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Research Paper

Assessment of Nutritional Status of Children Below 5 Years Of An Anganwadi Center In Barasat, North 24 Parganas, West Bengal

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ABSTRACT
Assessing nutritional status is very important for screening and identifying individuals and populations that are affected by/at risk with malnutrition. Height, weight and MUAC are taken to understand the proper nutritional status of the studied children. 66 children are taken for this study from an Anganwadi Center in which 35 are boys and 31 are girls. 14.28% of boys and 3.22% girls are moderately stunted. 20% boys and 9.67% girls are moderately underweight. 8.57% boys and 9.68% girls are moderately wasted. To further understand the nutritional status of the studied children, socio demographic profiles like occupational status and income of their parents are also taken into account. Unpaired t test is also calculated of height, weight and MUAC. The value of nutritional status was calculated and categorized and observed the value of z-score provided the chart by WHO (2006).

Keywords: *Nutritional status, Assessment, Health, Height, Weight, MUAC.*

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I. INTRODUCTION

Health is defined by the World Health Organization (WHO) in 2006 as the "state of complete physical, mental and social well- being and not merely the absence of disease and infirmity".
The essential requisites (or dimensions) of 'health' include the following-

- Achievement of optimal growth and development, reflecting the full expression of one's genetic potential.
- Maintenance of the structural integrity and functional efficiency of body tissues necessary for n active and productive life.
- Mental health.
- Social well- being is the ability to live in harmony with others, and
- Ability to withstand the inevitable process of aging with minimal disability and functional impairment, and ability to combat disease such as
  - Resisting infections (immune competence).
  - Preventing the onset (and retarding the progress) of degenerative diseases such as cancer.

Nutrition is the science of foods, the nutrients and other substances therein, their action, interaction and balance in relationship to health and disease; the processes by which the organism ingests, digests , absorbs, transports and utilises nutrients and disposes the end product. In addition, nutrition is concerned with social, economic cultural and psychological implications of food and eating. Good nutrition is the foundation for good health. Food varies in their compositions and no one type of food contains all we need, in the amounts that we need. A meal lacking in a particular requirement of our body, for a prolonged period can result in disease, and even in death. Therefore, knowledge of the food requirements of our body and various sources of obtaining them is essential. Studies carried out in many countries show that a good diet has promoted proper growth in children and has improved the general health of the people.

Nutritional status is the condition of health of the individual as influenced by the utilisation of the nutrients. It can be determined only by the correlation of information obtained through a careful medical and dietary history, taking physical measurements of the body, clinical examination and appropriate laboratory investigation.

Assessment of nutritional status of community is one of the first steps in the formulation of any public health strategy to combat malnutrition. The principle aim of such an assessment is to determine the type, magnitude and distribution of malnutrition in different geographic areas, to identify 'at risk' groups to determine the contributory factors.

Growth retardation may be first response of the body towards nutritional deficiencies while appearance of clinical signs may be the final stage. From the public health point of view, identification of sub- clinical forms of malnutrition is very important for planning programmes of nutrition intervention so as to prevent such milder cases going into severe forms with consequent risk of high mortality. Anthropometric measurements i.e. body measurements are the most widely used means, to assess nutritional status. Use of anthropometric measurements depends on two factors:

- Accurate age assessment, especially in case of preschool age children.
- Appropriate instruments,
- Standardization of anthropometric techniques,
- Use of WHO Child Growth Standards (for <5 year)/reference values (for older age groups) and
- Appropriate classifications for grading nutritional status.

II. LITERATURE REVIEW

1. Ramachandran P. and Gopalan H. (2011) also studied in India and they explore the implication of differences in under nutrition rates in the 0 to 5 months of age group as assessed by height- for- age, weight- for- age and BMI for age.

2. Manjunath R. et al (2014) studied among Kadukuruba tribes in Mysore District. They studied among below 5 years children of the above tribe. Among 101 below 5 years children they found, prevalence of underweight, stunting and wasting was 60.4%, 55.4% and 43% respectively which was significantly associated with respect to age, presence of ration card in the family and egg in the child's diet. Significantly higher prevalence of under nutrition was noted among below 5 years children in this community.

3. Meena S. et al (2015) studied in the area Kolar in Madhya Pradesh. They found that with the new chart from WHO (World Health Organization) 51% of below 5 years children had varying degree of malnutrition. On the basis of clinical examination the prevalence of malnutrition was 49%.They also recorded that child age above one year, Mid Upper Arm Circumference (MUAC) is less than 13.5 cm. They also studied socio- demographic factors like mother's education, mother's age of marriage, family, mother's employment also affect the malnutrition.

