

## **Socio-economic Determinants Affecting Nutritional Outcomes of the Children in Bangladesh**

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**Abstract:** The purpose of this study was to assess the effect of socio-economic determinants on nutritional status of under five children in rural Bangladesh. For this, the study used survey design to collect data from purposively selected 136 samples of under five children in Chandani Mahal which is one of the most notable, industrialized and advanced village of Senhati Union of Dighalia Upazila under Khulna division of Bangladesh. The findings of the study explicate the mean age of the child mother is about 18 years and (83%) participant were Muslims. Most of the participant (78.7%) belong to nuclear family living in only one roomed house with more than four persons. (9%) mother is suffering from chronic energy deficiency or thinness and (22.8%) are overweight. The assessment of nutritional status using indicator such as stunting, wasting and underweight and MUAC for children shows that (22.8%), (19.9%), and (26.5%) were severely stunted, wasted and underweight respectively. The correlation analyses show that literacy status of parents is one of the most important factor that affect the nutritional level of the under five children. Literacy status of parents and children underweight ( $r=.304$ ;  $p < .001$ ); stunting ( $r=.301$ ;  $p < .001$ ) and MUAC level ( $r=.179$ ;  $P = .037$ ). Children stunting level was found significantly associated with washing hand before feeding children ( $P=.003$ ). On the other hand, Underweight level of the children was found significantly associated with expenditure on food ( $P < .001$ ). Children wasting level was also found significantly associated with taking extra and nutritional food during pregnancy period ( $P=.037$ ). Considering these figures there is need for more nutritional education among mothers. Because an educated mother is most likely to provide better health care in term of good nutrition and better hygiene which will improve the nutritional status of the under five children. Awareness regarding household hygiene should be created with a little initiative by the government and NGOs in study area to save the future generation of Bangladesh.

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### **I. INTRODUCTION**

Malnutrition is one of the leading causes of morbidity and mortality in children under the age of five in the developing countries. It has been responsible, directly or indirectly, for 60% of the 10.9 million deaths annually among children under five (WHO, 2002)<sup>1</sup>. Malnutrition affects physical growth, morbidity, mortality, mental development, reproduction, and physical work capability, and it consequently impacts on human performance, health and survival. The prevalence of malnutrition in Bangladesh is the highest in the world. Millions of children in Bangladesh are suffered from one or more forms of malnutrition including low birth weight, wasting, stunting, and underweight. Severity of underweight, stunting and wasting was 10.9%, 19.0% and 2.9% respectively in the children (BBS & UNICEF, 2007)<sup>2</sup>. Malnutrition not only affects individuals but its effects are passed from one generation to the next. The immediate cause of malnutrition is insufficient micronutrients; in particular: vitamin A, iron, iodine, and zinc deficiencies. Broader causes of malnutrition include maternal malnutrition, poor quality health services, and insufficient infant feeding practices.

Malnutrition primarily affects poor children and women, especially in rural areas. The children residing in rural areas showed higher prevalence of underweight (57.8%), stunting (56.2%) and wasting (18.2%) compared to urban areas (respectively, 41.9%, 39.4 and 12.8%) (Mitra et al., 1997)<sup>3</sup>. Improving nutrition is essential to the continued development of our country, the expansion of a productive workforce, and overall economic growth. Proper nutrition will enhance physical and cognitive capabilities that will increase overall productivity and sustain economic expansion ((FAO, 2010)<sup>4</sup>. In order to achieve this goal, we must expand our efforts for our national vitamin A supplementation, iodine deficiency programs, and the National Nutrition Project, as well as further educate our citizens on healthy behaviors (UNICEF, 2010)<sup>5</sup>. Socio-economic determinants have a significant effect on the health outcomes of a mother's male and female children. The anthropometric measures for child nutritional status suggest that significant number of children in Bangladesh

