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ASSESSMENT OF MALNUTRITION STATUS IN THE CHILDREN OF AGE 6 MONTHS TO 59 MONTHS RESIDING IN RURAL AND URBAN AREAS OF MEDCHAL-MALKAJGIRI DISTRICT

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ABSTRACT

Background: "Malnutrition" is described as a dietary circumstance where in a deficiency or excess (or imbalance) of energy, protein, and different vitamins can purpose vast terrible outcomes at the tissue/frame, relying on frame characteristic and medical outcome. **Methods:** The observational study was undertaken to assess the nutritional status of the children of age 6 months to 59 months residing in the rural and urban areas of Medchal- Malkajgiri district. **Results:** Altogether 78 children aged 6-59 months were recruited for this study. Among them 62% were boys and 51% were girls. According to MUAC criteria, 21% of children had suffered from Severe Acute Malnutrition (SAM), 42% had Moderate Acute Malnutrition (MAM) and 37% had adequate nutritional status. According to Stunting criteria, 43% of children had suffered from Severe Acute Malnutrition (SAM), 18% had Moderate Acute Malnutrition (MAM) and 39% had adequate nutritional status. According to wasting criteria, 75% of children had suffered from Severe Acute Malnutrition (SAM), 5% had Moderate Acute Malnutrition (MAM) and 20% had adequate nutritional status. According to Underweight criteria, 88% of children had suffered from Severe Acute Malnutrition (SAM), 6% had Moderate Acute Malnutrition (MAM) and 6% had adequate nutritional status. **Conclusions**: The problems of the low stock of extant, hunger, hungriness, malnutrition, agricultural illiteracy, poor antenatal care, disease, poor sanitary and housing facilities, etc. have to be improved totally by the

implementation of policy that already exists.

KEYWORDS: Malnutrition, mid-upper arm circumference (MUAC), stunting. Wasting.

INTRODUCTION

A better-nourished world is a better world. The global community is grappling with multiple burdens of malnutrition. Eighty-eight percent of countries face a serious burden of either two or three forms of malnutrition.[1] These conditions are mostly seen in low and middle-income countries. In these countries, rates of immatureness fleshiness and avoirdupois are acceleratory. In International Food Policy and Research Institute (IFPRI) publishes the GHI (Global Hunger Index) according to their interrogation for 2019, nearly all numerate 119 countries Bharat is having 102 ranks. The World Bank estimates that India is one of the highest-ranking countries in the world for the number of children suffering from malnutrition. The prevalence of underweight children in India is among the highest in the world and is nearly double that of Sub Saharan Africa with dire consequences for mobility, mortality, productivity, and economic growth.[2]

World Health Organization (WHO) reported that the prevalence of stunting and underweight among children aged under 5 years globally in 2017 decreased; those were 13.5% and 22.2%, respectively. However, more than half of all stunted children under 5 years lived in Asia and Africa.[3,4] Stunting refers to a child who is too short for his or her age; these children could suffer severe irreversible physical, cognitive damage and these devastating effects can last a lifetime and even affect the next generation.[5] Malnutrition continues to be a serious public health concern especially in conflict and post-conflict recovery situations. Children weakened by all forms of malnutrition often die from diseases which are both preventable and easy-to-treat, such as diarrhea, pneumonia, and malaria.[6]

It is both medical and social disorder.[7] True underweight may be a sign of dietary, health, or emotional problems.[8] According to the WHO growth standard, underweight in under-fve is measured by weight for age and it is the best global indicator of wellbeing in children.[9,10] Underweight continues as a major public health problem in developing countries. It is the risk factor of the greatest loss of disability-adjusted life years (DALYs[11]). Even though child underweight is a global problem but the magnitude varies.[12]

Underweight is highly associated with poverty.[13] In Ethiopia underweight in children is one

of the public health problems.[9] In Sub-Saharan Africa (SSA) underweight is contributing to morbidity and mortality in under 5 years.[14] Te period vulnerability to nutritional deficiencies is in the early life of pregnancy to 2 years old. Chronic under nutrition in early childhood also results in diminished cognitive and physical development.[15,16]