4. Silva, V.G. Silva, S.G. (2015) studied in Anganwadi in Goa and found that the proportion of underweight children in the age group of 6 to 36 months was higher (38.1%) than the proportion of underweight children (24.9%) in the age group of 37 to 72 months, and they noticed that this difference was found to be statistically significant. The proportion of underweight children was found to be the highest in lower class, and lowest in upper class and a statistically significant association between socio-economic class and nutritional status was found.

5. Priyanka R. et al (2016) also studied in Kerala and found that prevalence of underweight among below 5 years children was 28.8% and stunting was 21.1%. They also provided information about NFHS3 that is 43% below 5 years children in India were underweight and 48% were stunted. They studied to access the nutritional status of below 5 years children and factors associated with under nutrition.

6. Roopadevi V. et al (2016) studied and they found 24.8% had under nutrition, 55% had stunting and 23.1% had wasting among 307 preschool children. They also found that no statistical significant difference between the gender for weight for age and height for age, however it was found statistical significant for weight for height.

7. Sarkar M. et al (2017) studied in Matigara Block in Darjeeling District in West Bengal to find out the nutritional status of the Anganwadi children of the block and socio-demographic profile of the parents. 5 centres

were randomly taken among 314 Anganwadi. Age between 1 to 6 years children were accessed for height, weight and MUAC. 215 children among age of 1 to 5 years were considered for the study. 10.23% children are moderately malnourished and 2.79% children are severally malnourished. They also found that education, occupation and income are responsible for malnourishment.

8. Gondikar A. et al (2017) also studied in urban slums of Miraj city, Maharastra and noticed that under nutrition was more prevalent in age group of 13 to 24 months. They also noticed that this malnutrition is found whose mothers are non-literate and has incomplete immunization.

9. Moluguri A. et al (2019) studied in rural and urban area of Karimnagar and recorded that 27.7% children were mildly malnourished, 16.5% were moderately malnourished 3.9% were severely malnourished and 0.9% was very severely malnourished among 846 children. They also noticed that 84% are immunized and rest of all are found incomplete.

10. Suhitha R. Das et al (2020) studied among children aged between 6 months to 6 years to understand the nutritional status of the children in Anganwadi. They also studied socio- demographic factors to associate with malnutrition to access their dietary intake.

III. AIM AND OBJECTIVE OF THE PRESENT STUDY

- To assess the nutritional status by using anthropometric indices of the studied population.
- To explain sex differences in respect of aforementioned parameters of the studied population.

◆ STUDIED AREA

The present study was conducted in Ahira Anganwadi Centre in the village Ahira of Ichhapur Nilganj, Barasat Block- I in North 24 Parganas district of West Bengal, PIN Code – 700121.

◆ DATA COLLECTION

In this present study, simple random sampling was used to select the studied children. Then a prepared schedule was used to collect the required data. Anthropometric measurements like height, weight and MUAC was taken. Socio-demographic profile like occupational status and income of the parents of those studied children was also collected.

◆ INCLUSION AND EXCLUSION CRITERIA

- The measurement of the children above the age of 5 years was not taken as well as in this present study only ICDS going children were included.
- In this present study physically and mentally challenged children were excluded.

◆ LIMITATIONS OF THE PRESENT STUDY

The study was conducted in a short period of time. The time of rapport establishment with the children's mothers was limited. Due to the small sample size the conclusion was not made in broader aspect.

IV. RESULT AND DISCUSSION

- **TABLE 1: FREQUENCY AND PERCENTAGE OF SEX DISTRIBUTION**

Sex	Number of Individuals	Percentage (%)
Boys	35	53.03
Girls	31	46.97

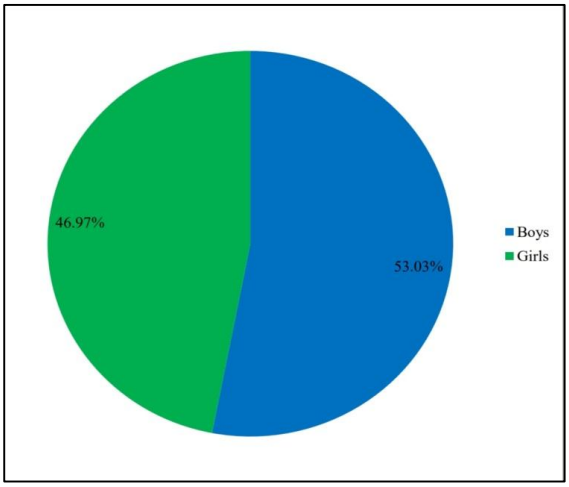

Fig. 1 Pie Chart showing Percentage of Sex Distribution

Table 1 interprets that the total number of boys is 35 and the total number of girls is 31 out of 66. The percentage of boys and girls is 53.03% and 46.97% respectively.