still suffer from malnutrition, at present 43.2 percent of the children under 5 in terms of stunting are malnourished because they are shorter for their age, reflecting long term deprivation for food and nutrition; and nearly half (41 %) is so in terms of underweight because their weight is below that expected for their age. On the other hand, 17.4 percent of the under 5 in terms of wasting are malnourished. (Bangladesh Demographic and Health Survey, 2007)<sup>6</sup>. On the global perspective 195 million children under age five suffer from stunting (shortness for age) (UNICEF 2009)<sup>7</sup>, 26 million children under age five are severely wasted (too thin for their height) (UNICEF 2009)<sup>7</sup>. About 1.5 million children under age five die from wasting each year (WHO 2009)<sup>8</sup>.

As per available data about half of children in this age group suffer from different grades of malnutrition. Malnutrition in turn weakens the immune system of the child, thereby contributes to more than 50 % of deaths associated with infectious diseases among this age group. During preschool period child is mostly dependent on mother for all its nutritional needs. Hence it is argued that the mother being the major care provider for the child during preschool period, her status in the family may have bearing on nutritional status of her child. This research therefore tried to examine relationship between socio-economic determinants and nutritional outcomes of the children in Bangladesh

### Objectives of the Study:

#### A. General objective

The broad objective of this study to know and investigate the impact of socio-economic determinants on nutritional outcomes of the children in Bangladesh.

#### B. Specific objectives

1. To assess the role of care giver in the nutritional status of under five years' children.
2. To measure the nutritional status of the under five years' children.
3. To analyze the impact of household environment on the anthropometric indices of the under five children.
4. To analyze the impact of demographic factors on the anthropometric indices of the under five children.

## II. MATERIAL AND METHODS

The present study is explanatory in nature which explain the socio-economic determinants affecting nutritional outcomes of the children in Bangladesh. The study design was survey one and carried in 'Chandani Mahal' which is one of the most notable, industrialized and advanced village of Senhati Union of DighaliaUpazila under Khulna division of Bangladesh. Data were collected purposively from the child's mother and the children of under-five (0 to 59 months) year of age. Purposive sampling method was used to select 136 respondents. Data were collected through interview technique and analyzed by using the computer software program, IBM SPSS Statistics 20, MUAC Tape, Standing Machine for Weight Measurement, Steel Tape for Height Measurement and BMI calculator. On the other hand, Secondary data are collected from BBS, Books, Journals and daily newspapers, etc.

### Analysis of Anthropometric Measurements

The nutritional status of children under five is commonly assessed using three indices: weight-for-height (wasting) which reflects acute growth disturbances, height-for-age (stunting) which reflects long-term growth faltering and weight-for-age (underweight) which is a composite indicator of both long and short term effects. On the other hand, Mid-Upper Arm Circumstance (MUAC) is a measure of wasting or acute malnutrition. It is a measure of the diameter of the upper arm, and gauges both fat reserves and muscle mass.

	<b>Classification</b>	<b>Principal Cut-off Points</b>
<b>BMI Classification</b>	BMI < 18.5 BMI 18.5-24.5 BMI 25-30	Under Weight Healthy weight range Overweight (grade I obesity)
	BMI > 30-40 BMI > 40	Obese (grade II obesity) Very obese (morbid or grade III obesity)
	<b>Nutrition Indicator</b>	<b>Cut-off Points</b>
<b>MUAC Classification</b>	Normal	≥12.5cm
	Malnourished	≥11.5cm & < 12.5cm
	Severely Malnourished	<11.5cm
	<b>Estimated Health Risk</b>	<b>Cut-off Points</b>
<b>Wasting Categorization</b>	Normal	-2 < Z-Score < +2
	Moderate	-3 < Z-Score < -2
	Severe	Z-Score < -3

	Estimated Health Risk	Cut-off Points
<b>Underweight Categorization</b>	Normal	-2<Z-Score <+2
	Moderate	-3< Z-Score<-2
	Severe	Z-Score<-3
	Estimated Health Risk	Cut-off Points
<b>Stunting Categorization</b>	Normal	-2<Z-Score <+2
	Moderate	-3< Z-Score<-2
	Severe	Z-Score<-3