Half of all deaths in under-5 children were attributed to under nutrition. Tis translate into the unnecessary loss of about 3 million young lives a year.[17] According to the 2013 united nation children's fund, WHO and the World Bank joint database, globally an estimated 101 million children under 5 years of age or 16% were underweight in 2011.[18] West and Central Africa have experienced the smallest relative decrease, with an underweight prevalence of 22% in 2014, down from 31% in 1990.[19] Although the worldwide prevalence of underweight among under-fve children has decreased since 1990, still millions of children remain at risk.[20]

Aggregation from a longitudinal ponder on the alignment between the status of measurement and children mortality about 6 - 59 months age having a reinforced tie between the unreasonable metric for their age deficits and deaths rates. In developing countries in 1995 out of 11.65 million deaths of beneath five-year children are of roughly 6.5 million is estimated or 54.5% of young children deaths were related with malnutrition.

METHODOLOGY

Study Design

It is a community based observational study for the assessment of malnutrition status in children of age 6 months to 59 months residing in rural and urban areas of Medchal-Malkajgiri. It is a community based observational study conducted for 6 months and about 76 patients met the study criteria has been comprised in the study. The Institutional Human Ethical Committee of GCPK approved the study. The code is given- GCPK/IEC/NOV2020-21/B06. The required data were collected from the patient representatives through respective data collection forms. The acquired data was evaluated based on the anthropometric method.

Inclusion criteria for this study was Children of age group 6 months to 59 months, Weight for Height <-3SD below mean represents Severe Acute Malnutrition, Visible severe wasting Bipedal oedema, Mid upper arm circumference after taking written informed consent forms from caretaker these criteria were included in the study. Exclusion criteria Children < 6months and > 59 months, Causes of oedema other SAM Children with any medical

complications or social issue needing more detailed assessment. Parents or relatives will be explained about the study, its aim and objective. Written consent is taken and then data is collected in the case included. The data will be collected in the proforma which included the demographic details, clinical history, family history and personal history, nutritional status and diet therapy.

SOURCE OF DATA COLLECTION

Anthropometric Measurements

Anthropometrics are a set of non - invasive, quantitative body measurements that are used to assessing the maturation and fitness. Anthropometric measurements including the weight of the body, height and circumference of the head, help the providers to determine that the growth of the child and it can indicate that the health of the child is at risk. Adolsents and childrn treatment protocols are widely framed on their anthropmetric measurements.

Z Score

Z score is to define low weight or lack of nutrition in children. The No. of SD of observation is higher or lower than the population mean, children with malnutrition is critical for estimation of correct treatment. Z scores are to be used to determining the undernutrition according to weight for height (WFH), weight for their age (WFA), head circumference of head (HC). Malnutrition levels are based on body mass index according to their age. Z scores are referred to as follows: mild malnutrition is about -1 to -1.9, moderate malnutrition about -2 to 2.9 and < -3.0 refer to severe malnutrition.

RESULTS

- **BASED ON AGE**

The mean weight (SD) of the children was 6.70 kg (1.745). The mean height (SD) of the children was 72.28 cm (8.643). The head-circumference (SD) of the children was 42.23 (2.030). The mean MUAC (SD) of the children was 12.03 cm (1.351). The P-value was found to be <0.001 so it was significant.

- **6 MONTHS TO 11 MONTHS**

Out of the 76 children studied 30 children fall in the age group of 6 months to 11 months.

The mean weight (SD) of the children was 5.38 kg (1.061). The mean height (SD) of the children was 65.58 cm (1.805). The head-circumference (SD) of the children was 40.67 cm (1.768). The mean MUAC (SD) of the children was 11.44 cm (1.245).

❖ **12 MONTHS TO 17 MONTHS**

Out of the 76 children studied 16 children fall in the age group of 12 months to 17 months. The mean weight (SD) of the children was 7.01 kg (1.720). The mean height (SD) of the children was 71.34 cm (4.756). The head-circumference (SD) of the children was 42.5062 cm (1.609). The mean MUAC (SD) of the children was 11.95 cm (1.171).

❖ **18 MONTHS TO 23 MONTHS**

Out of the 76 children studied 12 children fall in the age group of 18 months to 23 months. The mean weight (SD) of the children was 6.91 kg (0.523). The mean height (SD) of the children was 75.67 cm (3.626). The head-circumference (SD) of the children was 43.12 cm (1.383). The mean MUAC (SD) of the children was 11.92 cm (0.8646).

