

A Study of Magnitude of Malnutrition among Children under 6 Years of Age**Dr. Surendra Kumar Gupta**Assistant Professor,
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Abstract

The paper entitled “A Study of Magnitude of Malnutrition among Children under 6 Years of Age” is an attempt to analyze malnutrition among the selected subgroups of children and their various categories and factors responsible for malnutrition. According to Global Nutritional Report 2016 'The economic consequences represent losses of 11 percent of gross domestic product (GDP) every year in Africa and Asia, whereas preventing malnutrition delivers \$16 in returns on investment for every \$1 spent. It means for future development of country it is prerequisite to invest on child nutrition. Nutrition problems among children cause major morbidity and mortality in India. Nutrition as a whole and particularly of children is the outcome of a complex interaction of a broad range of physical and cultural factors. To develop a rational policy for solving the malnutrition problems of children, it is important to have a precise knowledge of magnitude of the problem and the related factors. In this paper an attempt to know the status of malnutrition in children using indicators of malnutrition such as; Weight-for-Age Z-score (WAZ), Height-for-Age Z- score (HAZ) and to assess the magnitude and factors associated with malnutrition among children under 6 years of age. In the present study assessment of the nutritional status of the child was done with the help of anthropometric indicators. The paper is divided in three sections. Section I discusses keywords, research question, objectives of study, hypothesis. Section II describes methodology pertaining to data collection and statistical tools use to data analysis and testing of hypothesis. Section III highlights and focuses on conclusion on policy suggestion.

Key terms: Causal Factors: Factors such as; demographic factors, social norms and family related factors, ignorance, poverty, inadequate food intake, diseases etc responsible for malnutrition are called causal factors in the present study.

Malnutrition is simply defined as imperfect or faulty nutrition. Whenever there is an imbalance between body needs for certain nutrient and their intake, malnutrition is said to have occurred.

Section-I

Introduction

The future of a nation is linked with the well being of its children, which depends to a considerable extent on their nutritional status. In this sense, the nutritional status of children may be considered representative of the level of development of a nation. Nutrition as a whole and particularly of children is the outcome of a complex interaction of a broad range of physical and cultural factors. To develop a rational policy for solving the malnutrition problems of children, it is important to have a precise knowledge of magnitude of the problem and to related factors. Therefore, it is necessary to know whether malnutrition of children is associated entirely by the economic factors or in part by others factors, such as; demographic factors, social norms and family related factors etc. Nutrition problems among children cause major morbidity and mortality in India. Despite of spectacular increase in food grain production in recent years the problems of chronic malnutrition continues to exist extensively; especially among children below 6 years of age they are caught in a relentless sequence of ignorance, poverty, inadequate food intake, diseases and early death. According to Global Nutritional Report 2016 'The economic consequences represent losses of 11 percent of gross domestic product (GDP) every year in Africa and Asia, whereas preventing malnutrition delivers \$16 in returns on investment for every \$1 spent. It means for future development of country it is prerequisite to invest on child nutrition.

Malnutrition, a critical health problem of childhood in developing countries, is widely accepted as main cause of mortality and morbidity among children. Malnutrition is simply defined as imperfect or faulty nutrition. Whenever there is an imbalance between body needs for certain nutrient and their intake, malnutrition is said to have occurred. It can be of two types: undernutrition - a condition where the body requirements for nutrients are not met and overnutrition when these are oversupplied. But malnutrition and undernutrition are generally used synonymously because a vast majority of the people is undernourished in our country than over-nourished. WFP² defines malnutrition as “a state in which the physical function of an individual is impaired to the point where he or she can no longer maintain adequate

². World Food Programme

bodily performance process such as growth, pregnancy, lactation, physical work and resisting and recovering from disease.” In this paper assessment of the nutritional status of the child take place by anthropometric indicators. It has been used not only to provide information on the nutritional and health status of children, but also as an indirect measure of the quality of life of the entire community. Anthropometric method is a quantitative method; it also considers the different types of measurements like, height-for-age, weight-for-age and weight-for-height.

Objectives of the Study:

- To assess the category of malnutrition in children using indicators of malnutrition such as; Weight-for-Age Z- score (WAZ), Height-for-Age Z- score (HAZ).
- To study the factors associated with malnutrition among children under 6 years of age.

Hypothesis:

Null Hypothesis HO1: Sex of Children is independent of nutritional category.

Alternative Hypothesis HA1: Sex of Children is statistically significantly associated with the nutritional category.

Null Hypothesis HO2: Educational level of mother's of children is independent of nutritional category.

Alternative Hypothesis HA2: Educational level of mother's of is statistically significantly associated with the nutritional category.

Null Hypothesis HO3: Poverty Intensive Groups are independent of nutritional category.

Alternative Hypothesis HA3: Poverty Intensive Groups are statistically significantly associated with the nutritional category.

