

# COMMUNITY BASED RESEARCH ON MALNUTRITION IN CHILDREN OF URBAN SLUM

Bharatbhai, S.P

*113, Mahavirdham Vibhag -2, Near Madhavbaug School, New Kosad road, Amroli, Surat (Gujarat) India.*

---

## Abstract

The WHO Global Database on Child Growth and Malnutrition seeks to contribute to the transformation of this cycle of poverty, malnutrition and disease into a virtuous one of wealth, growth and health. Anganwadi center in urban slum area which is attached to Surat based Anganwadi Training center was selected for study. 91 children (0-6 years) of urban slum registered in an anganwadi Centre in Udhna. Cross sectional study was conducted. Out of 91 children, 41(45%) children were normal. 32% were moderately underweight and 23% children were severely under weight. Malnutrition as well as severe malnutrition is high among children who most irregularly participating at AWC activities. In this study indices used are Wt/Age to detect underweight children, Wt/Ht and MUAC to detect wasting. Comparative analysis of these indices indicates that under weight children are more that wasted children. 75% of SAM children are in SUW. The SMC health dept. with its unique infrastructure, AWC network and initiatives like Urban IMNCI, with quality screening for malnutrition and supportive supervision can reduce malnutrition rate as well as rate of SAM responsible for child mortality.

Keywords: Anganwadi, nutritional assessment, anthropometric indices

---

## INTRODUCTION

The WHO Global Database on Child Growth and Malnutrition seeks to contribute to the transformation of this cycle of poverty, malnutrition and disease into a virtuous one of wealth, growth and health.

Malnutrition usually refers to a number of diseases, each with a specific cause related to one or more nutrients, for example protein, iodine, vitamin A or iron. In the present context malnutrition is synonymous with protein-energy malnutrition, which signifies an imbalance between the supply of protein and energy and the body's demand for them to ensure optimal growth and function. This imbalance includes both inadequate and excessive energy intake; the former leading to malnutrition in the form of wasting, stunting and underweight, and the latter resulting in overweight and obesity.

## OBJECTIVES

- To assess magnitude of Malnutrition in Urban Slum.
- To study magnitude of malnutrition in different age groups and among boys and girls of urban slums
- To compare different anthropometric indices

## METHOD

### Study area

Aaganwadi center in urban slum area which is attached to Surat based Aaganwadi Training center was selected for study.

### Sample Size

91 children (0-6 years) of urban slum registered in an anganwadi centre in Udhna.

---

Corresponding Author Email: E-mail: drsurati@gmail.com

**Inclusion criteria**

- All children present at Anganwadi.
- Children of the families registered by AWW.

**Exclusion criteria:**

- People not giving consent for the study.
- All closed houses.

**Study design**

Cross sectional study

**Expected outcome**

Magnitude of childhood malnutrition assessed.

I want to learn about malnutrition assessment and different tools to assess the same in community based study.