❖ **24 MONTHS TO 29 MONTHS**

Out of the 76 children studied 10 children fall in the age group of 24 months to 29 months. The mean weight (SD) of the children was 8.08 kg (1.315). The mean height (SD) of the children was 78.95 cm (6.567). The head-circumference (SD) of the children was 43.82 cm (1.153). The mean MUAC (SD) of the children was 13.16 cm (1.172).

❖ **30 MONTHS TO 35 MONTHS**

Out of the 76 children studied 3 children fall in the age group of 30 months to 35 months. The mean weight (SD) of the children was 8.08 kg (1.315). The mean height (SD) of the children was 78.95 cm (6.567). The head-circumference (SD) of the children was 43.82 cm (1.153). The mean MUAC (SD) of the children was 13.16 cm (1.172).

❖ **36 MONTHS TO 41 MONTHS**

Out of the 76 children studied 1 child fall in the age group of 36 months to 41 months. The mean weight (SD) of the child was 9.65 kg (0). The mean height (SD) of the child was 89 cm (0). The head-circumference (SD) of the child was 45 cm (0). The mean MUAC (SD) of the child was 14.5 cm (0).

❖ **48 MONTHS TO 53 MONTHS**

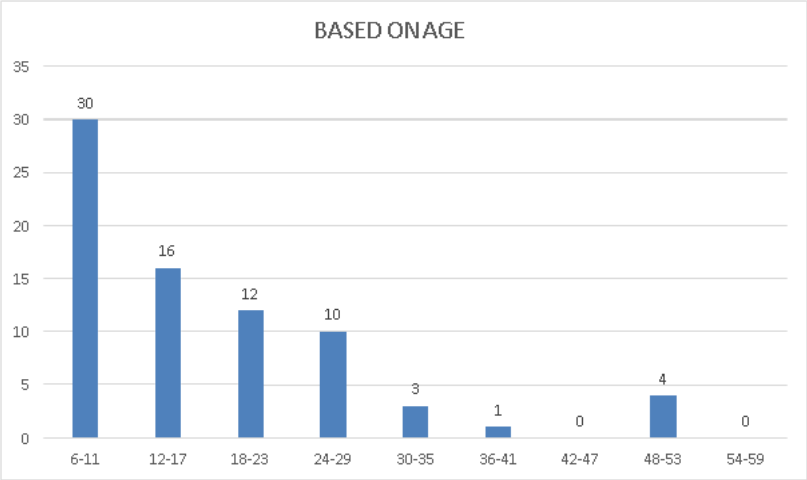
Out of the 76 children studied 4 children fall in the age group of 48 months to 53 months. The mean weight (SD) of the children was 9.162 kg (1.309). The mean height (SD) of the children was 87 cm (8.165). The head-circumference (SD) of the children was 44.57 cm (0.842). The mean MUAC (SD) of the children was 13.12 cm (1.547).

Of the 76 children studied 47 were males and 29 were females.

Table 1: Results Based On Age.

AGE (In Months)	NUMBER OF SUBJECTS (In Numbers)
6-11	30
12-17	16
18-23	12
24-29	10
30-35	3
36-41	1
42-47	0
48-53	4
54-59	0
TOTAL	76

RESULT



Graph 1: Based On Age.

- **BASED ON SEX**

❖ **MALE**

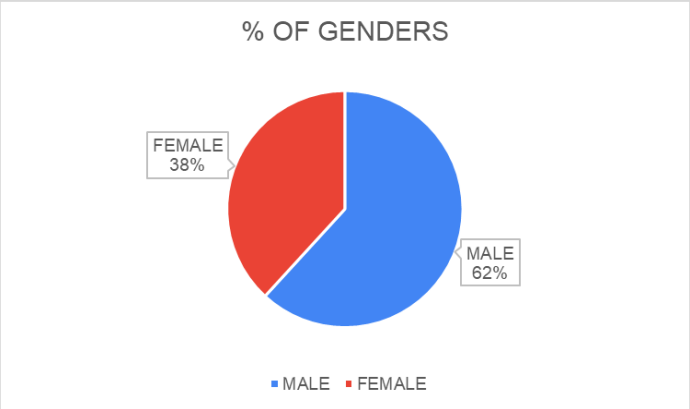
The mean (SD) height of the males was 73.41 cm (7.483) and the mean weight (SD) for males was 7.10 kg (1.553). The head-circumference (SD) of the males was 42.23 cm (2.030). The mean MUAC (SD) of the males was 12.03 cm (1.351).

