and intrauterine growth retardation.

A well-nourished child is one with access to adequate food supply, care and health. Such a child will have weight and height measurements that compare very well with the standard normal distribution of heights (H) and weights (W) of healthy children of the same age and sex. Thus, the best way to evaluate the nutritional status and overall health of a child is to compare the child's growth indices with the set cut-off points in the standard normal distribution of well nourished children that are associated with adequate growth. Factors that contribute to malnutrition are many



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and varied. The primary determinants of malnutrition, as conceptualized by several authors relate to unsatisfactory food intake, severe and repeated infections, or a combination of the two. The interactions of these conditions with the nutritional status and overall health of the child and by extension - of the populations in which the child is raised have been shown in the UNICEF Conceptual framework of child survival. Briefly, the model characterizes the correlates of malnutrition as factors that impair access to food, maternal and child care, and health care. It is these very factors that impact the growth of children.<sup>1,2</sup>

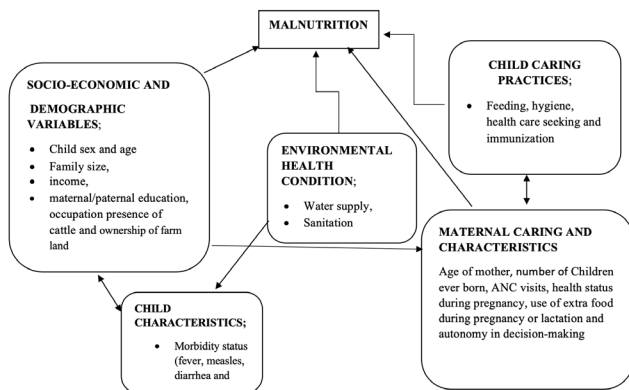


Figure 1 : Conceptual frame work of malnutrition

In India 21 %of children under five years of age suffer from wasting due to acute under nutrition. More than one third of the world's children who are wasted, live in India. 35.7% of Indian children under five years of age are underweight and 38.4 per cent (i.e. 61 million children) are stunted due to chronic under nutrition. India accounts for about 3 out of every 10 stunted children in the world. Under nutrition is substantially higher in rural than in urban areas.<sup>4</sup>

Malnutrition is one of the main health problems faced by children in under five age group in developing countries. The prevalence of malnutrition imposes significant costs on the Indian economy as well. The high mortality due to malnutrition leads to loss of economic potential of the child. It affects the child in many ways, predisposing them to many infectious diseases, psychosocial maldevelopment and cognitive deficiencies.

The prevalence of malnutrition in India is relatively well documented, but not specific to the regions, localities and residence. Here in this study we particularly concentrated more on a rural area in a relatively backward district of Tamil Nadu.<sup>5</sup>

Therefore this study was designed to assess the prevalence of malnutrition among children from age 0-60 months and to determine the factors contributing to malnutrition

particular to that village.

## OBJECTIVE

1.To determine the prevalence of malnutrition among children aged 0-60 months in Alamadhi village.

2. To identify associated factors of malnutrition among children aged 0-60 months in Alamadhi village

## METHODOLOGY

**STUDY DESIGN :** A Descriptive Cross Sectional Study.

**STUDY DURATION :** 3 months (July 2018 - September 2018)

**STUDY POPULATION :** Children aged 0-60 months residing in Alamathi village

**STUDY AREA :** Alamadhi is a village located some 23.8 km away from the Tamil Nadu state capital Chennai. Alamadhi belongs to the Sholavaram administrative block of Tiruvallur district.

**SAMPLE SIZE :** We calculated the sample size using NFHS-4 data of Tiruvallur district where the prevalence of malnutrition was 12.9%

Sample size (n) =  $4pq/d^2$

Where p = 12.9, q = 87.1, d = 5

Sample size (n) =  $4(12.9)(87.1)/(5)(5) = 180$ .

In our study 200 children were selected with non-responsive of 10%.

**SAMPLING TECHNIQUE :** Simple Random Sampling – After obtaining list of Under-five Children from Anganwadi Centre, 200 children were selected randomly by generating random number.