**ANALYSIS**

**Profile of children studied**

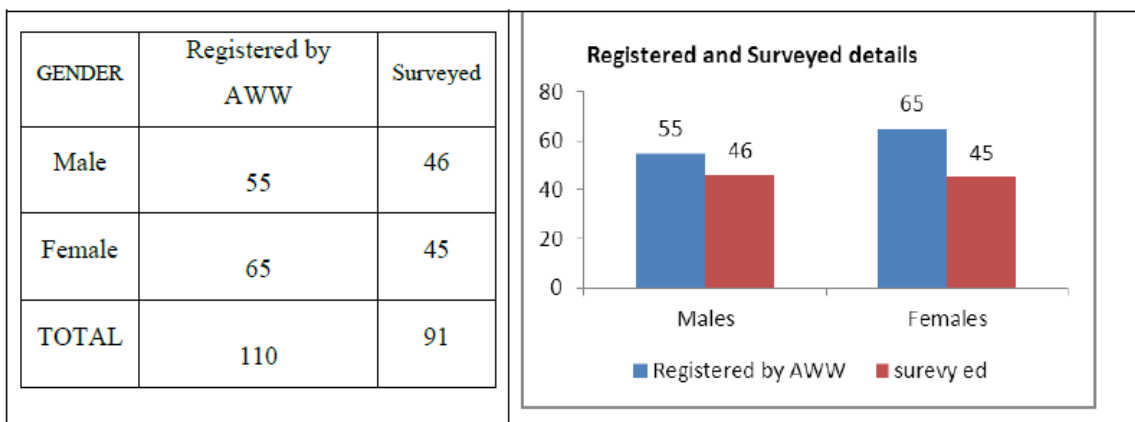


Figure 1: Registered and surveyed MALE / FEMALE children

In aanganwadi center the total no. of children registered were 110 out of which 55 were male and 65 were female. Total number of children covered under survey is 91 including 46 male and 45 female.

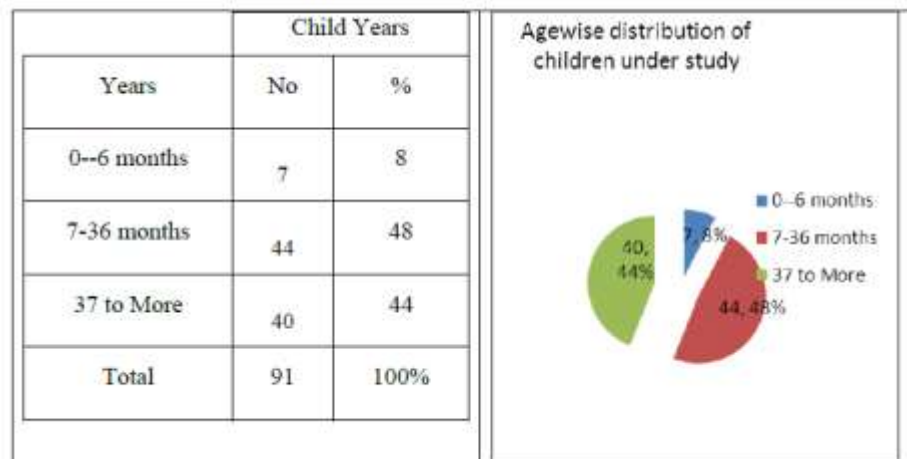


Figure 2: Distribution of children under study as per age

As per age wise distribution of children 7 (8%) were in < 6 months age group, 44 (48%) in 7 to 36 months age group and 40 (44%) were in 3-6 yrs age group. Majority of children were in age of 7 to 36 months age group.

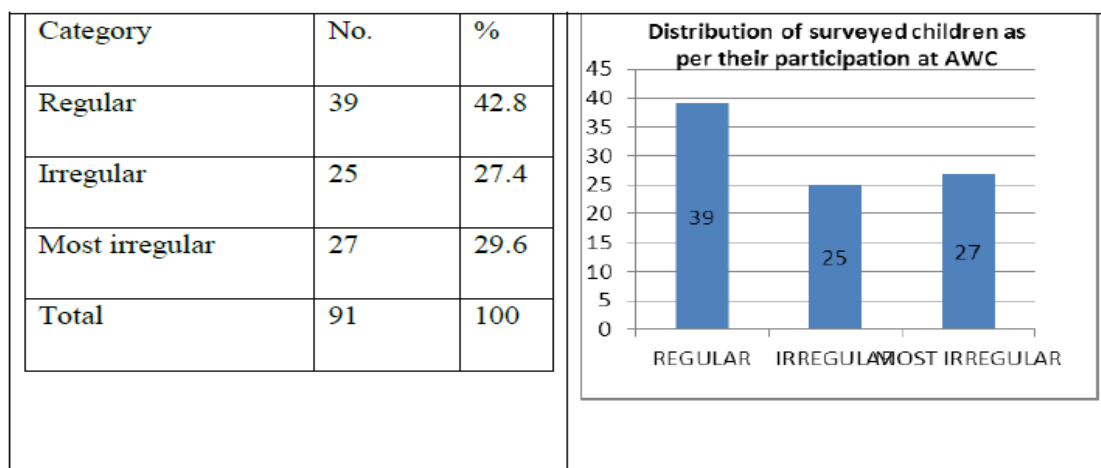


Figure 3: Distribution of surveyed children as per their participation at AWC

As per regularity of participation of children in ICDS activity they were grouped into three categories: regular, irregular, and most irregular. This was based on the feedback given by AWW.