- **TABLE 2: FREQUENCY AND PERCENTAGE OF AGE DISTRIBUTION**

Age	Number of Individuals	Percentage (%)
Birth- 1 year	9	13.63
1.1 years- 2 years	11	16.67
2.1 years- 3 years	18	27.28
3.1 years- 4 years	17	25.75
4.1 years- 5 years	11	16.67

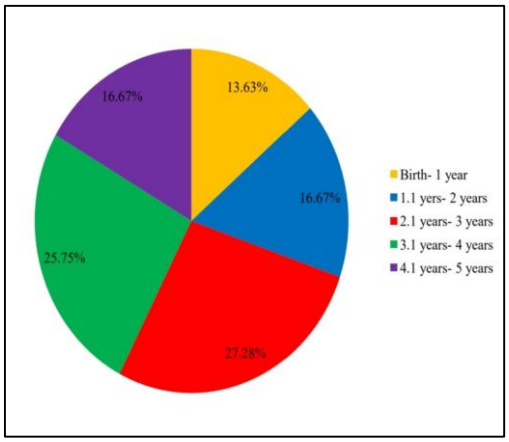

Fig. 2 Pie Chart showing Percentage of Age Distribution

Table 2 interprets that in the range of birth- 1 year there are 9 children and the percentage is 13.63%. In 1.1 years- 2 years and 4.1 years- 5 years, there are 11 children and the percentage is 16.67%. In 2.1 years- 3 years, 18 children are there with the percentage of 27.28% and in the range of 3.1 years- 4 years, 17 children are there with the percentage of 25.75%.

- **TABLE 3: DESCRIPTIVE STATISTICS OF BOYS**

Descriptive Statistics	Height (cm)	Weight (kg)	MUAC (cm)
Mean	87.02	12.34	14.45
Median	88.3	12	14.5
SD	12.07	3.24	1.42

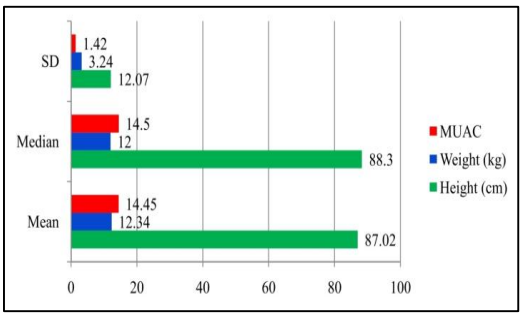

Fig. 3 Bar Diagram showing Descriptive Statistics of Boys

Table 3 shows Mean, Median and Standard Deviation of Height, Weight and MUAC of boys. In case of height mean is 87.02 cm, median is 88.3 cm and SD is 12.07. In case of weight mean is 12.34 kg, median is 12 kg and SD is 3.24. In case of MUAC mean is 14.45 cm, median is 14.5 cm and SD is 1.42.

- **TABLE 4: DESCRIPTIVE STATISTICS OF GIRLS**

Descriptive Statistics	Height (cm)	Weight (kg)	MUAC (cm)
Mean	91.05	12.21	15
Median	89.6	12	15
SD	10.13	2.86	1.42

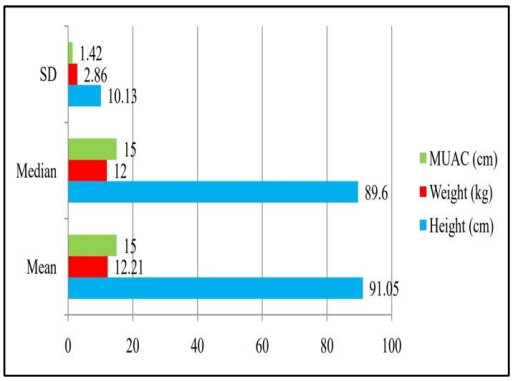

Fig. 4 Bar Diagram showing Descriptive Statistics of Girls

Table 4 shows Mean, Median and Standard Deviation of Height, Weight and MUAC of girls. In case of height mean is 91.05 cm, median is 89.6 cm and SD is 10.13. In case of weight mean is 12.21 kg, median is 12 kg and SD is 2.86. In case of MUAC mean is 15 cm, median is 15 cm and SD is 1.42.