❖ **FEMALE**

The mean (SD) height of the females was 69.80 cm (9.89) and the mean weight (SD) for females was 6.07 kg (1.874). The head-circumference (SD) of the females was 42.23 cm (2.030). The mean MUAC (SD) of the females was 12.03 cm (1.351).

Table – 2: Results Based On Sex – II.

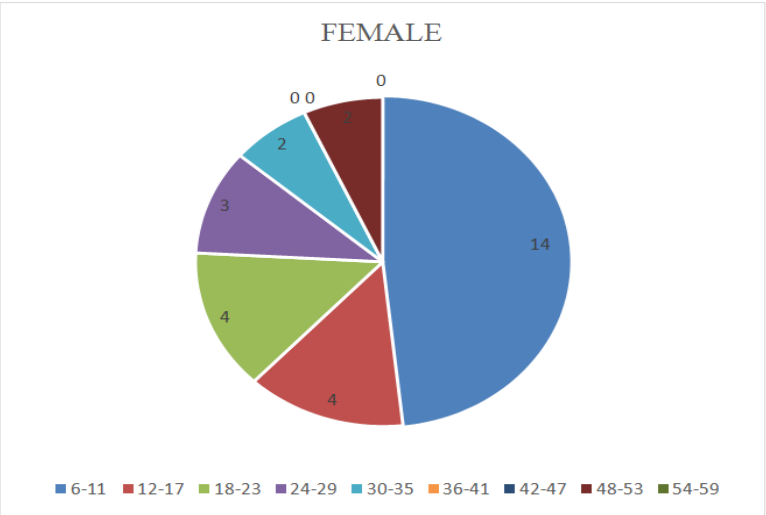
GENDER	NO OF SUBJECTS	PERCENTAGE
MALE	47	61.84
FEMALE	29	38.15
TOTAL	76	100%



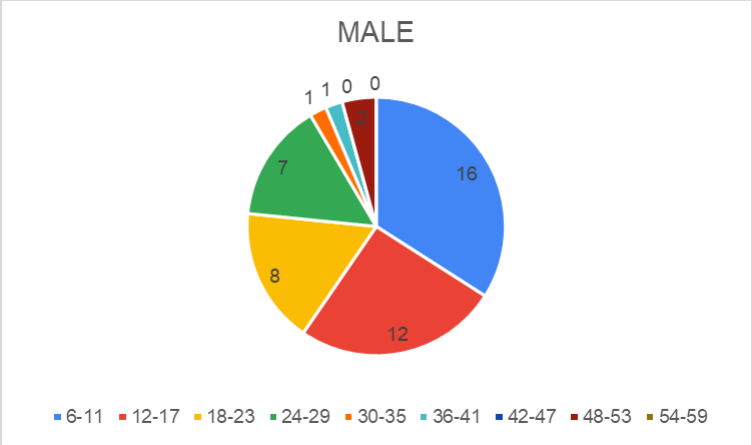
Pie Chart – 1: Results Based On Sex – I.

Table 3: Results Based On Sex – I.

AGE	NUMBER OF SUBJECTS	MALE	FEMALE
6-11	30	16	14
12-17	16	12	4
18-23	12	8	4
24-29	10	7	3
30-35	3	1	2
36-41	1	1	0
42-47	0	0	0
48-53	4	2	2
54-59	0	0	0
TOTAL	76	47	29



Pie chart – 2: Results Based On Sex – II.



Pie Chart – 3: Results Based On Sex – III.

➢ **BASED ON LOCALITY**

❖ **RURAL**

Out of the 76 children studied 50 children belonged to the Rural area.

The mean weight (SD) of the children was 6.53 kg (1.564). The mean height (SD) of the children was 70.81 cm (1.805). The head-circumference (SD) of the children was 41.85 (1.805). The mean MUAC (SD) of the children was 12.10 cm (1.334).