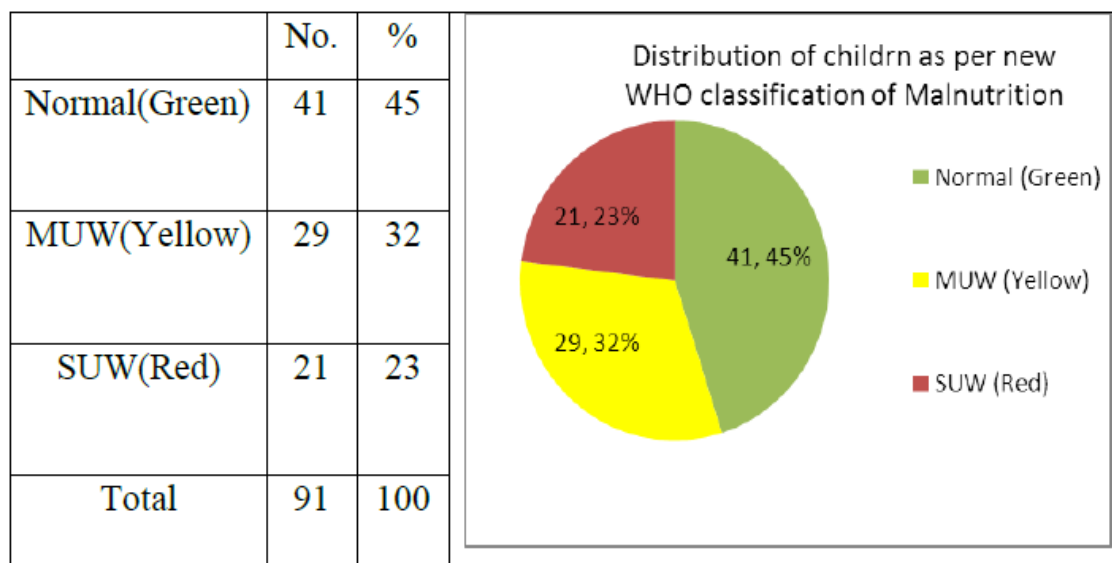


Figure 4: Distribution of children as per new WHO classification of Malnutrition

Children participating regularly were 39(42.8%), irregular were 25(27.4) and, most irregular 27 (29.6%).

**Malnutrition**

*Distribution of children as per Wt/Age (New WHO classification)*

Out of 91 children screened as per weight/ age new WHO classification 41(45%) were normal, 29 (32%) were MUW (Moderately underweight), and 21 (23%)

were SUW (Severely Underweight). Thus overall malnutrition prevalence rate (Underweight children rate) among children under study was 55%.

As per NFHS 3 childhood malnutrition rate in children of Gujarat state is 43% and the same for urban poor is 60%. Present study malnutrition rate among children of urban poor area is almost same.

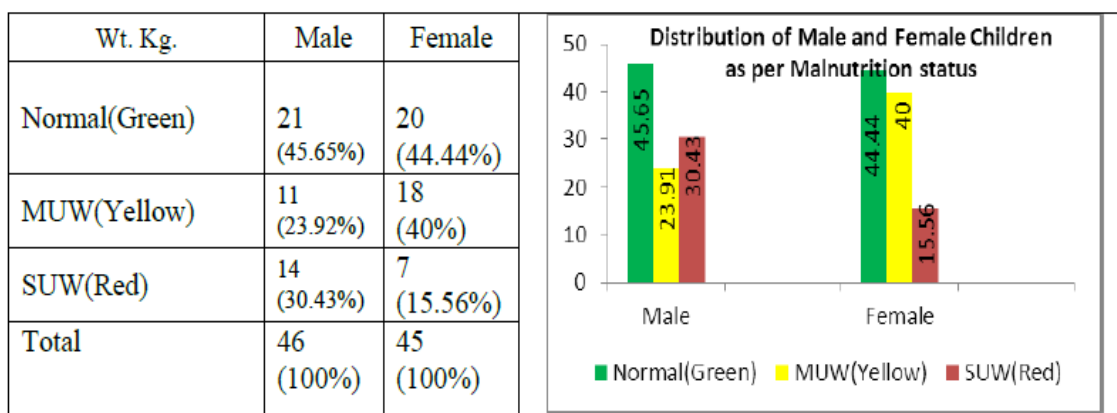


Figure 5: Distribution of Male and Female Children as per Malnutrition status (Wt/Age)

Out of 91 children studied, 45.65 % boys were normal and 44.44% girls were normal. 54.4% boys were under weight and 55.6% girls were underweight.