- **TABLE 5: FREQUENCY DISTRIBUTION AND PERCENTAGE OF HEIGHT- FOR- AGE OF BOYS**

Height- for-age	Number of boys	Percentage (%)	Category
-3 <HAZ> -2	5	14.28	Moderately Stunted
-2 <HAZ> -1	8	22.86	Marginally Stunted
-1 <HAZ> 3	22	62.86	Normal

Table 5 shows that, 5 boys with the percentage of 14.28% are moderately stunted. 8 boys with the percentage of 22.86% are marginally stunted and 22 boys with the percentage of 62.86% are normal.

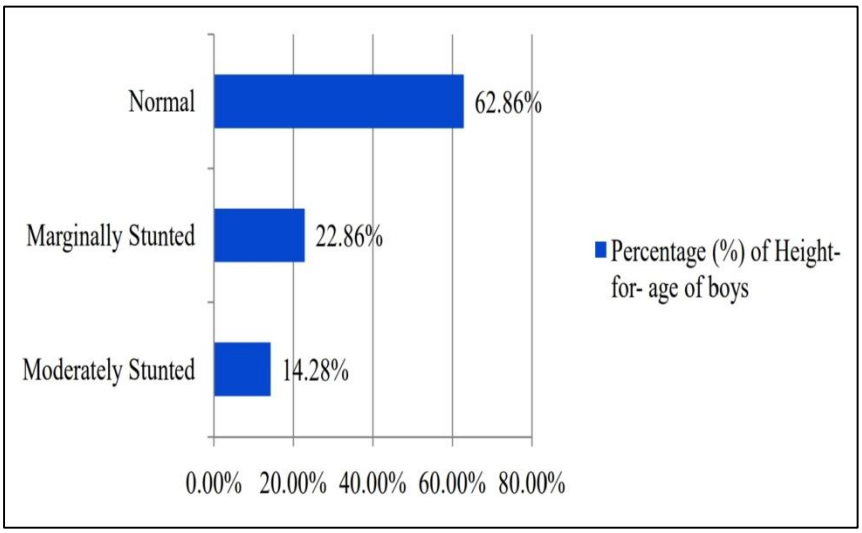

Fig. 5 Bar Diagram showing Height- for- age of Boys

- **TABLE 6: FREQUENCY DISTRIBUTION AND PERCENTAGE OF HEIGHT- FOR- AGE OF GIRLS**

Height- for- age	Number of girls	Percentage (%)	Category
-3 <HAZ> -2	1	3.22	Moderately Stunted
-2 <HAZ> -1	11	35.49	Marginally Stunted
-1<HAZ> 3	19	61.29	Normal

Table 6 shows that, 1 girl with the percentage of 3.22% is moderately stunted. 11 girls with the percentage of 35.49% are marginally stunted and 19 girls with the percentage of 61.29% are normal.

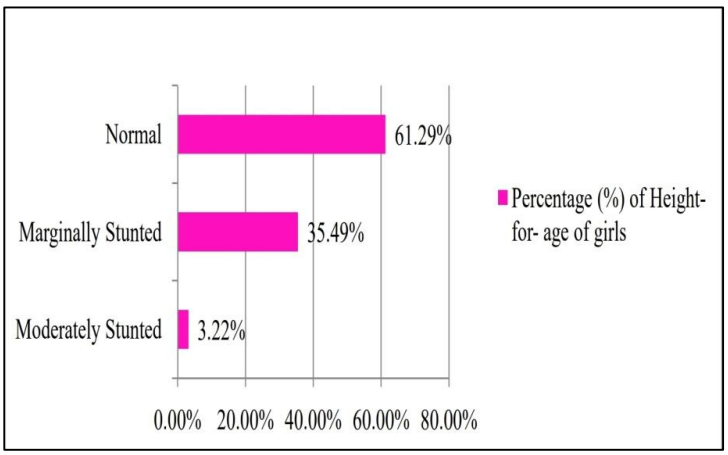

Fig. 6 Bar Diagram showing Height- for- age of Girls

- **TABLE 7: PERCENTAGE OF HEIGHT- FOR- AGE OF STUDIED CHILDREN (BOYS AND GIRLS)**

Category of Height- for- age	Percentage (%) of boys	Percentage (%) of girls
Normal	62.86	61.29
Marginally Stunted	22.86	35.49
Moderately Stunted	14.28	3.22

Table 7 shows the percentages of height- for- age of both boys and girls of the studied children.

