

A study on Prevalence and Determinants of Malnutrition among under Five Children in a Rural Area, Salem District, Tamil Nadu

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ABSTRACT

Background : The Prevalence of malnutrition among under-five children is very high in many of the developing countries of the world. As a step towards reducing the prevalence, there is need to identify the important determinants of under-nutrition and take necessary measures to prevent it.

Objectives:

1. To find out the prevalence of malnutrition among under five children.
2. To identify the socio-demographic and associated risk factors contributing to malnutrition among the under five children.

Materials & Methods: It is a cross-sectional study done among 200 under-five children of Anganwadicentres nearby VMKV Medical College Hospital, Salem. Mothers of under five children were interviewed regarding socio-demographic characteristics by structured questionnaire. Anthropometric measurements and clinical examination were done to assess the nutritional status of under five children.

Results: The prevalence of malnutrition on clinical examination was 38.5%, where majority of children had thin, sparse and brown hair. Around 42.5% of the children had mid arm circumference of (<13.5cm). Mother's education and number of siblings in the family had significantly influenced the nutritional status among the surveyed children. Among the associated risk factors - open air defaecation, not trimming nails regularly and not taking bath daily significantly resulted in under-nutrition.

Conclusion: The malnutrition prevalence was high among the study population. Hence efforts like improving the female literacy, health education on the various risk factors should be made by the policy makers.

Keywords: Malnutrition, Midarm circumference and Anganwadi children.

INTRODUCTION:

Malnutrition contributes to more than one-third of all deaths of under-five children worldwide.¹ Currently, 195 million of under-five children are affected by malnutrition, 90% of them live in sub-Saharan Africa and South Asia. At least 20 million children suffer from severe acute malnutrition (SAM), and another 175 million are undernourished.²

Malnutrition, commonly termed for under-nutrition is a major public health problem in India particularly affecting under five preschool children. This accounts to 22% of the burden of disease in India.³ Malnutrition is a complex and multidimensional issue affected by poverty, inadequate food consumption, inequitable food distribution, infections, improper infant and child feeding and care practices, equity and gender imbalances, poor sanitary and environmental

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conditions and limited access to quality health, education and social services. Children are the worst victims of these circumstances.⁴

According to the Rapid Survey on Children, about 18.5% of children are born with low birth weight, 29.4% are underweight (< 5 years of age), 38.7% are stunted, 15.1% are wasted and < 1% children under 5 years are having Kwashiorkor / Marasmus.⁵

Comprehensive studies regarding causative, aggravating and associated factors leading to malnutrition are required, to study the problem in depth and formulate better health policies. Therefore, the present study was carried out to assess the pattern of malnutrition among under five children in the selected Anganwadi centres in a rural area of Salem district, Tamil Nadu.

OBJECTIVES:

1. To find out the prevalence of malnutrition among under five children.
2. To identify the socio-demographic and associated risk factors contributing to malnutrition among the under five children.

MATERIALS AND METHODS:

A cross sectional study was conducted among the under five children in the Anganwadi centres nearby VMKV Medical College Hospital, Salem, from Jan 2018 to June 2018 for a period of 6 months. All the Anganwadi centres about 10, in and around VMKV Medical College, were included in the study. The total number of children in these centres were 200.

Mothers of under five children were interviewed regarding socio-demographic characteristics by structured questionnaire and they were taken

informed consent to examine their children. Ethical clearance to conduct the study was obtained from Institutional Ethical Committee. Clinical examination of the children was done by the investigator to look for the signs of malnutrition. Anthropometric measurements such as height, weight and mid arm circumference were recorded. Standard inch tape was used to measure the height and the mid upper arm circumference.

ANALYSIS:

Statistical tests like Proportions and Chi-square test was used.

Data was tabulated on Microsoft excel sheets and analyzed using software SPSS 16.

RESULTS:

Table 1 shows that majority of children in the study population were in the age group of 2-3 years, with age ranging from 1 to 5 years. The mean age of children were 3.347 years with SD 0.6729. Out of 200 children, 84 (42%) were boys and 116 (58%) were girls. The age and sex distribution of children shows out of 1 child in age group of 1-2 yrs, 1 (100%) was boy. Out of 102 children in age group of 2-3 yrs, 39 (38.2%) were boys and 63 (61.7%) were girls. Out of 86 children in age group of 3-4 yrs, 39 (45.3%) were boys and 47 (54.6%) were girls and out of 11 children in age group of 4-5 yrs, 5 (45.4%) were boys and 6 (54.5%) were girls.