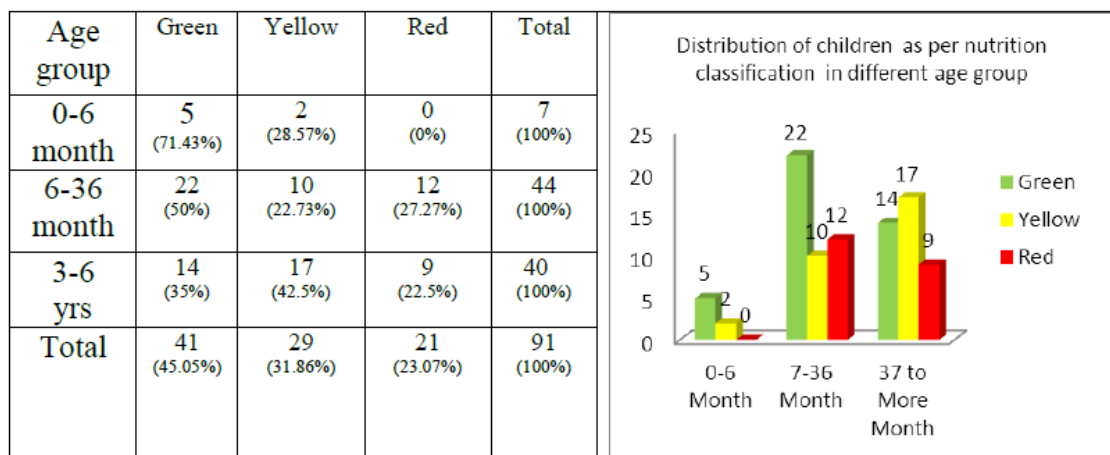


Figure 6: Underweight children (Malnutrition) as per age group (WT. /Age)

In 0-6 months age group 5(71.43%) children were normal , 2 (28.57%) children were moderately underweight (MUW) and none of the child was severely underweight (SUW).

In 6 to 36 months age group 22 (50%) children were normal, 10 (22.73%) were MUW and 12(27.27%) were SUW.

In 3 to 6 year age group 14(35%) children were normal,17 (42.5%)were MUWht and 9(22.5%) children were SUW .

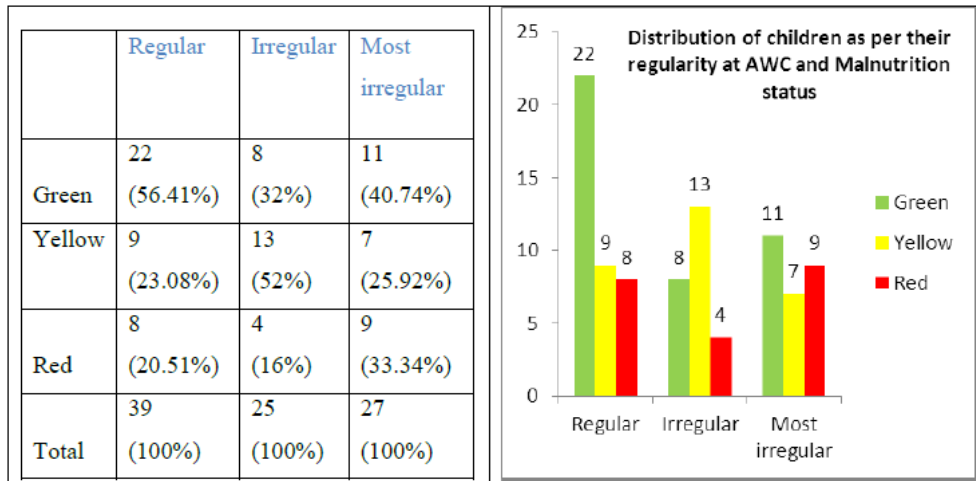


Figure 7: Distribution of children as per their regularity at AWC and Malnutrition status

Normal children among children regularly attending AWC were 22(56.41%) and among irregular were 8(32%) and most irregular were 11(40.74%).