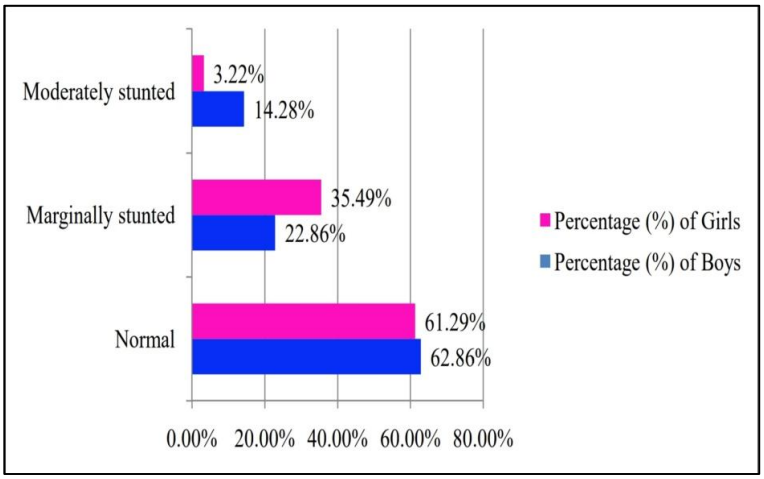

Fig. 7 Bar Diagram showing Height- for- age of Boys and Girls

- **TABLE 8: FREQUENCY DISTRIBUTION AND PERECENTAGE OF WEIGHT- FOR- AGE OF BOYS**

Weight- for- age	Number of boys	Percentage (%)	Category
-3 <WAZ> -2	7	20	Moderately Underweight
-2 <WAZ> -1	8	22.86	Marginally Underweight
-1 <WAZ> 3	20	57.14	Normal

Table 8 shows that, 7 boys with the percentage of 20% are moderately underweight. 8 boys with the percentage of 22.86% are marginally underweight and 20 boys with the percentage of 57.14% are normal.

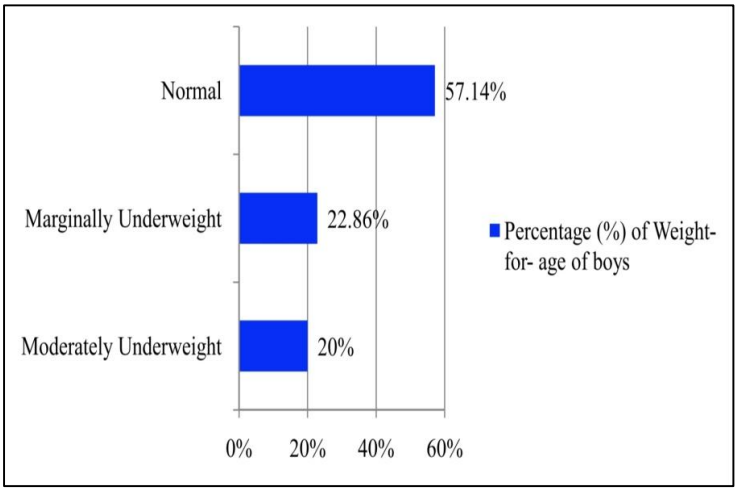

Fig. 8 Bar Diagram showing Weight- for- age of Boys

- **TABLE 9: FREQUENCY DISTRIBUTION AND PERECENTAGE OF WEIGHT- FOR- AGE OF GIRLS**

Weight- for- age	Number of girls	Percentage (%)	Category
-3 <WAZ> -2	3	9.67	Moderately Underweight
-2 <WAZ> -1	7	22.59	Marginally Underweight
-1 <WAZ> 3	21	67.74	Normal

Table 9 shows that, 3 girls with the percentage of 9.67% are moderately underweight. 7 girls with the percentage of 22.59% are marginally underweight and 21 girls with the percentage of 67.74% are normal.