Table 1. Age and Sex distribution of the study population

Age group	Boys(frequency)	Girls (frequency)	Total
1-2 years	1(100%)	0(0%)	1
2-3	39(38.2%)	63(61.7%)	102
3-4	39(45.3%)	47(54.6%)	86
4-5	5(45.4%)	6(54.5%)	11
Total	84(42.0%)	116(58.0%)	200

Mean age= 3.347 yrs, range=1-5 years,SD=0.6729

Table 2. shows. Distribution of the children on clinical examination for Malnutrition

The prevalence of malnutrition on clinical examination was 77 (38.5%), where all of the children had thin, sparse and brown hair. About 28 (14%) children were thinly built and bony. 1 (0.5%) of them had pitting edema and 1 (0.5%) had pot belly. Many children had more than one clinical sign on examination.(n=200)

Table 2. Distribution of the children on clinical examination for Malnutrition

*Clinical examination	Children with Malnutrition(%) (n=200)
Build/skin & bony	28(14%)
Hair – thin, sparse, brown	77(38.5%)
Edema	1(0.5%)
Pot belly	1(0.5%)
Normal	123(61.5)

*More than one clinical sign were seen in many children

Table.3.shows Distribution of Children with grading of malnutrition by their Mid-Arm Circumference

Table-3. Distribution of Children with grading of malnutrition by their Mid-Arm Circumference

Mid arm circumference (cm)	Grading of malnutrition	Number of children (%)
>13.5	Normal	115(57.5)
12.5-13.5	Mild-moderate	82(41.0)
<12.5	Severe	3(1.5)
Total		200

It was found that 82(41%) children had mid arm circumference between 12.5-13.5 cms, which corresponds to mild to moderate malnutrition, while 3(1.5%) children had mid arm circumference of less than 12.5cms, corresponding to severe malnutrition. About 115(57.5%) children had mid arm circumference of > 13.5cms. (Table 3)

Table.4.Socio-demographic profile of the children with malnutrition

Socio-demographic Factors	Total children	Children with Malnutrition	Percentage	Level of significance
FAMILY MEMBERS				
<4	148	62	41.8%	$\chi^2 = 1.51$ p> 0.05
4-7	50	23	46%	
>7	2	0	0%	
NO.OF SIBLINGS				
<2	90	34	37.8%	$\chi^2 = 3.96$ p<0.05
2-4	110	51	46.3%	
FATHER'S EDUCATION				
Illiterate	42	23	54.78%	$\chi^2 = 5.19$ p>0.05
Primary	34	10	29.41%	
Secondary	49	19	38.77%	
Higher sec	48	23	47.90%	
College	27	10	37.03%	
MOTHER'S EDUCATION				
Illiterate	45	26	57.78%	$\chi^2 = 7.35$ p<0.05
Primary	47	20	42.55%	
Secondary	30	13	46.66%	
Higher sec	69	26	39.13%	
College	9	0	0%	
FATHER'S OCCUPATION				
Unskilled	45	22	48.89%	$\chi^2 = 0.298$ p>0.05
Semiskilled	108	45	41.67%	
Skilled	47	18	42.55%	
MOTHERS OCCUPATION				
Unskilled	138	65	47.10%	$\chi^2 = 2.57$ p>0.05
Semiskilled	58	19	32.75%	
Skilled	4	1	25.0%	

Table 4 shows the socio- demographic profile of children with malnutrition. The factors such as No. of family members, No. of siblings, education of the father and mother, occupation of father and mother had influenced the occurrence of under-nutrition among the study population.

Table.5. Associated Risk Factors contributing to malnutrition among children

Associated risk factors for malnutrition	Total children	Children with Malnutrition	Percentage	Level of significance
OPEN AIR DEFECACTION				
Yes	125	75	60%	$\chi^2 = 5.13$ p<0.05
No	75	10	13.3%	
TAKING BATH DAILY				
Yes	181	72	39.7%	$\chi^2 = 5.85$ p<0.02
No	19	13	68.4%	
WALKING ON BARE FOOT				
Yes	70	33	47.1%	$\chi^2 = 0.94$ p>0.05
No	130	52	40%	
CUTTING NAILS REGULARLY				
Yes	143	40	28%	$\chi^2 = 6.69$ p<0.01
No	57	45	78.9%	

Table 5 shows associated risk factors of children with malnutrition. Open air defecation, not taking regular bath, walking on bare foot and not trimming nails regularly were the risk factors taken for the study. Results showed that majority of the children who practiced open air defecation 75(60%), those who didn't take bath daily 13(68.4%) and those who didn't trim their nails regularly 45(78.9%) were

suffering from malnutrition and found to be statistically significant ($p < 0.05$). Children with risk factors such as walking on bare foot 33 (47.1%) also had under-nutrition.