Rate of Underweight children (malnutrition) among children regularly attending AWC was 43.6% and among irregular was 68% and most irregular was

59.3%. SUW children among regularly attending AWC were 8(20.51%) and among most irregular was 9(33.34%). Rate of Underweight and severely underweight children were lowest among children regularly attending AWC.

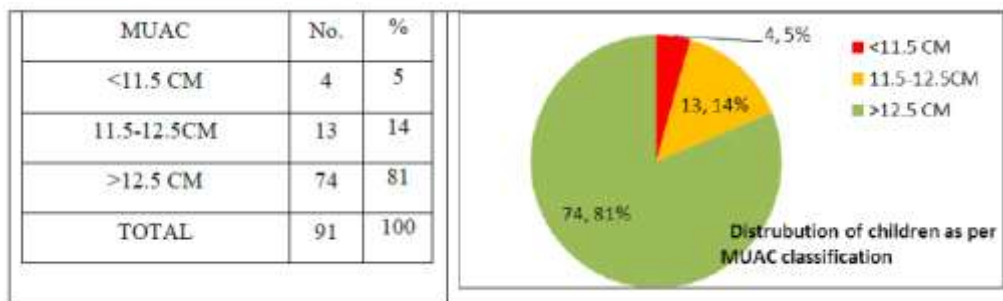


Figure 8: Distribution of children as per MUAC classification

Mid Upper Arm Circumference (MUAC) is an age independent index used for assessment of malnutrition specially wasting. For community based assessment of SAM among children MUAC is recommended. MUAC is used to screen severely acute malnutrition (SAM) <11.5cm and moderate acute malnutrition 11.5-12.5cm. (MAM)

All children were screened for MUAC. As per MUAC 81% (74) were normal and 19% were wasted. Among children with wasting majority 14% (13) had moderate wasting (MAM) and 5% (4) had severe wasting (SAM)

**Bilateral pitting edema:**

No child was suffering from bilateral pitting edema on legs.