Null Hypothesis HO4: Age Groups of children are independent of nutritional category.

Alternative Hypothesis HA4: Age Groups of children are statistically significantly associated with the nutritional category.

Methodology:

In order to study the magnitude of Malnutrition among children under six year age group of Varanasi district, a survey is conducted for Varanasi District for BPL households in which Varanasi District is chosen purposively at the first stage. In Varanasi District there are 8 blocks namely; Kashividhyapeeth, Sewapuri, Pindra, Chiraigaon, Harhua, Baragaon, Cholaapur and Arazilines. Out of eight blocks of Varanasi district four blocks are selected

randomly namely; Kashividhyapeeth, Sewapuri, Pindra, Chiraigaon. Out of these selected blocks, list of villages were prepared and from this list four villages were selected from each block randomly. From each selected village a list of BPL households were prepared and then 20 BPL household had been selected randomly for getting responses about the children below age six. Thus research design is multistage mixed, purposive and random sampling technique and ultimately selected total size of sample respondents (mainly mothers of children) are 320 (4*4*20). Since survey is related to the measurement of Weight, Age and Height of Children below age of 6 years, therefore, research design includes experimental method and getting true observations of Weight, Age and Height of children through measurement as well as households head (Male/Female) responses.

Section 2

After conducting the survey following tables is constructed, we describe demographic characteristics of the children according to age groups in months.

Table 1: Demographic Characteristics

General Characteristics	Age in months												Total	
	0-12		13-24		25-36		37-48		49-60		61-72			
	No.	%	No	%	No	%	No	%	No	%	No	%	No.	%
Religion														
Hindu	41	15	54	19.8	46	16.8	62	22.7	42	15.4	28	10.3	273	85.3
Muslim	10	21.3	4	8.5	10	21.3	10	21.3	7	14.9	6	12.8	47	14.7
Caste														
General	0	0	3	18.5	1	10	4	40	0	0	2	20	10	3.1
Backward case	36	18.8	33	17.3	31	16.2	38	19.9	32	16.8	21	11	191	59.7
Scheduled caste	15	12.6	22	33	24	20.2	30	25.2	17	14.3	11	9.2	119	37.2
Sex														
Male	27	15	33	18.3	27	15	34	18.9	31	17.2	28	15.6	180	56.3
Female	24	17.1	25	17.9	29	20.7	38	27.1	18	12.9	6	4.3	140	43.7
Total	51	15.9	58	18.1	56	17.5	72	22.5	49	15.3	34	10.6	320	100

Field Survey

Table 2 describes to category of malnutrition in children on the basis of SD classification.

Table 2
Classification of Children according to Underweight (Weight for Age) (WAZ)

Category of Malnutrition	Number of Children
Normal	82 (25.6)
Mildly Malnourished	134 (41.9)
Moderately Malnourished	73 (22.8)
Severely Malnourished	31 (9.7)
Total	320 (100.0)

Table describes the factors associated with the category of malnutrition among children under six year of age.

Table 3

	Normal		Mild		Moderate		Severe		Total	
	No	%	No.	%	No.	%	No.	%	No	%
Age in Months										
0-12	5	9.8	15	29.4	15	29.4	16	31.4	51	15.9
13-24	25	43.1	19	32.8	10	17.4	4	6.9	58	18.1
25-36	18	32.1	26	46.4	11	19.6	1	1.8	56	17.5
37-48	20	27.8	19	40.3	14	19.4	9	12.5	72	22.5
49-60	8	16.3	24	49	16	32.7	1	2	49	15.3
61-72	6	17.6	21	61.8	7	20.6	0	0	34	10.6
Sex of Children										
Male	46	25.6	79	43.9	38	21.1	17	9.4	180	56.3
Female	36	25.7	55	39.3	35	25	14	10	140	43.7
Education of Mothers										
Illiterate	25	16.4	62	40.8	43	28.3	22	14.5	152	47.5
Primary	27	39.7	20	29.4	17	25	4	5.9	68	21.3
Middle	27	33.8	41	51.3	8	10	4	5	80	25.0
High school	3	15	11	55	5	25	1	5	20	6.3
Poverty Intensive Groups³										
Lower	6	15.4	9	23.1	14	35.9	10	25.6	39	12.2
Middle	46	24	85	44.3	45	23.4	16	8.3	192	60
Upper	30	33.7	40	44.9	14	15.7	5	5.6	89	27.8

Table 3(a) describes the distribution of malnutrition according to sex of children (2X4 contingency table).

Table 3(a)

Sex of Children	Category of Malnutrition (WAZ) (Weight for Age) (Underweight)				Total
	Normal	Mild	Moderate	Severe	
Male	46 (25.6)	79 (43.9)	38 (21.1)	17 (9.4)	180 (100)
Female	36 (25.7)	55 (39.3)	35 (25)	14 (10)	140 (100)
	82 (25.6)	134 (41.9)	73 (22.8)	31 (9.7)	320 (100)

Table 3(b) shows the distribution of malnutrition according to the level of education of mother (4X4 contingency table).