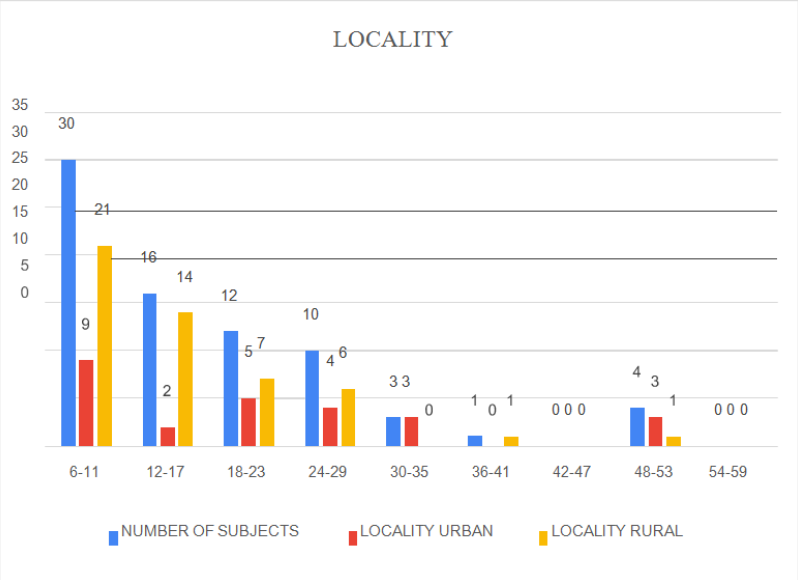
❖ **URBAN**

Out of the 76 children studied 26 belonged to the Urban area.

The mean weight (SD) of the children was 7.05 kg (2.307). The mean height (SD) of the children was 75.11 cm (10.711). The head-circumference (SD) of the children was 42.97 cm (2.264). The mean MUAC (SD) of the children was 11.90 cm (1.399).

Table 4: Results Based On Locality.

AGE (In Months)	NUMBER OF SUBJECTS (In Numbers)	LOCALITY	
		URBAN	RURAL
6-11	30	9	21
12-17	16	2	14
18-23	12	5	7
24-29	10	4	6
30-35	3	3	0
36-41	1	0	1
42-47	0	0	0
48-53	4	3	1
54-59	0	0	0
TOTAL	**76**	**26**	**50**



Graph 2: Results Based On Locality.

➢ **BASED ON SOCIOECONOMIC STATUS**

❖ **LOWER-LOWER CLASS (LL)**

Out of the 76 children studied 09 children belonged to LL status.

The mean weight (SD) of the children was 6.02 kg (2.291). The mean height (SD) of the children was 66.78 cm (10.485). The head-circumference (SD) of the children was 41.03 cm (2.839). The mean MUAC (SD) of the children was 11.24 cm (1.907).

❖ **LOWER MIDDLE CLASS (LM)**

Out of the 76 children studied 27 children belonged to LM status.

The mean weight (SD) of the children was 6.66 kg (1.606). The mean height (SD) of the children was 72.13 cm (8.105). The head-circumference (SD) of the children was 42.13 cm (2.026). The mean MUAC (SD) of the children was 12.26 cm (1.386).

❖ **UPPER LOWER CLASS (UL)**

Out of the 76 children studied 19 children belonged to UL status.

The mean weight (SD) of the children was 6.98 kg (1.003). The mean height (SD) of the children was 75.20 cm (6.325). The head-circumference (SD) of the children was 42.94cm (1.967). The mean MUAC (SD) of the children was 11.78 cm (0.846).