### INCLUSION CRITERIA :

1. Both Male and Female children aged 0-60 months residing at Alamathi village

### EXCLUSION CRITERIA :

1.Children with Congenital defects  
2.Households who were not available on two consecutive visits.

## METHOD OF DATA COLLECTION

A total of 200 randomly selected children were covered for nutritional assessment from 150 households in Alamadhi village. After explaining the purpose of the study, informed and written consent was obtained from all the mothers of the children who were selected for the study. The mother and child were treated as one unit in the study. The validated Semi-structured questionnaire was used to interview mother regarding Socio-demographic factors, infant and young child feeding practices, household hygiene and sanitation, coverage for immunization and ICDS utilisation. Anthropometric

measurement were collected following standard procedure.

### DATA ANALYSIS

Data was entered in MS EXCEL and analysed using Statistical Package for Social Sciences software ( SPSS) Version 16.Descriptive statistics (mean, median, mode) were used to describe continuous variable, while proportion were used for categorical variable.

### OPERATIONAL DEFINITIONS

**Malnutrition :** The term “Malnutrition” generally refers to both undernutrition and overnutrition, but in this study, the term is used in its traditional sense i.e “Undernutrition”

**Undernutrition :** Undernutrition includes Wasting, Stunting and Underweight and is defined as weight for age (underweight), Weight for Height (Wasting), Height for age (Stunting) less than 2 z scores below the median of the WHO child growth standards.

**Wasting :** The Child is said to be wasted if the weight of the child is lower when compared to the weight of a healthy child of the same Height and Sex (Weight for Height)

**Stunting :** The Child’s Height is lower than what is expected of a healthy child of the same age and sex. (Height for Age)

**Underweight :** The Child’s Weight is lower than what is expected of a healthy child of the same age and sex. (Weight for Age)

**Fully Immunized :** A Child who had received all due vaccines as per National Immunization Schedule up to date.

**Partially Immunized :** A Child who had missed any of the vaccines given under the national immunization programme.

### RESULTS

#### 1. SOCIODEMOGRAPHIC PROFILE

A total of 200 children were assessed for malnutrition and the Socio-demographic characteristics were presented in (Table 1).

Among 200 children participated in the study 96 (48%) were male and 104 (52%) were females and 50% of them belonged to age group of 12-36 months. Nearly 47.5% of mothers of Under-5 children had done schooling up to 6-10th. 86.5% of the mothers were housewives and remaining 13.5% were engaged in other labour. About 62% of the households had family size less than ( $\leq$ ) 4 persons, 37% of the study family belonged to middle class (Table 1).

Table 1: Frequency of Sociodemographic Characteristics

VARIABLE		FREQUENCY (%)
Age Distribution	<12 months	25(12.5)
	12 to 36 months	99(49.5)
	>36 to <60 months	76(38)
Gender of the children	Male	96(48)
	Female	104(52)
Family Size	$\leq$ 4 members	124(62)
	5-9 members	72(36)
	$\geq$ 10 members	4(2)
Literacy Status of the Mother	Graduate	32(16)
	Higher Secondary	41(20.5)
	High School	95(47.5)
	Primary Education	18(9)
Socio-economic Class (BG Prasad Scale)	Upper	17(8.5)
	Upper Middle	35(17.5)
	Lower Middle	74(37)
	Upper Lower	55(27.5)
	Lower	19(9.5)

#### 2. CHILD FEEDING PRACTICES

Among 200 children, 98% of them received breastfeeding from mother and the remaining 2% were not breastfed. The chief cause behind not breastfeeding the child was lactation failure.

59% of the infants received breast feeding within one hour delivery, 14.5% within 1-3hrs, 12.0% within 4-11hrs, 2% within 24 hrs and 10.5% after 1 day as shown in figure 2.

Only 20.5% of the mothers gave prelacteal food to their children. The most common prelacteal feed given was sugar syrup (33%).