DISCUSSION:

Under-nutrition is a major public health problem and continues to be a cause of ill-health and premature mortality among children in developing countries like India.⁶

The preschool children constitute about 15% of total population and accounts for 40% of total deaths in India, notoriously caught with the risk of malnutrition. Their growth is an important indicator of child health and community's nutritional status. Growth failure is a common problem and is the first sign of protein-energy malnutrition (PEM) and poor health.⁷

Integrated and Child Development Services (ICDS) was first initiated in 1975 which is the largest national community based nutritional programme in the world. The target groups are children under-six years of age and pregnant and nursing mothers (15-44 years).⁸

Anthropometrics provide relatively simple and convenient indicators of PEM status of children. Measurement of growth has always been an important tool for assessing the nutritional status of children which involves the use of reference standards.⁹ In Gomez classification, weight-for-age (under-nutrition) is commonly used to classify children into nutrition grades; normal >90% of the standard, grade-I or mild 75-90%, grade-II or moderate 60-74% and grade-III or severe <60% of the standard of NCHS.¹⁰

A study done in Orissa among the pre school children found that the proportion of children (aged 1-3 years) by Gomez classification had normal nutrition grade (34.5%-37.4%) less than the malnourished children (62.6%-65.5%). Grade-I malnutrition (having body weight deficit <20%) is almost twice the grade-II (weight deficit <30%) and less than 2% are having grade-III&IV (weight deficit <40%) malnutrition.¹¹

A Study done by Izhar Hasan on 500 government school children of 8-14 years in Azad nagar, Bangalore found the prevalence of malnutrition was 68%, while in the present study the prevalence of malnutrition was 42.5%.¹²

A study by Priyadarsini et al, in which a total of 100 under 5 children were examined in Chidambaram rural area, found clinical examination showing about 26% of the children with malnutrition [thin built (18%) and sparse hair (8%)], which is in contrast to the present study, the prevalence of malnutrition on clinical examination was 50.5%. Weight for age by Gomez classification shows around 28% of the children had malnutrition [mild malnutrition (24%), moderate malnutrition (4%)] in contrast to this, the present study found that 52% of the children had malnutrition [mild malnutrition (34%), moderate malnutrition (13%)]. Mid upper arm circumference was taken and 9% of the children found to have mild to moderate malnutrition. In contrast to this, the present study showed that 24.5% of the children had mild to moderate malnutrition by mid upper arm circumference.¹³

Shubhada S. Avachat et al in their study on malnutrition (under nutrition) among under five children in a section of rural area found that the

prevalence of malnutrition was 9% by Mid upper arm circumference, which is in contrast to our study, where the prevalence was 42.5% by Mid upper arm circumference.¹⁴ Gupta et al found in his study, preschool (under five) children notoriously fraught with the risk of malnutrition and the prevalence of malnutrition varied between 50-80%, which is similar to our study with the prevalence of malnutrition of 52%.⁷

The rates of underweight of the children of the present study were much higher than those reported in an earlier study on ICDS children from Chapra, West Bengal which had reported rates of 31.0 % severity of malnutrition.¹⁵

A cross sectional study of nutritional status among 1920 anganwadi children of Nagamangala Taluk, Mandya District, Karnataka state which involved assessment of the nutritional status by clinical examination, anthropometry and health records maintained in Anganwadi centres. Diffuse pigmentation on face was seen in 13.18% of male children compared to 10.95 % in female children. Prevalence of pale conjunctiva was 23.02%. Presence of caries teeth was 15.36%. Presence of dry and scaly skin in children was 11.41%.¹⁶ whereas in our study, distribution of the children with malnutrition by clinical examination found majority of children 38.5% had thin, sparse and brown hair. About 14% children were thinly built and bony. 0.5% of them had edema and 0.5% had pot belly. Many of them had more than one clinical sign.

Pradeep et al in his study found the educational status of the father to have significant association with malnutrition (p-value: 0.019). In contrast to

this the present study found that educational status of the mother had significantly influenced malnutrition among the surveyed children. Half of the children (54.7%) had poor personal hygiene which is similar to the present study, where open air defecation, not taking regular bath and not trimming nails regularly had significantly ($p < 0.05$) influenced the malnutrition in the study population.¹⁷

A study by M.MA.KhanKhattak et al found in Pakistan that their existed strong association between risk factors and nutritional status such as large family size, low income and increased child number in rural areas , similar to our study.¹⁸

A study done in Bangladesh found results of multi variate linear regression models showed that height of mothers, birth weight of children, education of fathers, knowledge of mothers on nutrition, and frequency of feeding were the most significant factors that had an independent and direct influence on the nutritional status of children as similar to the present study, where educational status of the mother and more number of siblings in the family had significant association for malnutrition among children.($p < 0.05$).¹⁹

CONCLUSION:

Prevalence of under-nutrition was found to be high among the study population. There is no significant reduction in prevalence of malnutrition in spite of various national health programmes, as shown in different studies. As nutrition is a complex and multidimensional issue, comprehensive studies regarding causative, aggravating and associated factors leading to malnutrition are required to be

studied, to know the problem in depth and formulate better health policies. Hence government and NGO's should address this issue and take necessary measures to improve the nutritional status of these children.

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INTEREST OF CONFLICT: None

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