❖ **UPPER MIDDLE CLASS (UM)**

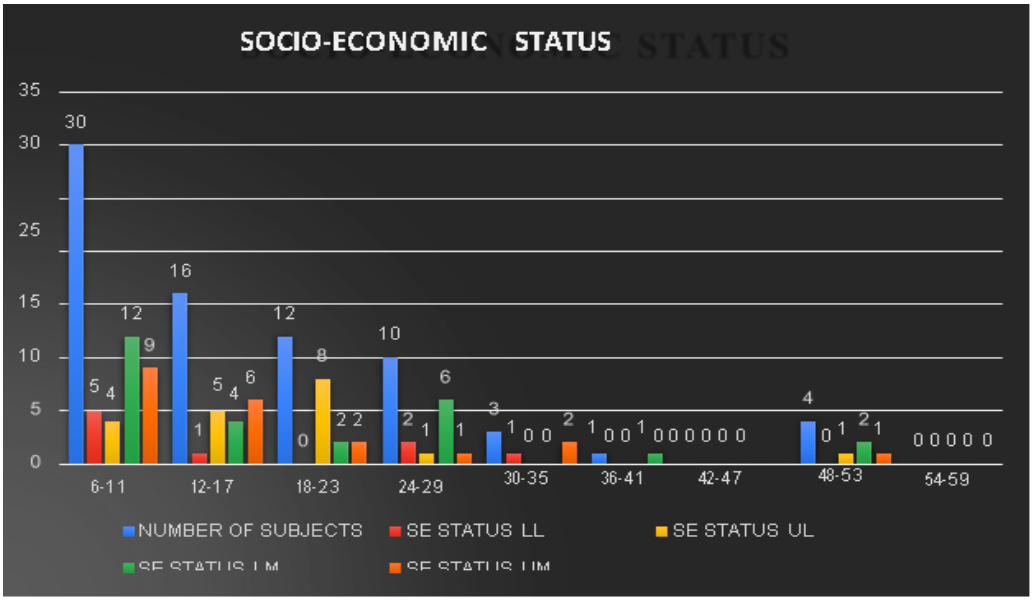
Out of the 76 children studied 21 children belonged to UM status.

The mean weight (SD) of the children was 6.80 kg (2.182). The mean height (SD) of the

children was 72.19 cm (9.643). The head-circumference (SD) of the children was 42.24 cm (1.506). The mean MUAC (SD) of the children was 12.31 cm (1.323).

Table 5: Results Based On Socioeconomic Status.

AGE (In Months)	NUMBER OF SUBJECTS (In Numbers)		SOCIO-ECONOMIC STATUS		
		LL	UL	LM	UM
6-11	30	5	4	12	9
12-17	16	1	5	4	6
18-23	12	0	8	2	2
24-29	10	2	1	6	1
30-35	3	1	0	0	2
36-41	1	0	0	1	0
42-47	0	0	0	0	0
48-53	4	0	1	2	1
54-59	0	0	0	0	0
TOTAL	76	9	19	27	21



Graph 3: Results Based On Socioeconomic Status.

➢ **NUTRITIONAL STATUS**

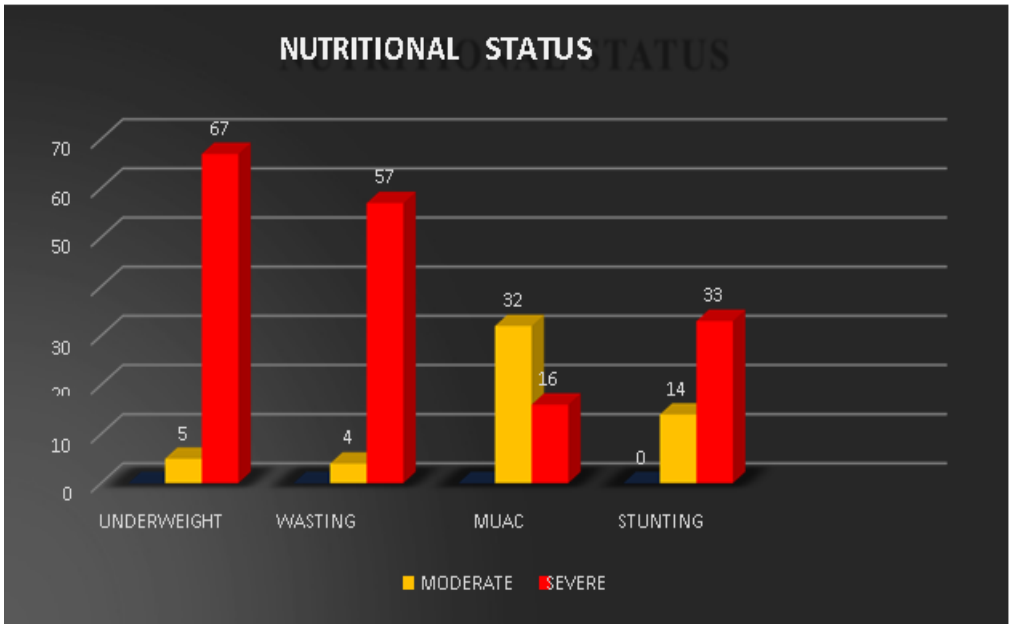
This study is unique in providing information about under nutrition and its determinants at the community level. The main factors analyzed in the study were underweight, wasting, mid-upper arm circumference and stunting based on which the malnutrition status was categorized as healthy, moderate Acute Malnutrition and severe acute malnutrition (SAM).

