## Original Research Article

# Nutritional status of under five children attending Anganwadi in rural area of central India

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**ABSTRACT**

**Background:** Under five mortality rate (U5MR) of India is 36. Malnutrition is most important factor contributing to under five mortality.
**Methods:** 354 children in the age group 0-5 years were included in the study. Weight, height and Mid Upper arm circumference was measured. Data was analyzed by using 'Anthro' software. Z scores were calculated. Prevalence of stunting, wasting and underweight was calculated.
**Results:** Prevalence of stunting, wasting and underweight is 35%, 6.4% and 15.8% respectively.
**Conclusions:** Malnutrition is statistically associated with socioeconomic status, maternal literacy and exclusive breast feeding.

**Keywords:** Anganwadi, Malnutrition, Stunting, Underweight, Under five, Wasting

## INTRODUCTION

According to National Family Health Survey (NFHS-IV) conducted in 2014-15, prevalence of underweight, stunting and wasting in India is 35.8%, 38.4% and 21% respectively.[1] Current under five mortality rate of India is 36.[2] Most of the deaths in under five is due to malnutrition. Stunting is more prevalent than underweight and wasting. Stunting indicates chronic malnutrition.

Integrated Child Development Scheme (ICDS) is functional in the country since 1975. Under ICDS supplementary food is given to the children 6 months to 6 years age group. Children are the future assets of the country. Hence it is the responsibility of every state to look after health of these children. This study is conducted to find out prevalence of stunting, wasting and underweight among under five children.

Objectives of the study was to determine the prevalence of stunting, wasting, severe wasting and underweight among 0 to 5 years children attending anganwadi centre and to find out factors associated with stunting, wasting and underweight.

## METHODS

The cross sectional (descriptive) study was conducted for 3 months (from March to May 2019) in one of the Integrated Child Development Scheme (ICDS) project area of rural India

100 anganwadis are usually present in one ICDS project. 10 Anganwadi centres were selected by random sampling method from 100 AWCs. 354 Anganwadi children between age group 0-6 years were registered in these anganwadi centres (AWC). Permission was taken from child development project officer (CDPO) of the ICDS

project block. Permission was also obtained from institutional ethics committee. Informed consent was obtained from parents. Strict confidentiality was maintained regarding data.

### Sample size calculation

Prevalence of underweight among under five in Maharashtra state according to NFHS-IV survey is 36%.[3] Hence,

$N= (Z_\alpha)^2 \, pq/d^2$ , so sample was taken as 354.
Where $Z_\alpha$=1.96 (for 5% level of significance)
 p= prevalence of malnutrition q=1-p
d=absolute precision taken as 5%

Children between 0-5 years were included in the study and children between 5-6 years were excluded from the study. Total 354 children were included in the study.

Socio-demographic details of the children like name, age and sex was collected from Anganwadi worker. Each AWC was visited. Weight of the each child was recorded by using Salter's scale. Salter scale was hanged properly. Standing height of children between age group 2-5 years was measured by using measuring tape. The recumbent height was measured by using infantometer for the age less than 1 year. Mid upper arm circumference was measured by using Shakir's tricolour tape. The MUAC measured by taking midpoint between olecranon and acromion process. Midpoint was plot in between them. Shakir was wrapped around midpoint and measurement was taken. The collected data was organized in excel sheet and converted to csv file. The data was analyzed by using 'Anthro' software provided by World Health Organization.

### Definitions

*Stunting:* Height for age <-2SD (standard deviation) of WHO child growth standards median

*Wasting:* Weight for height <-2SD of WHO child growth standards median

*Severe wasting:* Weight for height <-3SD of WHO child growth standards median

*Underweight:* Weight for age <-2SD of WHO child growth standards median

### Statistical analysis

Statistical analysis was done by using R software version 3.6.1

## RESULTS

Mean age of children is 31.45 months with standard deviation of 14.34 months. Mean weight of children is 11.14 kg with standard deviation of 2.18 kg. Mean height of children is 79.99 cm with standard deviation of 12.22 cm. Mean mid-upper arm circumference (MUAC) is 14.28 cm with standard deviation of 1.19 cm.