Table 3(b)

Mother's Education Level	Category of Malnutrition (WAZ) (Weight for Age) (Underweight)				Total
	Normal	Mild	Moderate	Severe	
Illiterate	25(16.4)	62(40.8)	43(28.3)	22(14.5)	152(100)
Primary	27(39.7)	20(29.4)	17(25)	4(5.9)	68(100)
Middle	27(33.8)	41(51.3)	8(10)	4(5)	80(100)
High School	3(15)	11(15)	5(25)	1(5)	20(100)
	82(25.6)	134(41.9)	73(22.8)	31(9.7)	320(100)

Table 3(c) describes the distribution of malnutrition according to Poverty Intensive Groups (3X4 contingency table).

Table 3(c)

Poverty Intensive Groups	Category of Malnutrition (WAZ) (Weight for Age) (Underweight)				Total
	Normal	Mild	Moderate	Severe	
Lower	6(15.4)	9(23.1)	14(35.9)	10(25.6)	39(100)
Middle	46(24)	85(44.3)	45(23.4)	16(8.3)	192(100)
Upper	30(33.7)	40(44.5)	14(15.7)	5(5.6)	89(100)
	82(25.6)	134(41.9)	73(22.8)	31(9.7)	320(100)

Table 3(d) describes the distribution of malnutrition according to Poverty Intensive Groups (6X4 contingency table).

Table 3(d)

Age Groups	Category of Malnutrition (Weight for Age) (Underweight) (WAZ)				Total
	Normal	Mild	Moderate	Severe	
0-12 Month	5 (9.8)	15 (29.4)	15 (29.4)	16 (31.4)	51 (100)
13-24 Month	24 (43.1)	19 (32.8)	10 (17.4)	4 (6.9)	58 (100)
25-36 Month	18 (32.1)	26 (46.4)	11 (19.4)	1 (1.8)	56 (100)
37-48 Month	20 (27.8)	29 (40.3)	14 (19.4)	9 (12.5)	72 (100)
49-60 Month	8 (16.3)	24 (49.0)	16 (32.7)	1 (2.0)	49 (100)
61-72 Month	6 (17.6)	21 (61.8)	7 (20.6)	0 (0)	34 (100)
	82 (25.6)	134 (41.9)	73 (22.8)	31 (9.7)	320 (100)

Section III

Data Analysis & Statistical tool used for data analysis:

$$\chi^2_{\text{cal}} = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where f_{oi} = observed frequency of i^{th} cell

F_{ei} = Expected frequency of i^{th} cell

No. of degree of freedom for (mXn) contingency table = (m-1) (n-1) where m= no. of rows in contingency table and n= no. of columns in contingency table. χ^2_{tab} Value is taken at 10% level of significance from (Statistical Methods, S.P.Gupta, 28th Edition (English)).

Then comparison of χ^2_{cal} and χ^2_{tab} is made;

If $\chi^2_{\text{cal}} < \chi^2_{\text{tab}}$ = Ho accepted

If $\chi^2_{\text{cal}} \geq \chi^2_{\text{tab}}$ = Ho rejected means HA accepted

Table 4 explains the testing of hypothesis.

Table 4

S.N.	Calculated Value of χ^2	Tabulated Value of χ^2	No. of Degree of Freedom	Level of Significant 10%	Conclusion
H01	1.49	6.251	3		Accepted
H02	16.21	14.684	9		Rejected
H03	28.04	10.645	6		Rejected
H04	24.47	22.307	15		Rejected

Conclusion & Interpretation:

Sex of Children below age six is independent of nutritional category.

Educational level of mother's of is statistically significantly associated with the nutritional category.

Poverty Intensive Groups are statistically significantly associated with the nutritional category.

Age Groups of children are statistically significantly associated with the nutritional category.

This conclusion suggests that for removing the problem of malnutrition among children below age six under BPL population both preventive and positive policies should be made by the government. In view of preventative policy promotion should be made for female education so that female who are expected to become future mothers should take care about their own diets during their pregnancy period as well as on nutritious diet should be provided to the new born babies in age group 0-6 year. Hence fore attack on absolute poverty level of BPL Population is a must and this is only possible by providing suitable jobs by some skill of training in the area concern Varanasi district.

Since poverty intensive groups and malnutrition category are statistically significantly associated therefore, there is a strong need of further research on poverty intensive subgroups according to caste categorization and nutritional status of children.

Since age group of children and malnutrition category of children are statistically significantly associated, therefore further research is required by using some other tools like regression be used for drawing better inferences regarding the relationship of age groups of children and categories of malnutrition.

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