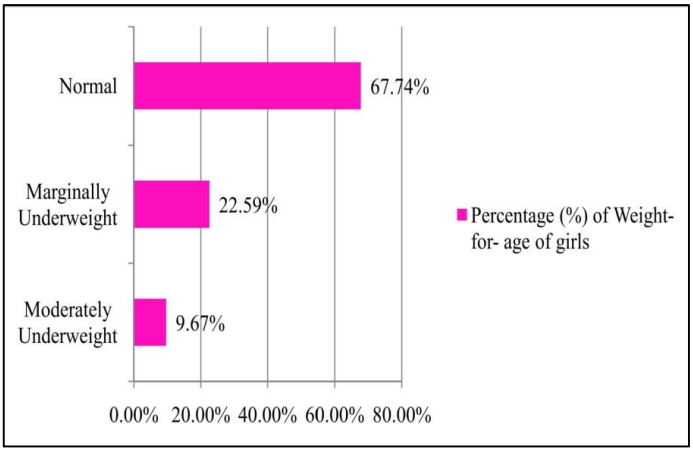

Fig. 9 Bar Diagram showing Weight- for- age of Girls

- **TABLE 10: PERCENTAGE OF WEIGHT- FOR- AGE OF STUDIED CHILDREN (BOYS AND GIRLS)**

Category of Weight-for- age	Percentage (%) of boys	Percentage (%) of girls
Normal	57.14	67.74
Marginally Underweight	22.86	22.59
Moderately Underweight	20	9.67

Table 10 shows the percentages of weight- for- age of both boys and girls of the studied children.

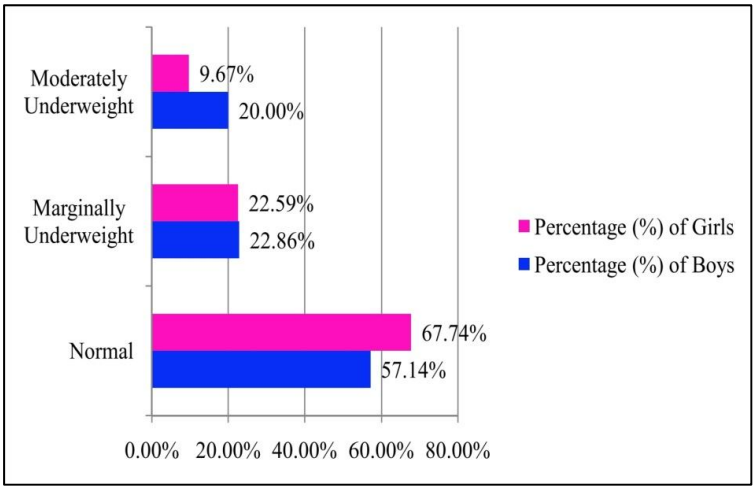

Fig. 10 Bar Diagram showing Weight- for- age of Boys and Girls

- **TABLE 11: FREQUENCY DISTRIBUTION AND PERECENTAGE OF WEIGHT- FOR- HEIGHT OF BOYS**

Weight- for-height	Number of boys	Percentage (%)	Category
-3 <WHZ> -2	3	8.57	Moderately Wasted
-2 <WHZ> -1	8	22.85	Marginally Wasted
-1 <WHZ> 3	24	68.58	Normal

Table 11 shows that, 3 boys with the percentage of 8.57% are moderately wasted. 8 boys with the percentage of 22.85% are marginally wasted and 24 boys with the percentage of 68.58% are normal.

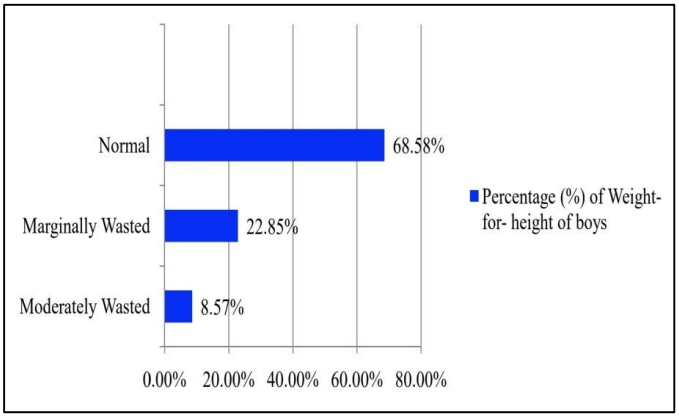

Fig. 11 Bar Diagram showing Weight- for- height of Boys

• TABLE 12: FREQUENCY DISTRIBUTION AND PERECENTAGE OF WEIGHT- FOR- HEIGHT OF GIRLS

Weight- for-height	Number of girls	Percentage (%)	Category
-3 <WHZ> -2	3	9.68	Moderately Wasted
-2 <WHZ> -1	6	19.35	Marginally Wasted
-1 <WHZ> 3	22	70.97	Normal

Table 12 shows that, 3 girls with the percentage of 9.68% are moderately wasted. 6 girls with the percentage of 19.35% are marginally wasted and 22 girls with the percentage of 70.97% are normal.