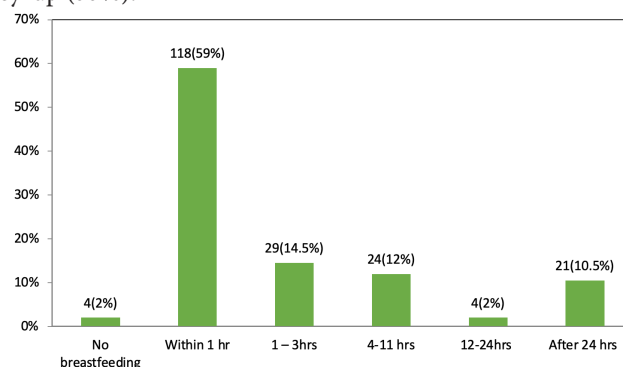


Figure 2 : Frequency of Duration Between Delivery And Breast Feeding Initiation

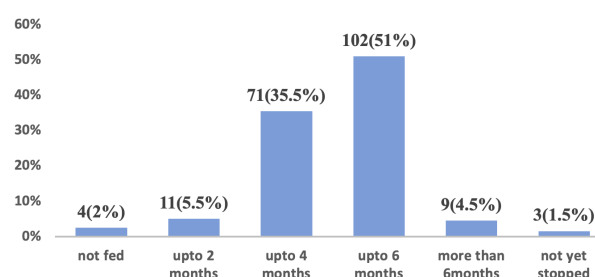


Figure 3 : Frequency of Duration of Exclusive Breast Feeding

Majority of the mothers (51% ) of the children exclusively breastfed their children for the first 6 months. 35.5% of them up to first four months, 5% up to 2 months and 6% of them more than 6 months as shown in Figure 3.

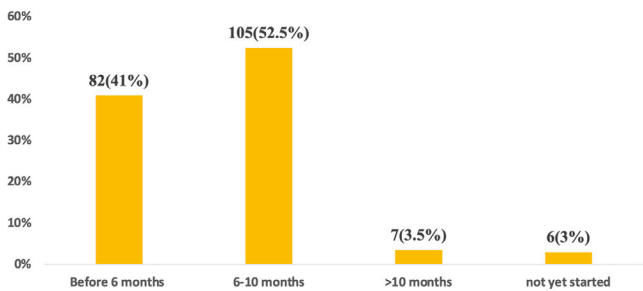


Figure 4 : Frequency of Initiation of Weaning

52.2% of the mothers in our study introduced complementary feeding in 6 to 8 months and nearly 41% before 6th month and stated that it was due to reduced milk secretion as shown in figure 4.

### 3. IMMUNIZATION STATUS OF THE CHILDREN

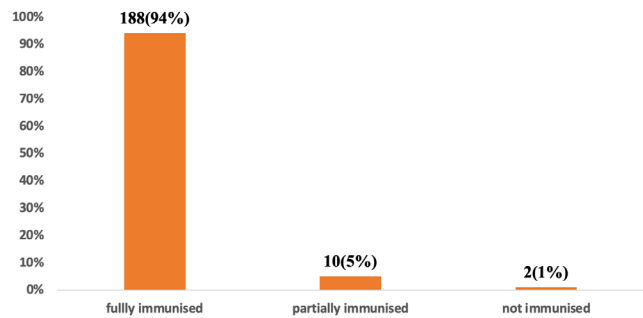


Figure 5 : Frequency of Immunization Status of the Children

The particulars of coverage of children for immunisation under UIP during the first year of life was shown in figure 5 where 94% of the children were fully immunised, 5% were partially immunised and 1% of them were not immunised.

### 4. SANITATION AND HYGIENE

In our study population, the major source of drinking water was public tap (81%), and 66.5% of the children drank the water without any prior treatment, 29.5% of them drank boiled water and 4% after filtration. 58% didn't had separate toilet in their home and utilized public toilet facility. Nearly 62% child had practice of open air defecation. 99% of the mother used to wash hands after using toilet while only around 30% used to wash hands before using toilet and before cooking and only 50% had a practice of washing hands before feeding as shown in (Table 2).