Source: (WHO, 2006)<sup>9</sup>

### III. RESULTS AND DISCUSSIONS

#### 1. Socio-demographic profile of the Respondents

Socio economic and demographic status refers to the overall social and economic activities of the people by which the people live on. It includes age, sex, education, income, family type, family head, and religious belief and so on of the people. All respondents of the study were divided into four age groups. Among them (63.2%) percent participants were 21 to 30 years, (21.3%) percent participants were 31 to 40 years. the mean age of those participant is about 28 years.

**Table 1. Background Information of the Child's Mother**

	Number of Respondents (N=136)	Percentage
<b>Age of the Child's Mother</b>		
10-20	16	11.8
21-30	86	63.2
31-40	29	21.3
41-50	5	3.7
	<i>Mean: 27.71</i>	<i>Std. Deviation: 5.97</i>
<b>Mother's Age at Marriage (in year)</b>		
10-15	24	17.6
16-20	101	74.3
21-25	10	7.4
26-30	1	.7
	<i>Mean: 17.26</i>	<i>Std. Deviation: 2.61</i>
<b>BMI of Child's Mother</b>		
Under Weight (< 18.5)	12	8.8
Healthy weight range (18.5-24.5)	84	61.8
Overweight (grade I obesity) (25-30)	31	22.8
Obese (grade II obesity) (>30-40)	9	6.6

Source: Field survey, 2014.

Minimum and maximum age of the respondents are respectively 17 years and 46 years. Age at marriage is the age at which a person is allowed to marry. Among 136 respondents of the present study (74.3%) percent participants age at marriage were 16 to 20 years and the mean age at marriage of those participant is about 18 years.

Overall nutritional status of (61.8%) percent mother is normal, that is, they have normal BMI (18.5-24.5) while (8.8%) percent mother is suffering from chronic energy deficiency or thinness (BMI <18.5) and (22.8%) percent women are overweight (grade I obesity) (BMI 25 to 30). On the other hand, (6.6%) percent women are Obese (grade II obesity) (BMI >30-40).

#### 2. Assessing the Nutritional Status of the Under 5 child

Most of the under five children (54.4%) percent was female and (45.6%) percent male in study area. the mean age of child was about 27 months during field visit.

**Table 2. Assessing the Nutritional Status of the Under 5 child**

	Number of RespondentPercentage (N=136)	
<b>Age (in month)</b>		
1-10	32	23.5
11-20	26	19.1
21-30	25	18.4
31-40	23	16.9
41-50	14	10.3
51-59	16	11.8
	<i>Mean: 26.08</i>	
<b>Categories of Wasting</b>		
Normal (-2<Z-Score <+2)	90	66.2
Moderate (-3< Z-Score<-2)	19	14.0
Severe (Z-Score<-3)	27	19.9
<b>Categories Underweight</b>		
Normal (-2<Z-Score <+2)	69	50.7
Moderate (-3< Z-Score<-2)	31	22.8
Severe (Z-Score<-3)	36	26.5
<b>Categories of Stunting</b>		
Normal (-2<Z-Score <+2)	66	48.5
Moderate (-3< Z-Score<-2)	39	28.7
Severe (Z-Score<-3)	31	22.8
<b>Mid-Upper Arm Circumstance (MUAC)</b>		
Normal (≥12.5cm)	113	83.1
Malnourished (≥11.5cm &< 12.5cm)	21	15.4
Severely Malnourished (<11.5cm)	2	1.5

Source: Field survey, 2014.

The prevalence of severe wasting (Z-Score<-3), moderate wasting (-3< Z-Score<-2) and normal (-2<Z-Score <+2) was (19.9%) percent, (14.0%) percent and (66.2%) percent respectively. Wasting may be the consequence of starvation or severe disease. Severe wasting is closely linked to mortality risk. The prevalence of severe underweight (Z-Score<-3) and moderate underweight (-3< Z-Score<-2) was (26.5%) percent and (22.2%) percent respectively. On the other hand, the prevalence of severe stunting (Z-Score<-3), moderate stunting (-3< Z-Score<-2) and normal (-2<Z-Score <+2) was (22.8%) percent, (28.7%) percent and (48.5%) percent respectively.