Prevalence of stunting, wasting and underweight is 35%, 6.4% and 15.8% respectively among children attending anganwadi centre in age group 0-5 years (Table 1).

**Table 1: Prevalence of stunting, wasting and underweight among under five children attending anganwadi (n=354).**

| Age group | Stunting (%) | | | Wasting (%) | | | Under weight (%) | | |
|---|---|---|---|---|---|---|---|---|---|
| Sex | M | F | T | M | F | T | M | F | T |
| 0-5 m | 33.3 | 0 | 20.0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6-11 m | 25.0 | 23.5 | 24.3 | 0 | 0 | 0 | 0 | 16.7 | 6.7 |
| 12-23 m | 35.5 | 35.7 | 35.6 | 9.1 | 0 | 4.8 | 20 | 0 | 12 |
| 24-35 m | 40.5 | 35.9 | 33.3 | 0 | 13.3 | 6.5 | 5.6 | 26.7 | 15.2 |
| 36-47 m | 42.6 | 31.1 | 38.1 | 8.3 | 6.7 | 7.7 | 12.5 | 20 | 15.4 |
| 48-59 m | 38.2 | 24.0 | 32.2 | 0 | 22.2 | 9.5 | 8.3 | 55 | 28.6 |
| Total | 38.4 | 30.8 | 35.0 | 4.3 | 9.1 | 6.4 | 23.6 | 10.1 | 15.8 |

M: Male F: Female T: Total

**Table 2: Association between stunting, wasting and underweight with various variables (n=354).**

| Variable | | Stunting | Normal | Chi-square test[2] | P |
|---|---|---|---|---|---|
| Socioeconomic status | APL | 85 | 173 | 1.81 | 0.178 |
| | BPL | 39 | 57 | | |
| Maternal education | Illiterate | 48 | 61 | 5.62 | 0.017 |
| | Literate | 76 | 169 | | |
| EBF | Yes | 43 | 133 | 17.27 | 0 |
| | No | 81 | 97 | | |

Continued.

| Variable | | Stunting | Normal | Chi-square test[2] | P |
|---|---|---|---|---|---|
| **Working mother** | Yes | 37 | 78 | 0.61 | 0.435 |
| | No | 87 | 152 | | |
| | | **Wasting** | **Normal** | **Chi-square test[2]** | **P** |
| **Socioeconomic status** | APL | 10 | 248 | 10.76 | 0.001 |
| | BPL | 13 | 83 | | |
| **Maternal education** | Illiterate | 16 | 93 | 17.35 | 0 |
| | Literate | 7 | 238 | | |
| **EBF** | Yes | 8 | 168 | 2.19 | 0.138 |
| | No | 15 | 163 | | |
| **Working mother** | Yes | 6 | 109 | 0.46 | 0.498 |
| | No | 17 | 222 | | |
| | | **Underweight** | **Normal** | **Chi-square test[2]** | **P** |
| **Socioeconomic status** | APL | 32 | 226 | 8.34 | 0.003 |
| | BPL | 24 | 72 | | |
| **Maternal Education** | Illiterate | 19 | 90 | 0.31 | 0.579 |
| | Literate | 37 | 208 | | |
| **EBF** | Yes | 20 | 156 | 5.22 | 0.022 |
| | No | 36 | 142 | | |
| **Working mother** | Yes | 17 | 98 | 0.14 | 0.711 |
| | No | 39 | 200 | | |

p value<0.05 is considered as statistically significant, df=1 (degree of freedom); EBF: Exclusive breast-feeding APL: Above poverty line BPL: Below Poverty line.