### 5. INTEGRATED CHILD DEVELOPMENT SERVICE UTILIZATION

The ICDS service utilization in our study population was

85%.The reason behind not utilising ICDS services were distant from home, not aware about service and not willing to utilize the service.

Table 2 : Frequency of Sanitation & Hygiene Practice

VARIABLE		FREQUENCY (%)	
Source of Drinking Water	Pipe water	9(4.5)	
	Public Tap	162(81)	
	Protected Well	4(2)	
	Pond	1(0.5)	
	Can Water	24(12)	
Toilet Facility	Public	116(58)	
	Private	84(42)	
Hand Washing Practices (Mother)	Before using Toilet	Yes	56(28)
		No	144(72)
	After using Toilet	Yes	198(99)
		No	2(1)
	Before Cooking	Yes	70(35)
		No	130(65)
Before Feeding	Yes	98(49)	
	No	102(51)	
Open Air Defecation Practice	Yes	124(62)	
	No	76(38)	

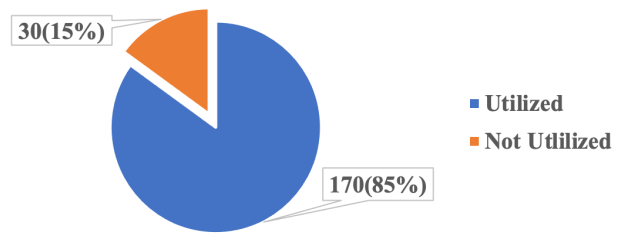


Figure 6 : Frequency of ICDS Service Utilization

### 6. ANTHROPOMETRIC MEASUREMENTS

The Prevalence of underweight (weight for age < median -2SD), stunting (height for age < median -2SD) and wasting (weight for height < median - 2SD ) according to age and gender were shown in figure 7. None of the child had severe malnutrition (< median - 3SD).

The overall prevalence of underweight, stunting and Wasting among children < 5 years in Alamathi village was 36.5%, 27.5% and 36.4% respectively.

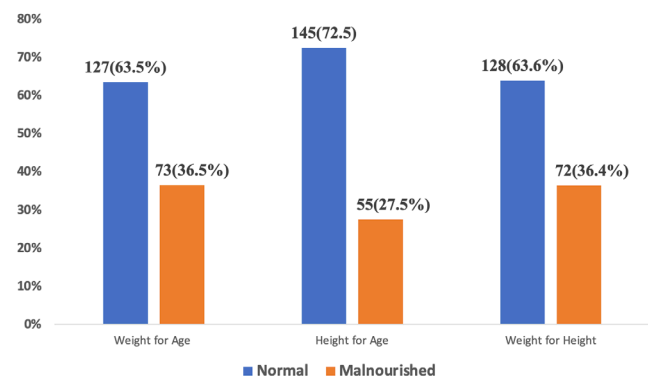


Figure 7 : Prevalance of Malnutrition Among Study Participants

### 7. DETERMINANTS OF MALNUTRITION AMONG STUDY PARTICIPANTS

\* Statistically Significant association with p value <0.05 with Chisquare test

Gender of the child didn't influence the occurrence of malnutrition in our study, Family size with total members more than 4 had significant association with the occurrence of stunting among study participants. Mother's education had significant association with occurrence of stunting and wasting and socio-economic factors played a role in occurrence of underweight among study participants as shown in (Table 3).