Mid-Upper Arm Circumstance (MUAC) is a measure of wasting or acute malnutrition. MUAC is a measure of the diameter of the upper arm, and gauges both fat reserves and muscle mass. The prevalence of Severely Malnourished (<11.5cm), Malnourished (≥11.5cm &< 12.5cm) and Normal (≥12.5cm) was (1.5%) percent, (15.4%) percent and (83.1%) percent respectively.

### 3. Social Determinants of Child Health

The social determinants of child health are the conditions in which children are born, grow, and live, including the health system. These circumstances are shaped by the distribution of money, power and resources. Most of the household parents (71.3%) percent are both literate, one literate is 1(9.9%) percent. On the other hand, (8.8%) percent household both father and mother are illiterate.

**Table 3. Social Determinants of Child Health**

	Number of RespondentPercentage (N=136)	
<b>Literacy Status of Parents</b>		
Both literate	97	71.3
One literate	27	19.9
Both illiterate	12	8.8
<b>Source of Drinking Water</b>		
Tube-well	134	98.5
Deep tube-well	2	1.5
<b>Kind of House</b>		
Pucca	44	32.4

Semi- Pucca	26	19.1
Mud	7	5.1
Teen shed	59	43.4
<b>Place of Impounding Daily Trash</b>		
In open place	74	54.4
In front of house	30	22.1
In any place randomly	2	1.5
In a fixed place	30	22.1

Source: Field survey, 2014.

During field survey it is found that about (37%) percent use *Kutcha* latrine, (30.9%) percent use *pukka* latrine and (32.4%) percent household are using sanitary latrine (Non water sealed). On the other hand, (98.5%) percent households use tube-well as their source of drinking water. (54.4%) percent households dispose their daily trash in an open place, (22.1%) percent respondents impound their daily trash in front of their house and (22.1%) percent households properly dispose their daily household produced trash in a fixed place.

#### 4. Economic Determinants of Child Health

Most of the child's fathers was factory labor (55.1%) percent because the study area is an industrial area and maximum men are involved in jute industries. Service holder was (18.4%) percent, farming and rickshaw puller was (5.9%) percent and (6.6%) percent of the total respondents respectively. (9.6%) percent child's father occupation was trade and business and only (4.4%) percent child father stay in foreign for their occupation.

Among 136 households (54.4%) percent households have the income between 5001 -10,000. The second largest group (36.0) percent belong to 1000-5000 income level. The mean income of the family is 7375 and mode of the income level is 5000. On the other hand, (99.3%) percent of the child's mother said that their occupation is house wife and from the present study it is found that only (0.7%) percent child's mother occupation is day labor.

It is also found from the study that among 136 households most of the households (59.6%) percent expend their income to meet up food, (28.7%) percent families expend their major partitions of income on clothing, medical treatment. On the other hand, only (2.2%) percent and (9.6%) percent expend major portion of their income for non-food and durables assets respectively.

**Table-4: Economic Determinants of Child Health**

	Number of Respondent (f)	Percentage (%)
<b>Occupation of the Child's Father</b>		
Rickshaw Puller	9	6.6
Factory labor	75	55.1
Farming	8	5.9
Service holders	25	18.4
Trade and business	13	9.6
Others (Stay in foreign country)	6	4.4
<b>Occupation of the Child's Mother</b>		
House wife	135	99.3
Day labor	1	.7
<b>Monthly Income of the Family (in BDT)</b>		
1000-5000	49	36.0
5001-10,000	74	54.4
10,001-15,000	7	5.1
15,001-20,000	3	2.2
20,000-35,000	3	2.2
Mean: 7375	Mode: 5000	Std. Deviation: 5053
<b>Major Items of Expenditure</b>		
Food	81	59.6
Non-food	3	2.2
Clothing, medical and other	39	28.7
Durables	13	9.6

Source: Field survey, 2014.