Stunting is significantly associated with maternal education and exclusive breast feeding. There is statistically significant association between wasting and socio-economic status as well as maternal literacy. Underweight is statistically significantly associated with socioeconomic status and exclusive breast feeding (Table 2).

## DISCUSSION

The study was conducted in rural area of central India. Total numbers of anganwadi children included were 354. Total 198 boys and 156 girls were included in the study (Figure 1). Prevalence of stunting, wasting and underweight was 35%, 6.4% and 15.8% respectively. Prevalence of severely wasted was 1.6% (Table 1). In a study conducted by Badake et al in Kenya prevalence of stunting is 39%, wasting 7.1, severely wasted 1.6%, underweight 18.1%, boys are more stunted and wasted than girls.[4] In our study, also boys are more stunted than girl. Olodu et al conducted study in Nigeria found that prevalence of stunting; wasting and underweight is 18.6%, 25.3, and 29.5%.[5] In a study conducted by Chataut et al in rural Nepal, 7% wasted, 39.9% stunted and 18.9% underweight.[6]

In a study conducted by the Alom et al in Bangladesh, 16% severely stunted, 25% moderately stunted, 3% severely wasted, 14% moderately wasted, 11% severely underweight and 28% moderately underweight. Maternal education and breast feeding practices strongly associated

with malnutrition.[7] Wondafrash et al conducted a study in Central Ethiopia, found that stunted, underweight and wasting 33.8%, 12.6% and 8.3% respectively and nutritional status of children whose mothers working is better than nonworking.[8] In a study conducted by the Safikul et al in Assam found that boys are more malnourished and prevalence of stunting, wasting and underweight is 30.4%,, 21.6% and 29% respectively.[9]
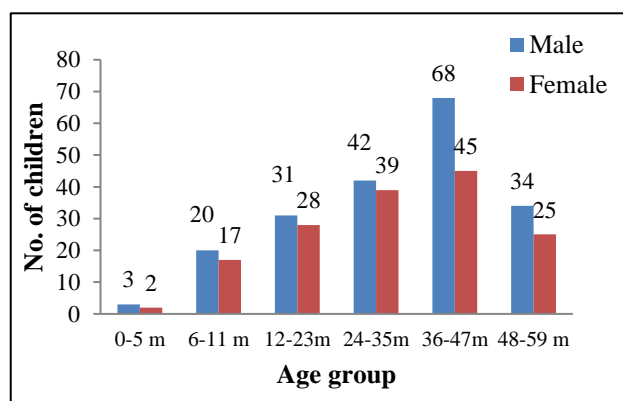


**Figure 1: Age and sex wise distribution of Anganwadi children.**

In a study conducted by Mamulwar et al in urban slum of Pune, found that boys were more wasted whereas stunting and underweight is more prevalent in girls. Prevalence of stunting, wasting and underweight is 58.7%, 16.9 and 34.3% respectively.[10] In a study by Osguei et al in Nepal found that stunting 46.3%, wasting 14.1% and

underweight 38.1%. Maternal education and standard of living was associated with malnutrition.[11]

Mohsena et al found that z scores were not significantly different in boys and girls and also multiple factors associated with malnutrition like maternal occupation and education and region etc.[12] In a study conducted by Ali et al in Pakistan found that prevalence of malnutrition is 26.7%. Girls are more malnourished than boys. Mother's employment status is associated with malnutrition.[13] Bhandari et al conducted a study in Kapilvastu, Nepal found that 66.66% children are malnourished. Mother's age, exclusive breast feeding, birth order and socioeconomic status are significant determinants of malnutrition.[14] Similarly, in our study maternal education, socioeconomic status and exclusive breast feeding are statistically associated with malnutrition (p-value<0.05).

## CONCLUSION

Stunting is more prevalent than wasting and underweight. Stunting and underweight is more common among boys than girls. Wasting is more common among girls. Maternal education, poor socioeconomic status and exclusive breast feeding are statistically significantly associated with malnutrition.

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