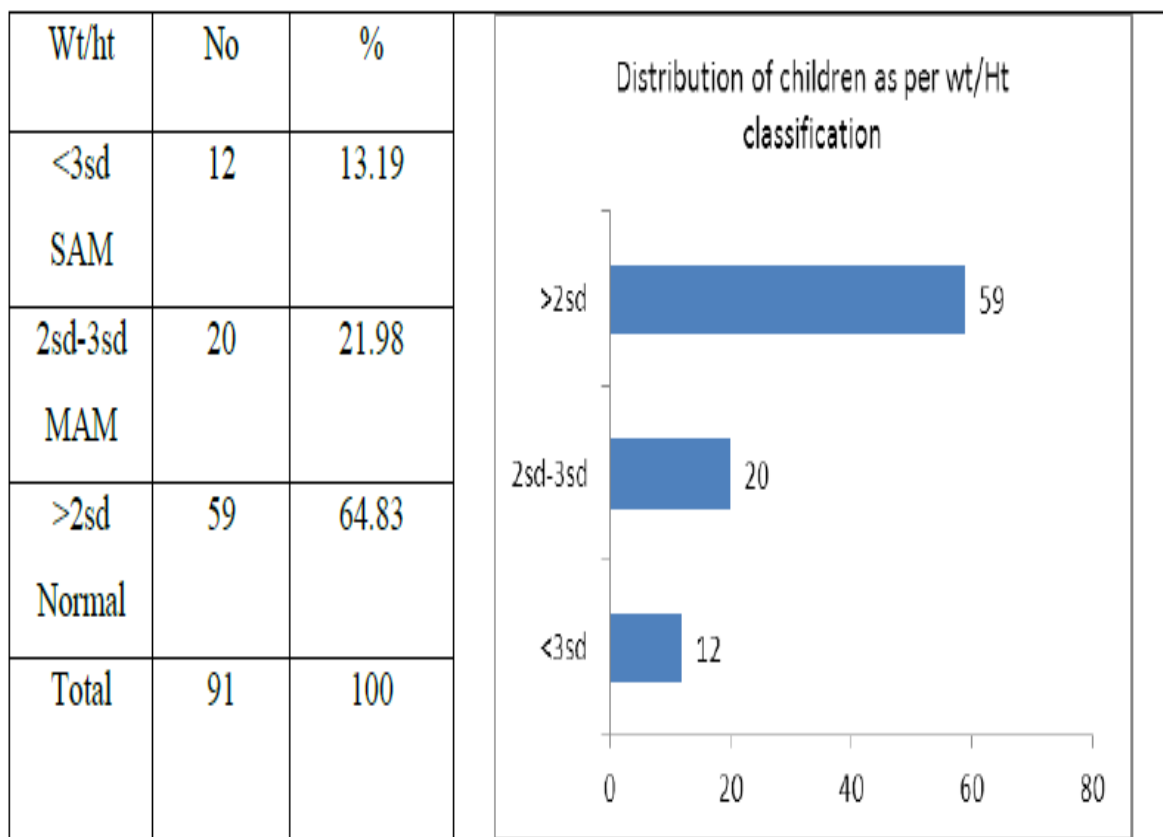


Figure 9: Distribution of children as per Wt/Ht

For screening of children with wasting Wt/Ht is considered as Gold standard. Wt/Ht value of child as per age is compared with WHO reference standard and Children under <3Sd are classified under SAM (Severe acute malnutrition, 3 Sd to 2Sd classified under MAM (Moderate acute malnutrition) and those in >2SD are classified under normal group.

When children under study were screened for wasting as per Wt/Ht standards 64.8% (59) were normal, 21.9% (20) were MAM and 13.2% (12) were SAM.

### Morbidity

Table 1: Diarrhoea

	Total	Yes	%
Male	46	6	13
Female	45	7	15
TOTAL	91	13	14.3

History of diarrhoea in last fifteen days was present in 13 (14.3%) children Prevalence rate of diarrhea was 13.% in boys and 15.% in girls .

Table 2: Fever

	Yes	%	Total
Males	7	15.2	46
Females	3	6.6	45
TOTAL	10	9.1	91

History of fever in last fifteen days was present in 10(9.1%) children. prevalence rate of fever was 15.2% in boys and 6.6% in girls

### Measles

There was no child with H/O measles in Last two months

### Comparison of indices in use for Malnutrition screening

Table 3: Wt/Age (Under weight) and Wt/Ht (Wasting)

Wt/Ht	Wt/Age			
	Green	Yellow	Red	Total
<3SD	1	2	9	12
2Sd-3SD	8	9	3	20
>2SD	32	18	9	59
Total	41	29	21	91

There were 21 children in SUW (red classification) and 12 children in SAM (<3Sd). Amongst 12 SAM children 9 are common SUW as well as SAM. This indicates that 75% of total SAM children are in SUW group.

Table 4

MUAC	Wt/Age			
	Green	Yellow	Red	Total
SAM (<11.5cm)	0	1	3	4
MAM (11.5-12.5cm)	4	4	5	13
Normal (>12.5cm)	37	24	13	74
Total	41	29	21	91

Detection of SAM children and their management is a step towards reduction of child mortality due to malnutrition. This study reveals that if underweight screening which is a routine under ICDS as well as MAMTA divas screening, which is easiest of all other anthropometric measurements, if properly done can detect 75% of SAM children.

#### ***MUAC and Wt/Age – under weight***

There were 21 children in SUW (red classification) and 4 children in SAM (<11.5cm MUAC). Amongst 4 SAM children 3 are common SUW as well as SAM. This indicates that 75% of total SAM children as per MUAC are in SUW group.

MUAC is recommended for screening of acute malnutrition under field conditions by paramedics. This study reveals that if underweight screening which is a routine under ICDS as well as MAMTA divas screening, which is easiest of all other anthropometric measurements, if properly done can detect 75% of SAM children, otherwise would have detected by MUAC.