### 5. Hygiene and health practices

On the (multiple responses) responses of respondents regarding when usually they are washing their hands. At this point, most responses were recorded on after eating (136), after that, after coming from toilet (120), then after cleaning children (44), after that before eating (7) and then before feeding food to child only (5) responses.

Present study found that among 136 household mother (45.6%) percent are washing their hands with soap, (38.2%) percent with only water and (16.2%) percent with clay or ash.

The health service facilities are very low in the study area among 136 respondents (85.3%) percent respondents received their medical treatment from nearby government health care mainly community clinic and second majority (9.6%) percent received homeopath. Only (0.7%) percent respondent received their treatment from qualified allopath physician.

**Table-5: Pattern of Hand Washing**

	Responses	Percent of Cases
<b>Washing Hand</b> (Multiple responses )		
Before eating	7	5.1%
After eating	136	100.0%
After coming from toilet	120	88.2%
In the time of handling food items	5	3.7%
After cleaning children	44	32.4%
Before feeding food to child	5	3.7%
<b>Washing Hands With</b>		
	<b>Number of Respondent (N=136)</b>	<b>Percentage (%)</b>
Soap	62	45.6
Clay/ash	22	16.2
Only water	52	38.2
<b>Usually Taken Treatment</b>		
Government health care	116	85.3
Non-govt. health center	4	2.9
Qualified allopath physician	1	.7
Homeopath	13	9.6
Hekimi/ kabiraji	2	1.5

*Source: Field survey, 2014.*

### 6. Feeding Practice

Breastfeeding of infants is an essential health and medical decision for both the mother and her baby. Breastfeeding results in significant health gain, obesity reduction and cost saving to society (ProthomAlo, 2009)<sup>10</sup>.

**Table -6: Duration of Breast Feeding for the Last Child Who's Age up to 60 Months**

Duration of Breast Feeding for the Last/ Last but Youngest Child	Number of Respondent (f)	Percentage (%)
Less than 4 months	11	8.1
4-6 months	17	12.5
More than 6 months	14	10.3
9-12 months	31	22.8
1-2 years	37	27.2
2 years & over	26	19.1
<b>Total</b>	<b>136</b>	<b>100.0</b>

*Source: Field survey, 2014.*

Table-6 provides the information that majority of the respondents (27.2%) percent continued breast feeding to their babies for 1 to 2 years. About (23%) percent of the respondents continued breast feeding for 9 to 12 months. (19.1%) percent respondents continued breast feeding for 2 years & over. (8.1%) percent, (12.5%) percent and (10.3%) percent for less than 4 months, 4 – 6 months and more than 6 months respectively.

### 7. Perception test of the respondent regarding what Factors affecting under five child nutrition

The perception test of the respondent regarding what factors affecting under five child nutrition conducted by using Likert scaling which was based on 7 statements. They are:

1. Less family income affects under five child nutrition.

2. Low parental education lever has important effect on under five child nutrition.
3. Partially vaccinated against diseases have serious destructive output on under five child nutrition.
4. Not taking extra care and nutritional food during pregnancy period have negative effect on under five child nutrition.
5. Not Going to doctor for checkup during pregnancy period affects under five child nutrition.
6. Not Breast feeding up to 6 months affects under five child nutrition.
7. House with poor ventilation and overcrowding affects under five child nutrition.

On the basis of these statements respondent's perception has been collected through 5 degrees of Likert scaling (Kothari, 2011)<sup>11</sup>. They were numbered with five different numerical values chronologically.