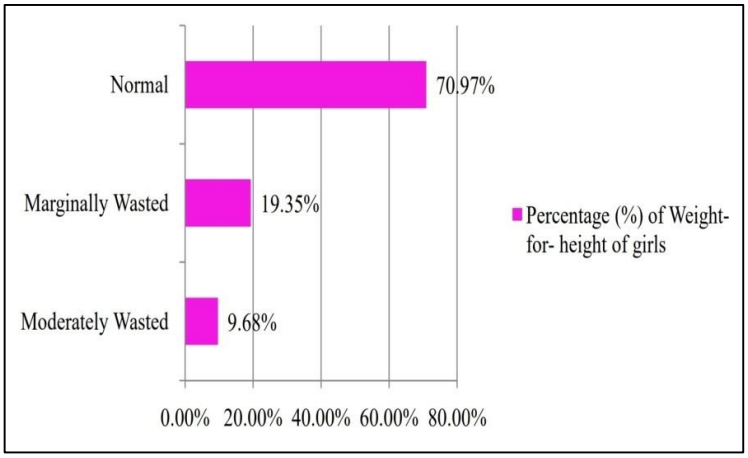

Fig. 12 Bar Diagram showing Weight- for- height of Girls

• TABLE 13: PERCENTAGE OF WEIGHT- FOR- HEIGHT OF STUDIED CHILDREN (BOYS AND GIRLS)

Category of Weight- for-height	Percentage (%) of boys	Percentage (%) of girls
Normal	68.58	70.97
Marginally Wasted	22.85	19.35
Moderately Wasted	8.57	9.68

Table 13 shows the percentages of weight- for- height of both boys and girls of the studied children.

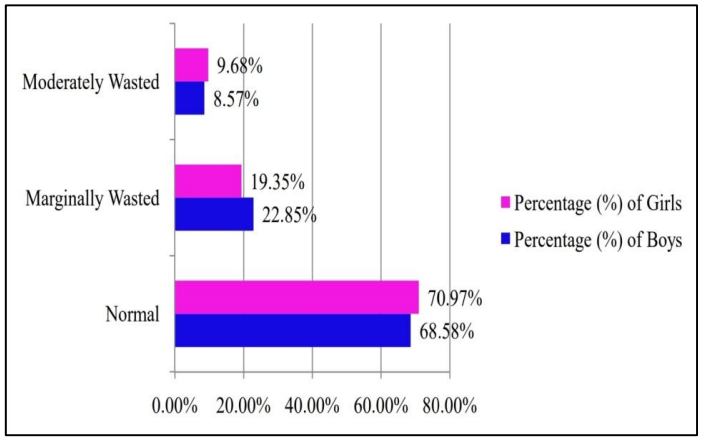

Fig. 13 Bar Diagram showing Weight- for- height of Boys and Girls

- **TABLE 14: FREQUENCY AND PERCENTAGE OF INCOME OF PARENTS OF THE STUDIED CHILDREN**

Income (in Rs.)	Number of Individuals	Percentage (%)
Below 8000	12	18.18
8000- 13000	44	66.67
13000- 18000	8	12.12
Above 18000	2	3.03

Table 14 shows that, 12 individuals with the percentage of 18.18% have an income in the range of below Rs. 8000. 44 individuals with the percentage of 66.67% have an income in the range of Rs. 8000-13000. 8 individuals which is 12.12% have an income in the range of Rs. 13000-18000 and 2 individuals which is 3.03% have an income in the range of above 18000.

