

## “Statistical Analysis of Malnutrition of Anaganwadi & Sugarcane Labor’s children: Case Study”

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### **Abstract:**

It is very essential for every one of every age group to intake proper balanced diet. And if care is not taken it may cause health problems. Malnutrition occurs when an individual gets less amount of nutrients (can be considered as underweight) or too much amount of nutrients (can be considered as overweight) which results in health issues. This paper states the nutritional status of child and mother. And comparative study of children going to Anganwadi and Sugarcane cutter’s children and their mothers. This study consists of 80 children and 80 mothers in Phaltan Teshil. The statistically significant factors are Body mass index (BMI) of mother, children, economic condition of family, education of mother etc.

**Keywords :** Malnutrition, Nutritional status, Underweight, Overweight, Chi- square test .

### **Introduction :**

Malnutrition refers preferably to health condition of children. It is observed that now a days most of the children don’t intake proper diet which lead to health issues. Economic condition, poverty may be the main reason behind it. Nutrition is the sum of total process involved in utilization of food substance proper growth, repair and maintenance of body accomplished. As [1] Nutritious foods are essential for all ages but their need is higher during childhood especially under five years of age of their growing. [2] Good nutrition combined with regular exercise is concerned with good health, and poor health poor nutrition leads to reduced immunity, increases susceptibility to disease which reduces productivity. Underweight or under nutrition is the condition which may lead to inadequate condition consumption, excessive loss or poor absorption of nutrients. For health assessment and good health the key indicator is nutritional status. [3] An ideal state of nutrition or nutrient status is when the supply of nutrients conforms to the nutrient requirement or needs. [4] For survival, health and development of country the corner stone is Good Health Good Nutrition. It is very necessary to look upon our health as [5] mortality rate by malnutrition is high, and recovery is complicated by coinfection. And to reduce mortality rate of children mother’s health plays an important role [6] the period of pregnancy to 24 months of age is crucial window of opportunity for reducing under nutrition and its adverse effects. Even [7] factors like number of children under age of 3 years in family, occupation of the parents, marital status, family income, parental education, maternal nutritional knowledge, residence

area i.e rural or urban also plays role.[8]Child malnutrition further affects the country's economic development..

**Operational Definitions:**

i) Body Mass Index (BMI) :

Body mass index is defined as weight in kilograms of individual divided by the height in meter. which is used to defined nutritious status{ < 18.5 kg/m<sup>2</sup>Underweight}, { 18.5 – 24.99 kg/m<sup>2</sup> Normal}, {> 25 kg/m<sup>2</sup> Overweight}

ii) Malnutrition:

Lack of proper nutrition, caused by not having enough to eat, not in taking proper balanced diet not eating enough of the right things, or being unable to use the food that one does eat.

iii) Underweight:

Children of age 0 to 59 months having index value of weight for age below minus 2 standard deviation units (<-2SD)

iv) Overweight :

Children of age 0 to 59 months having index value of weight for age above plus 2 standard deviation units (>+2SD)

**Methods used in Data Analysis :**

The data was analyzed by descriptive and inferential statistics. In descriptive Statistics varous different tools are used such as frequency distribution table, simple bar diagram, double bar diagram , pie-chart etc. for gender wise comparative purpose, nutritious staus of Anganwadi children and Sugarcane cutters children etc. and Inferntial statistics is used to see association between dependent variables and independent variables. (i.e nutritious status and associated factors). And for that chi-square test is used.

**Research strategy :**

This study is based on analysis of Anganwadi children and sugarcane cutter's children under age of 5years. Sugarcane cutters and their children are considered for study. As economic condition of sugarcane cutter is not nice, and they migrate from one place to another for work. This study is also based on health of mothers of this children. Parameters included for this study are Body Mass Index (BMI) of both children and their mothers and also annual income their family Also Education of mother and child health are independent or not is also checked

**Objectives:**

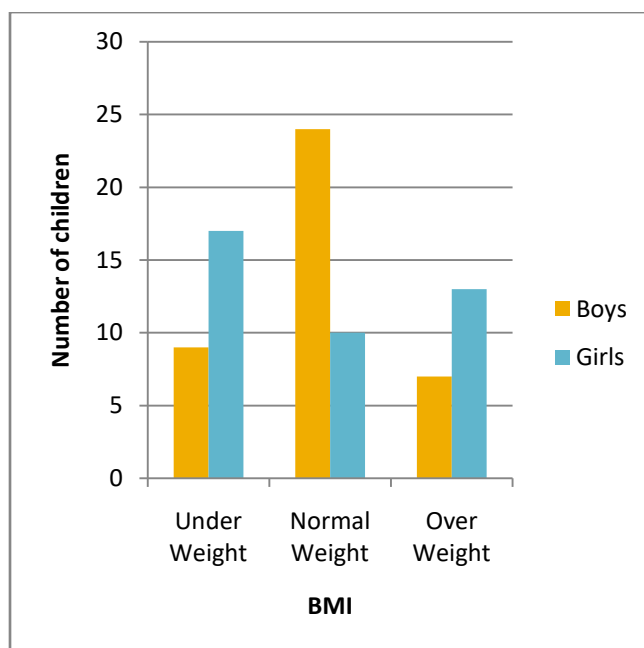
1. To compare Gender wise health condition of children.
2. To check children are affected by which disease more.
3. To compare health condition of Anganwadi children and Sugarcane cutter's children.
4. To study whether mother's health during birth time of her child and child's health is independent or not.
5. To check annual income of family and child's health is independent or not.
6. To find out whether mother education and child health are independent or not.