Table 5: Wt/Ht and MUAC

MUAC	Wt/Ht			Total
	SAM	MAM	Normal	
	<3sd	2-3Sd	>2SD	
SAM			1	
<11.5cm	3	0		4
MAM		6		13
11.5-12.5cm	2		5	
Normal	7			
>12.5cm		14	53	74
Total	12	20	59	91

There were 12 children in SAM as per Wt/Ht and 4 children in SAM as per MUAC. Amongst 12

SAM children detected by Wt/Ht, 3 are common as per MUAC also. 2

Children detected as SAM as per Wt/Ht falls in to MAM as per MUAC, while 7 children detected as SAM as per Wt/Ht falls in to normal group as per MUAC.

This indicates that if Wt/Ht is considered a Gold standard for SAM detection only one fourth of them are selected by MUAC. Comparison of all three indices Wt/Age, Wt/Ht and MUAC favors simple and in routine practice Wt/age screening which detects 75% of SAM children detected by Wt/Ht as well as MUAC.

## RESULT

Out of 91 children, 41(45%) children were normal. 32% were moderately underweight and 23% children were severely under weight. No child was suffering from bilateral pitting edema.14.3% children had history of diarrhea in last 15 days, 9.1% children had history of fever in last 15 days and there

was no child with the history of Measles in last two months.

Malnutrition as well as severe malnutrition is high among children who most irregularly participating at AWC activities. Measurement of Weight, height and Mid upper arm circumference was done for anthropometric measurement to assess malnutrition in children. Anthropometric measurements are converted in to indices to assess different types of malnutrition.

In this study indices used are Wt/Age to detect underweight children, Wt/Ht and MUAC to detect wasting. Amongst these three indices MUAC is age independent. Comparative analysis of these indices indicates that under weight children are more that wasted children. 75% of SAM children are in SUW.

## RECOMMENDATION

The SMC health dept. with its unique infrastructure, AWC network and initiatives like Urban IMNCI, with quality screening for malnutrition and supportive supervision can reduce malnutrition rate as well as rate of SAM responsible for child mortality.

Proper micro-planning and special efforts to improve rate of children regularly participating in AWC activity shall also result in reduction of malnutrition.

In Surat city AWWs are trained in IMNCI but it was observed during survey at AWC that it is not practiced universally. Proper sustained implementation of IMNCI can further support efforts of reduction of malnutrition rate as well as mortality of children.

ICDS activity should be supervised regularly to reduce the rate of malnutrition and severe acute malnutrition. Inter personal communication should be done between aanganwadi workers to mother.

### **ACKNOWLEDGMENT**

I extend my sincere gratitude to Professor Dr. Dileep Mavalankar, Director Indian Institute of Public Health, Gandhinagar (IIPH-G), who has been my mentor for the research program & has been instrumental in helping me shape this study in a desirable way. Great thanking to him for giving me the opportunity to do this internship I thank him for all the trust and faith he posed in me and I only hope that I have been able to live up to his expectations.

I extend my sincere gratitude to Professor Dr. Vikas Desai, Technical Director, and UHCRC, who has been my mentor for internship program & has been instrumental in helping me shape this study in a desirable way. I express my sincere thanks to her for proving me valuable guidance. Her guidance and support is helped me lot during research time. I extend sincere gratitude towards Dr. Deepak Saxena, Assistant Professor Indian Institute of Public Health, Gandhinagar (IIPH-G) for his support and guidance.

I must appreciate the sincere efforts done by my parents and my friend, who acted as a friend, philosopher and guide throughout my study, whose dream came true. I feel great pleasure to accept life time debt to all those known and unknown persons

and my well-wisher for their extensive health irrespective of the quantity and quality during my study period and made this project fruitful and a great success.

### **REFERENCES**

Assessing the impact of the introduction of the World Health Organization growth standards and weight-for-height z-score criterion on the response to treatment of severe acute malnutrition in children: secondary data analysis. *Pediatrics* 123: e54–59 [PMC free article] [PubMed]

Climate Change and Children's Health—A Call for Research on What Works to Protect Children Zhiwei Xu,1 Perry E. Sheffield,2 Wenbiao Hu,3 Hong Su, 4Weiwei Yu, 1Xinqi and Shilu Tong1,\*

G, Ouannes M, Shepherd S. Source Médecins Sans Frontières, Paris, France.