Table 3: Association between Socio-Demographic Characteristics and Malnutrition

Variable		Underweight		p Value		Stunting		p Value		Wastage		p Value	
		Yes	No			Yes	No			Yes	No		
<b>Socio-Demographic</b>													
Gender of the Child	Male	34 (35.4)	62 (64.6)	0.760	22 (22.9)	74 (77.1)	0.163	30 (31.3)	66 (68.8)	0.179			
	Female	39 (37.5)	65 (62.5)		33 (31.7)	71 (68.3)		42 (40.4)	62 (59.6)				
Family Size	≤4	38 (30.6)	86 (69.4)	0.08	26 (21)	98 (79)	0.016*	43 (34.7)	81 (65.3)	0.509			
	5-9	34 (46.6)	39 (53.4)		27 (37)	46 (63)		27 (37)	46 (63)				
	≥10	1 (33.3)	2 (66.7)		2 (66.7)	1 (33.3)		2 (66.7)	1 (33.3)				
Literacy Status of the mother	Graduate	8 (57.1)	6 (42.9)	0.206	8 (57.1)	6 (42.9)	0.0403*	10 (71.4)	4 (28.6)	0.022*			
	Higher Secondary	7 (38.9)	11 (61.1)		5 (27.8)	13 (72.2)		8 (44.4)	10 (55.6)				
	High School	37 (38.9)	58 (61.1)		27 (28.4)	68 (71.6)		27 (28.4)	68 (71.6)				
	Primary Education	14 (34.1)	27 (65.9)		11 (26.8)	30 (73.2)		17 (41.5)	24 (58.5)				
	Illiterate	7 (21.9)	25 (78.1)		4 (12.5)	28 (87.5)		10 (31.3)	22 (68.8)				
		5 (29.4)	12 (70.6)		3 (17.6)	14 (82.4)		7 (41.2)	10 (58.8)				
Socio-economic Class	Upper	13 (37.1)	22 (62.9)	0.045*	8 (22.9)	27 (77.1)	0.276	9 (25.7)	26 (74.3)	0.360			
	Middle	20 (27)	54 (73)		21 (28.4)	53 (71.6)		24 (32.4)	50 (67.6)				
	Lower	23 (41.8)	32 (58.2)		14 (25.5)	41 (74.5)		25 (45.5)	30 (54.5)				
	Upper	12 (63.2)	7 (36.8)		9 (47.4)	10 (52.6)		7 (36.8)	12 (63.2)				
	Middle												
	Lower												

\* Statistically Significant association with p value <0.05 with Chisquare test

Children who were exclusively breast fed till 6 months of age, initiation of weaning at appropriate time 6-10 months and early initiation of breast feeding after delivery had normal nutritional status which was statistically significant as shown in (Table 4).

### 8 .ASSOCIATION BETWEEN HYGIENE AND NUTRITIONAL STATUS

There was no association statistical between source of drinking water, toilet facility used by family with malnutrition in our study, and there was significant association between hand hygiene practice and open air defecation with malnutrition.

Table 4: Association between Child Feeding Practices and Malnutrition

Variable		Underweight		Stunting		Wastage	
		Yes	No	Yes	No	Yes	No
<b>Child Feeding Practice</b>							
Duration between Delivery and Initiation of Breast Feeding	No Breast Feeding	3 (75)	1 (25)	3 (75)	1 (25)	3 (75)	1 (25)
	Within 1 hr	39 (33.1)	79 (66.9)	32 (27.1)	86 (72.9)	43 (36.4)	75 (63.6)
	1-3 hrs	11 (37.9)	18 (62.1)	8 (27.6)	21 (72.4)	8 (27.6)	21 (72.4)
	4-11 hrs	11 (45.8)	13 (54.2)	4 (16.7)	20 (83.3)	11 (45.8)	13 (54.2)
	12-24 hrs	2 (50)	2 (50)	2 (50)	2 (50)	3 (75)	1 (25)
After 24 hrs	7 (33.3)	14 (66.7)	5 (23.8)	16 (76.2)	7 (31.8)	19 (88.2)	
Duration of Exclusive Breast Feeding	Not Fed	3 (75)	1 (25)	3 (75)	1 (25)	3 (75)	1 (25)
	Till 2 months	6 (55)	5 (55)	5 (45)	6 (55)	3 (21)	8 (79)
	Till 4 months	25 (35.2)	46 (64.8)	18 (25.4)	53 (74.6)	30 (42.3)	41 (57.7)
	Till 6 months	34 (33.3)	68 (66.7)	25 (24.5)	77 (75.5)	29 (28.4)	73 (71.6)
	>6 months	4 (44.4)	5 (55.6)	4 (44.4)	5 (55.6)	7 (77.8)	2 (22.2)
	Not yet Stopped	1 (33.3)	2 (66.7)	-	3 (100)	1 (33.3)	2 (66.7)
Initiation of Weaning	Before 6 Months	39 (47.5)	43 (52.5)	35 (43)	47 (57)	40 (48)	42 (52)
	6-10 months	45 (43)	60 (57)	40 (48)	65 (52)	44 (41)	61 (59)
	>10 months	5 (71)	2 (29)	4 (57)	3 (43)	6 (85)	1 (15)
	Not yet started	5 (83)	1 (17)	4 (66)	2 (44)	5 (83)	1 (17)