**Result and Analysis:**

I) AIM : To study the Comparison between boys & girls BMI.

Observation table : -

BMI	Boys	Girls
Under Weight	9	17
Normal Weight	24	10
Over Weight	7	13

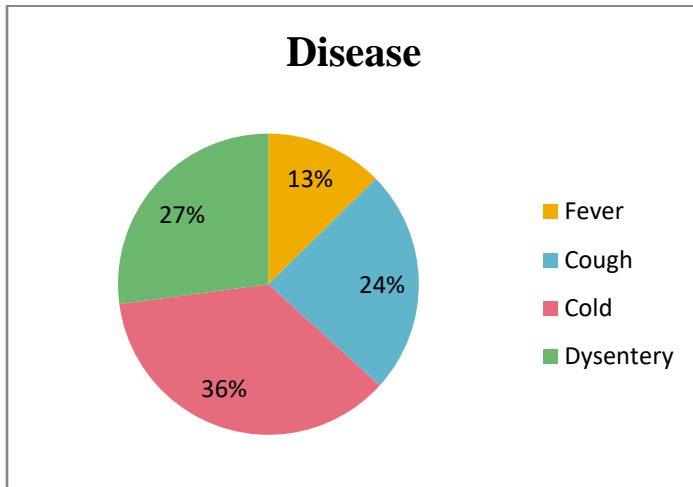


Conclusion: According to above graph it can be concluded that boys are healthier compared to girls.

II) AIM : To check children are affected by which disease more.

Observation table :

Disease	No. of children affected
Fever	21
Cough	40
Cold	60
Dysentery	45

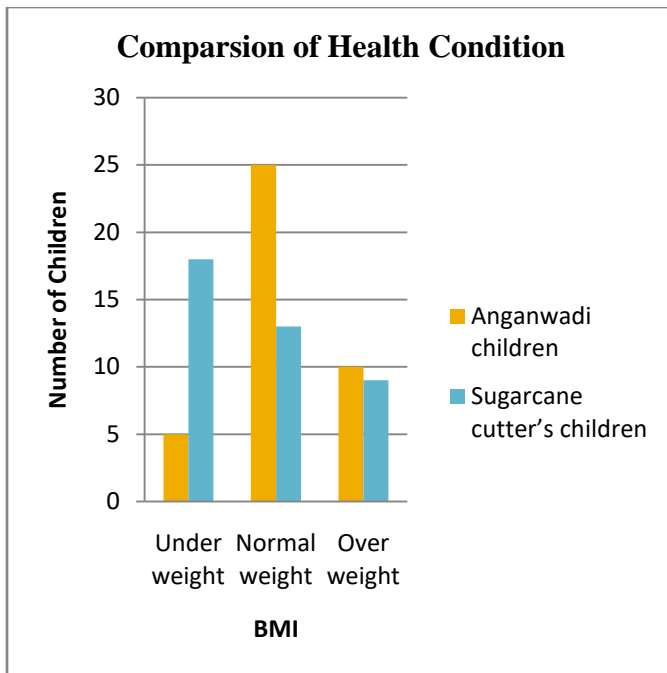


Conclusion : Above Pie-chart states that children are affected by Cold more.

III) AIM : To compare health of Anganwadi Children and Sugarcane cutter's children.

Observation table:

	Under weight	Normal weight	Over weight
Anganwadi children	5	25	10
Sugarcane cutter's children	18	13	9



Conclusion : From above graph concludes that according to BMI Aganwadi children are healthy compared to Sugarcane cutter's children.

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IV) AIM : To check weather health of mother during birth time of her child and health of child are independent or not.

Hypothesis:

$H_0$  : Mother health and her child health are independent.

v/s

$H_1$  : Mother health and child health are not independent.