Mid-Upper Arm Circumference Based Nutrition Programming: Evidence for a New Approach in Regions with High Burden of Acute Malnutrition Sylvie Goossens, 1Yodit Bekele,1 Oliver Yun,2 Géza Harczy,1 Marie Ouannes, 1 and Susan Shepherd2,\*

Mid-upper arm circumference based nutrition programming: evidence for a new approach in regions with high burden of acute malnutrition. Goossens S, Bekele Y, Yun O, Harczy

Nutritional status of children: validity of mid-upper arm circumference for screening under nutrition. Kumar R, Aggarwal AK, Iyengar SD. Department of Community Medicine, Postgraduate Institute of Medical Education and Research, Chandigarh.

Park K., Park's Textbook of Preventive and Social Medicine, 19th edition. Management of severe acute malnutrition in children

Reliability of the Mid Upper Arm Circumference for the Assessment of Wasting among Children Aged 12-59 Months in Urban Ibadan, Nigeria. Dairo MD, Fatokun ME, Kuti M. Department of Epidemiology and Medical Statistics University of Ibadan, Nigeria

Research on ICDS: An Overview (1986-1995) vol: 2 National Institute of Public Cooperation and Child Development New Delhi

The Lancet, Volume 368, Issue 9551, Pages 1992-2000 Steve Collins, Nicky Dent, Paul Binns, Paluku Bahwere, Kate Sadler

WHO/UNICEF/WFP/SCN Joint Statement (2007) Community-based Management of severe acute malnutrition [http://www.who.int/child\\_adolescent\\_health/documents/pdfs/severe\\_acute\\_malnutrition\\_en.pdf](http://www.who.int/child_adolescent_health/documents/pdfs/severe_acute_malnutrition_en.pdf)

**APPENDIX**

Annexure During research

- Register for survey

NUTRITIONAL PROFILE OF CHILDREN UNDER URBAN ICDS PROGRAM {SURAT}														
AWC NO 158 RATAN CHOWK -2, UDHNA YARD , SURAT URBAN -3														
s r n o .	N a m e	Birth day	Age in month	M / F	ht	Measurment						Swelling oedema	H/O in Last two months	
						W T	w t / a g e	w t / h t	h t / a g e	Who chart green/ yellow/ red	M U A C		y e s / n o	measles

- Tool during survey :

Tool during survey :

- Mid upper arm circumference tape:
- Weight scale and height tape:

**FOOTNOTES**

<sup>1</sup> Each fo  
ask authors

<sup>2</sup> As of 20  
footnotes in

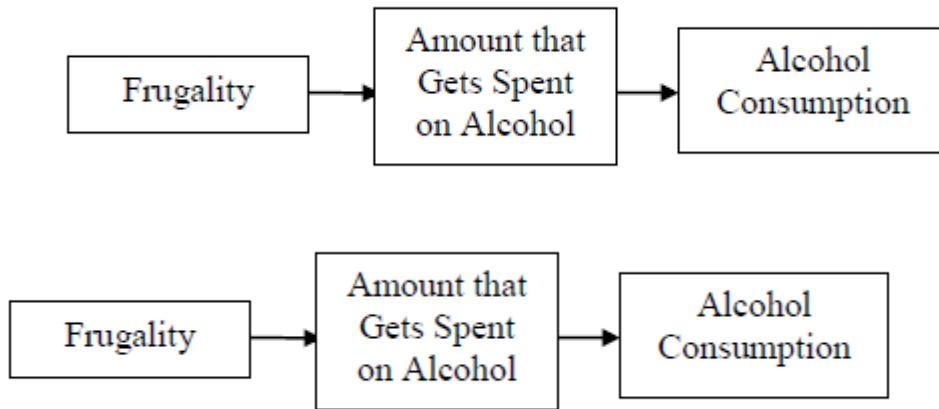


Figure 1. This simple path model, adapted from results in a *Journal of Consumer Behaviour* paper, is an example of a figure.