They are:

- i. Strongly agree (1)
- ii. Agree (2)
- iii. Undecided (3)
- iv. Disagree (4)
- v. Strongly disagree (5)

These 7 statements with 5 degrees represent the main view of respondents, factors affecting under five child nutritional status. The total score was divided by total respondents and the average score was 14.926. As like:

$$\text{Average Likert scaling score} = \frac{\text{Total score}}{N} = \frac{2030}{136} = 14.926$$

In this scaling, the scoring can be present in this way:

- vi. Most favorable = 7 (statements) × 1 = 7
- vii. Moderately favorable = 7 (statements) × 2 = 14
- viii. Neutral = 7 (statements) × 3 = 21
- ix. Moderately unfavorable = 7 (statements) × 4 = 28
- x. Most unfavorable = 7 (statements) × 5 = 35

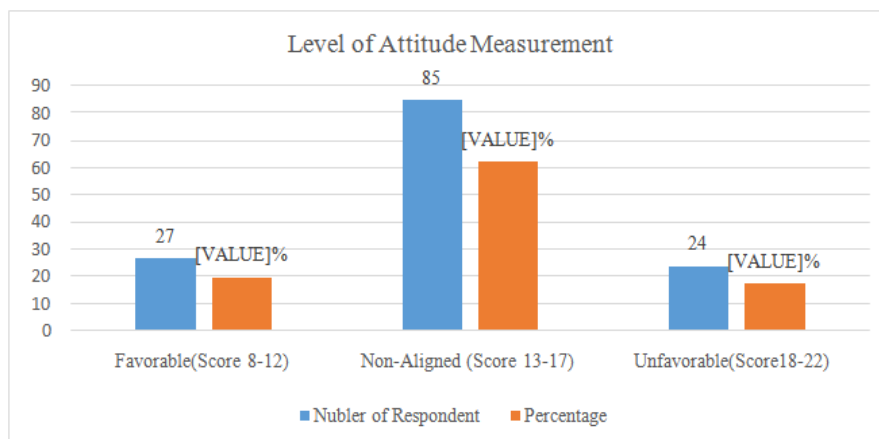
**Table-7: Comparison between Expected and Actual Likert Scaling Score**

Value	Level	Score
Expected	Lowest	7
	Highest	35
Actual/observed	Lowest	8
	Highest	21

Source: Field survey, 2014

Among 136 respondents, the lowest individual score was expected 7 and the highest individual score was expected 35 (though highly biased) but in the study area in was found that the lowest individual score was 8 and the highest individual score was 21. But the average score of 136 respondents is 14.926. So, it can be said that respondents are in a moderately favorable position considering the factor that affects under five children's nutritional status. Because the score 14.926 is cross the moderate favorable score lightly but not more or equal to 21.

**Chart-1: Level of Attitude Measurement**



Source: Field survey, 2014

The above chart-1 shows the result of summated rating scale. Among 136 respondents the highest (62.5%) percent stood in non-aligned level according to their responded score while (17.65%) percent respondents had the unfavorable degree of perception. Though in the interview schedule there were five scales namely, strongly agree, agree, neutral/undecided, and strongly disagree; however; for the purpose of further analysis and presentation that five scales were converted and recoded into three categories (scale) namely favorable, non-aligned, unfavorable which is also used in this scaling method. But the average score of 136 respondents is 14.926. So, it can be said that respondents were in a neutral (non-aligned) position considering different nutritional issues that means their perception is very considerable and they were not so indifferent about under five children nutritional issues.

### 8. Testing Chi-square Test of Independence Hypotheses

Test no.1 presents the probability of the chi-square test (chi-square=24.050) was Monte Carlo  $p=.017$ , less than or equal to the alpha level of significance of 0.05. The research hypothesis that differences in “child’s stunting level” are related to differences in “level of mother education” is supported by the analysis.