Under  $H_0$  the test statistic is given by ,

$$\chi^2 = \sum_{i=0}^n \frac{O_i^2}{E_i} - N \sim \chi^2_{(n-1)(m-1), \alpha} \text{ df}$$

Child health /Annual income	Under Weight	Normal	Over weight	Total
Below 50,000	16	15	11	42
50,000-75,000	3	19	1	23
75,000-1,00,000	2	3	7	12
More than 1,00,000	1	1	1	3
Total	22	38	20	80

	Healthy	Non-Healthy	Total
Mother	28	12	40
Child	18	25	40
Total	43	37	80

Observation Table:

$O_i$	$E_i$	$O_i^2 / E_i$
28	21.5	36.4651
12	18.5	7.7837
15	21.5	10.4651
25	18.5	33.7837
Total		<b>88.4878</b>

Calculation:  $\text{Cal } \chi^2 = \sum_{i=0}^n \frac{O_i^2}{E_i} - N$

$= 88.4978001 - 80 = 8.4978001$

$\text{Tab } \chi^2 = \chi^2_{(n-1)(m-1), \alpha} \text{ df} = \chi^2_{(1,0.05)} = 3.8414591$

Conclusion:

$\text{Cal } \chi^2 > \text{Tab } \chi^2$

Hence, we reject  $H_0$  at 5% level of significance. It can be conclude that Mother health during birth time of her child & child health are not independent.

V) AIM:- To check whether economic status of family and child health are independent or not.

Hypothesis : we want to test,

$H_0$ : Economic status and child health are independent.

v/s

$H_1$ : Economic status and child health are not independent.

Under  $H_0$  the test statistic is given by ,

$$\chi^2 = \sum_{i=0}^n \frac{O_i^2}{E_i} - N \sim \chi^2_{(n-1)(m-1), \alpha}$$

Observation table:-

O <sub>i</sub>	E <sub>i</sub>	O <sub>i</sub> <sup>2</sup>	(O <sub>i</sub> <sup>2</sup> /E <sub>i</sub> )	(O <sub>i</sub> <sup>2</sup> /E <sub>i</sub> )
16	11.55	256	22.164	22.165
15	19.95	225	11.278	11.278
11	10.5	121	11.523	12.947
3	6.325	9	1.4229	36.008
19	10.925	361	33.043	
1	5.75	1	0.1739	
2	3.3	4	1.2121	
3	5.7	9	1.5789	
7	3	49	16.333	19.581
1	0.825	1	1.2121	
1	1.425	1	0.7017	
1	0.75	1	1.3333	
Total			<b>101.9784</b>	<b>101.98</b>

Calculation:-  $Cal \chi^2 = \sum_{i=0}^n \frac{O_i^2}{E_i} - N$   
 $= 101.98 - 80 = 21.9784$

Tab  $\chi^2 = \chi^2_{(n-1)(m-1), \alpha} = \chi^2_{(6,0.05)} = 12.59159$

Conclusion:-

Cal  $\chi^2 > Tab \chi^2$

Hence, we reject H<sub>0</sub> at 5% level of significance & conclude that, economic status and child health are not independent.

VI) AIM :- To check whether mother education & child health are independent or not.

Hypothesis :- we want to test,

H<sub>0</sub>:- Mother education & child health are independent

V/S

H<sub>1</sub>:- Mother education & child health are not independent.

Under H<sub>0</sub> the test statistic is given by ,

$\chi^2 = \sum_{i=0}^n \frac{O_i^2}{E_i} - N \sim \chi^2_{(n-1)(m-1), \alpha}$

Mother education:	Healthy	Not Healthy	Total
Primary	5	24	29
Higher	38	13	51
Total	43	37	80

Observation Table:

O <sub>i</sub>	E <sub>i</sub>	O <sub>i</sub> <sup>2</sup>	O <sub>i</sub> <sup>2</sup> /E <sub>i</sub>
5	15.5875	25	1.603849
24	13.4125	576	42.94501
38	27.4125	1444	52.6767
13	23.5875	169	7.164812
Total			104.3904

$$\text{Calculation: Cal } \chi^2 = \sum_{i=0}^n \frac{O_i^2}{E_i} - N = 104.3904 - 80 = 24.3903$$

$$\text{Tab } \chi^2 = \chi^2_{(n-1)(m-1), \alpha} = \chi^2_{(1,0.05)} = 3.841.488$$

Conclusion:-

$$\text{Cal } \chi^2 > \text{Tab } \chi^2$$

Hence, we reject H<sub>0</sub> at 5% level of significance & it conclude that, education of mother and child health are dependent.

### Conclusions:

This study was focused on comparative study of health of Anganwadi children and Sugarcane cutter children under age five. From collected sample data we can state that Anganwadi children are healthier compared to sugarcane children. Also we concluded that health condition of boys below five years is good compared to that of girl children below five years. Even we also concluded that health of mother during birth of her child and child health are dependent on each other.

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