\* Statistically Significant association with p value <0.05 with Chisquare test

Utilization of ICDS service was not associated with malnutrition, while immunization status of the child had been significantly associated with stunting and wasting as shown in (Table 5).

### DISCUSSION

Among 200 children The overall prevalence of underweight among children < 5 years in Alamathi village is much higher (36.5%) compared to that reported for state of T.N by NFHS 4 (29.8%), and the overall prevalence of stunting among children < 5 years in Alamathi village is similar compared to that reported for state T.N by NFHS 4 (27.5%).<sup>5</sup>

Table 5: Association between Utilization of Health Services and Malnutrition

Variable		Underweight		Stunting		Wastage	
		Yes	No	Yes	No	Yes	No
<b>Immunization</b>							
Immunization Status	Fully Immunized	68 (36.2)	120 (63.8)	47 (25)	141 (75)	64 (34)	124 (66)
	Partially Immunized	4 (40)	6 (60)	7 (70)	3 (30)	6 (60)	4 (40)
	Not Immunized	1 (50)	1 (50)	1 (50)	1 (50)	1 (50)	1 (50)
ICDS Service	Utilized	60 (35.3)	110 (64.7)	47 (27.6)	123 (72.4)	61 (35.9)	109 (64.1)
	Not Utilized	13 (43.3)	17 (56.7)	8 (26.7)	22 (73.3)	11 (36.7)	19 (63.3)

Majority (52%) were female, nearly 49.5% of them were in age group of 12-36 months, While in other studies by sawan kumar et al, Geethanjali et al had higher proportion of male children and more than 50% belonged to age group of 48-60

months.<sup>7,8</sup> In our study 47.5% of mothers had completed their education till high school which was similar to study done at Berhampur, odisha by geethanjali et al. Similar to study done at Belgavi, majority of them belonged to upper-lower class.<sup>7,8</sup>

According to a study published by philip et al, there lies a significant association between prevalence of malnutrition with mother's literacy and family size; similarly in our study also there was a significant association between mother's literacy and family size with stunting and wasting.<sup>9</sup>

A study done in Chandigarh by Dinesh kumar et al showed that there was a significant relationship between improvement in nutritional status of under five children and adoption of proper infant-feeding practices by their mothers.

The proportions of stunting among children whose mothers initiated breastfeeding within six hours was significantly less ( $P < 0.02$ ) than that for those whose mothers initiated breastfeeding after six hours which was similar to our study.<sup>10</sup>

According to a study published by Jee Hyun Rah and et al on association between household sanitation and personal hygiene with child stunting, it was seen that there was a 16-39% reduced odds of stunting among children while in our study there was no significant association between household practices and malnutrition.<sup>11</sup>

According to a study published by Philip et al showed that there was a significant association between immunisation status and malnutrition among children below 5 years which was similar to our findings.<sup>9</sup>

In an article published by Srinivasan et al., they found a positive association between utilisation of ICDS programme and reduction of malnutrition in India while in our study there was no significant association between malnutrition and utilization of ICDS Service.<sup>6</sup>

## CONCLUSION

The study revealed that the prevalence of malnutrition was relatively high in alamadhi village compared to urban areas. According to investigations of independent variables with dependent variables, time of initiation of breastfeeding, time of stoppage of breastfeeding, time of weaning, immunization status, household hygienic practices showed significant statistical association. Also household size is also associated with malnutrition.

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