Based on underweight (weight-for-age) criteria, 6.5 per cent of the 76 children tested were suffering from MAM and 88.1 per cent of the children were suffering from SAM. Around 5.2

per cent of children suffer from MAM and 75 per cent of children suffer from SAM according to the prevalence of wasting (based on weight for length/height) criteria (SAM). Roughly 42.1 per cent of children were found to have MAM and around 21.05 per cent of children were found to have SAM when the mid-upper arm circumference (MUAC) was taken into account (SAM). When stunting was taken into account (based on length/height for age), it was discovered that 18.4 per cent of children had MAM and 43.4 per cent of children had SAM. The others who were left out were deemed to be in good health. The P-value was found to be <0.001.

Table 6: Nutritional Status.

CLASSIFICATION	INDEX USED	MODERATE	SEVERE
UNDERWEIGHT	WEIGHT-FOR-AGE	5 (6.5%)	67(88.1%)
WASTING	WEIGHT FOR LENGTH/HEIGHT	4 (5.2%)	57 (75%)
MID UPPER ARM CIRCUMFERENCE	6-59 MONTHS	32 (42.1%)	16 (21.05%)
STUNTING	LENGTH/ HEIGHT FOR AGE	14 (18.4%)	33 (43.4%)



Graph 4: Nutritional Status.

7. DISCUSSION

Available evidences show that MUAC is the best (i.e. in terms of age independence, precision, accuracy, sensitivity and specificity) case–detection method for severe and moderate malnutrition and that it is also simple, cheap and acceptable.[21]

Consistently high case of fatality rates in hospitalized Kenyan children of all ages between 12-59 months with low MUAC values, (≤ 11.5cm.) has been reported; this result[22] suggested that unadjusted (i.e. by age) MUAC may be useful in clinical settings. Velzeboer and others[23], reported in a comparison of W/H and MUAC in Guatemala, that, younger children tended to become upset and agitated during both height and weight measurements and that no such behavior was observed during the measurement of MUAC.

They also opined that, this measurement can be taken by minimally trained health workers. Therefore measurement of MUAC is a quick and reliable method for screening children to identify those who are seriously malnourished.[24] The prevalence of undernutrition in the present study clearly showed 8.5% children were found with MUAC less than 11.5cm. Children in the age group 25-36 months showed higher prevalence and then followed 37- 48, 48-60, 13-24 and 6-12 months age groups.

Most studies on Severe Acute Malnutrition (SAM) have focused on children under the age of five years. However, as shown Grima et al.[25], a great proportion of children above the age of 5 were admitted with SAM. Overall, oedematous malnutrition affected around 60% of the children. Additionally, among children under the age of five years a positive relationship was found between age and edema, whereas in the older children this relationship was reversed.[26]

8. CONCLUSION

Studies have shown that malnutrition is still a serious health problem for children age 6 months to 59 months. In urban areas and rural areas, nutritional deficiencies in the form of underweight and stunted growth are more common than food hunger. Factors such as the baby's gender, locality of residence, family socioeconomic status etc will affect the child's nutritional status. In the near future, we need to develop strategies for children's nutritional status to improve the growth index of the community. Strategies also need to be carved out to elevate the socio-economic status of the community.

LIMITATIONS

- Vaccination status was not wise because the immunization position is based on the immunisation scorecard, children who tally conventional convinced vaccines but hold destroyed the immunization roster present be misclassified.
- We do not work out nutrition viewing for children of age under 5 years.

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Conflict of interest

The authors declare that there is no conflict of interest.

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