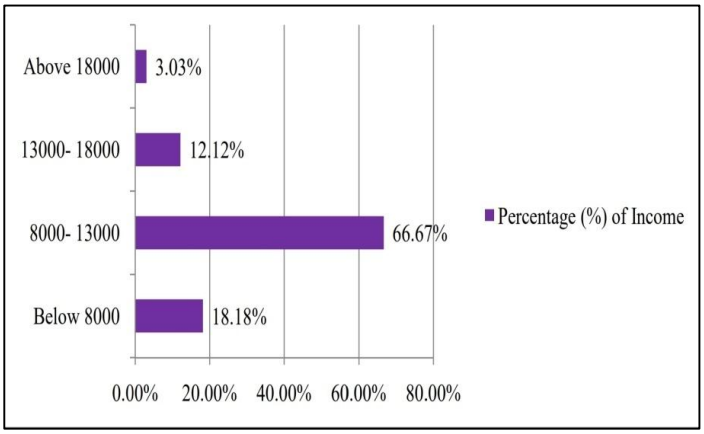

Fig. 14 Bar Diagram showing Percentage of Income

- **TABLE 15: FREQUENCY AND PERCENTAGE OF OCCUPATION OF PARENTS OF THE STUDIED CHILDREN**

Occupation	Number of individuals	Percentage (%)
Daily Labourer	34	51.51
Business	22	33.33
Service	10	15.16

Table 15 shows that, 34 individuals which is 51.51% are daily labourers. individuals with the percentage of 33.33% have business and 10 individuals with percentage of 15.16% doing service.

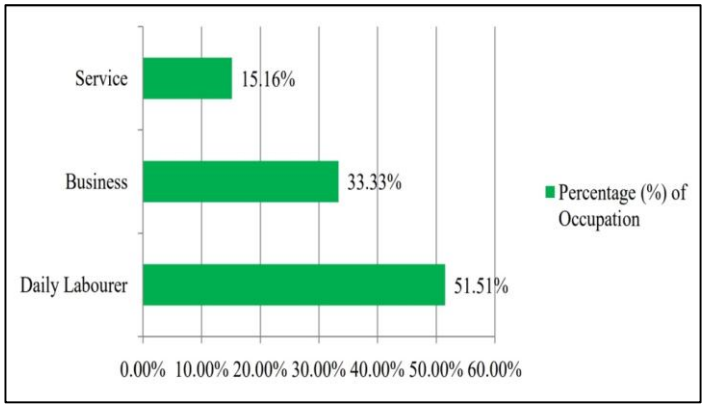

Fig. 15 Bar Diagram showing Percentage of Occupation

- **UNPAIRED T TEST**

° **Height -** The two- tailed P value is equals 0.1496. By conventional criteria, this difference is considered to be not statistically significant. Value of t is 1.4586. Standard error of difference is 2.763. Degree of freedom is 64. The mean of boys minus girls are equal – 4.0300. Confidence interval of this difference is 95%.

° **Weight -** The two- tailed P value is equals 0.8641. By conventional criteria, this difference is considered to be not statistically significant. Value of t is 0.1718. Standard error of difference is 0.757. Degree of freedom is 64. The mean of boys minus girls are equal 0.1300. Confidence interval of this difference is 95%.

° **MUAC -** The two- tailed P value is equals 0.1212. By conventional criteria, this difference is considered to be not statistically significant. Value of t is 1.5704. Standard error of difference is 0.350. Degree of freedom is 64. The mean of boys minus girls are equal – 0.5500. Confidence interval of this difference is 95%.

V. CONCLUSION

In this present study, below 5 years children were studied with the help of nutritional assessment to observe their nutritional status. To assess the nutritional status the anthropometric measurements have taken like Height, Weight and MUAC. Also the socio demographic profile was taken of those studied children and their parents i.e., income and occupational status. The total studied children were 66 in which 35 are boys and 31 are girls. The value of nutritional status was calculated and categorized and observed the value of z-score provided the chart by WHO (2006).

From the assessment of Height- for- age, the result shows that 14.28% boys and 3.22% girls are moderately stunted.

From the analysis of the table of Weight- for- age, 20% boys and 9.67% girls are moderately underweight.

From the analysis of the table of Weight- for- height it is found that 8.57% boys and 9.68% girls are moderately wasted.

In the collected data of socio-demographic profile the occupational status as well as the amount of income was found. The data was categorized in three divisions like Daily Labourer, Service and Business based on occupation and the income amount ranged from below Rs.8000 to 18000.

Data of income was collected to observe whether the children were taking proper nutrition but no significant data was found from this present study.

Unpaired t test of height, weight and MUAC was also calculated of the studied children.

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