**Table-8: Testing Chi-square Test of Independence Hypotheses**

S No.	Test Conducted	Independent Variable	Dependent Variable	Calculated Value	df	Monte Carlo Sig. (2-sided)
1.	Pearson’s $\chi^2$	Education lever of the child’s mother	Level of stunting	24.050	12	P=.017
2.	Pearson’s $\chi^2$	Going to Doctor for Checkup During Pregnancy Period	Level of stunting	7.730	2	P=.021
3.	Pearson’s $\chi^2$	Mother’s Body Mass Index (BMI)	Level of wasting	10.514	6	P=.101
4.	Pearson’s $\chi^2$	Major items of Expenditure	Level of underweight	27.485	6	P< .001
5.	Pearson’s $\chi^2$	Type of attendant	Level of Mid-Upper Arm Circumstance (MUAC)	11.941	4	P=.013

Source: Field survey, 2014

Test no.2 presents the probability of the chi-square test (chi-square=7.730) was  $p=.021$ , less than or equal to the alpha level of significance of 0.05. The research hypothesis that differences in “child’s stunting level” are related to differences in “affinity for going to doctor during pregnancy” is supported by the analysis. Test no.3 presents there is direct relationship between healthy (18.5-24.5) BMI of mother and normal the weight for length (wasting) of the under five children. The research hypothesis that differences in “child’s wasting level” are related to differences in “mother’s BMI” is not supported by this analysis. The probability of the chi-square test (chi-square=10.514) was Monte Carlo  $p=.101$ , greater than the alpha level of significance of 0.05.

Test no.4 presents the probability of the chi-square test (chi-square = 27.485) was Monte Carlo  $p<.001$ , less than or equal to the alpha level of significance of 0.05. The research hypothesis that differences in “child’s underweight level” are related to differences in “monthly expenditure on food” is supported by the analysis. Test no.5 The probability of the chi-square test (chi-square=11.941) was Monte Carlo  $p=.013$ , less than or equal to the alpha level of significance of 0.05. The research hypothesis that differences in “MUAC level of the child” are related to differences in “attendant of ordinary *dai*” is supported by this analysis.

### 9. Test of Pearson Correlation

The correlation analyses show that literacy status of parents is one of the most important factor that affect the nutritional level of the under five children. Literacy status of parents and children underweight ( $r=.304$ ;  $p<.001$ ); stunting ( $r=.301$ ;  $p<.001$ ) and MUAC level ( $r=.179$ ;  $P=.037$ ).

**Table-9: Result of Correlation Analysis**

Sl. No.	Test Conducted	Independent Variable	Dependent Variable	Value	Sig. (2 tailed)	No of Respondents
1.	Pearson’s Correlation (R)	Literacy status of parents	Weight-for-age (WFA)	.304**	$p<.001$	136



2.	Pearson's Correlation (R)	Literacy status of parents	Length-for-age (LFA)	.301**	$p < .001$	136
3.	Pearson's Correlation (R)	Literacy status of parents	Mid-Upper Arm Circumstance (MUAC)	.179*	$P = .037$	136
4.	Pearson's Correlation (R)	Age at marriage	Mother's weight	.226**	$p < .001$	136
5.	Pearson's Correlation (R)	Mother's age at first birth	Number of children	-.318**	$p < .001$	136

\*. Correlation is significant at the 0.05 level (2-tailed).  
\*\*. Correlation is significant at the 0.01 level (2-tailed).

*Source: Field survey, 2014*

The correlation between the Age at marriage of mother and Mother's weight of mother was significant, ( $r = .226, p < .001$ ). It is also found that there is a correlation between the Mother's age at first birth and Number of children, ( $r = -.318, p < .001$ ).

### RECOMMENDATIONS

The results of this study suggest that the following recommendations be made in other to improve health and nutritional status of under five children with a little initiative by the government and NGOs in the present study area.

1. Exclusive breastfeeding should be encouraged among the mothers.
2. Government and non-government organization should work in increasing awareness on different maternal and child health issues.
3. There is need for more attention on feeding and hygienic practices, easy access to pure drinking water.
4. Awareness regarding household hygiene should be created with a little initiative by the government, NGOs in study area.
5. Door to door health service should be provided in the help of health service workers. Free or subsidized primary and secondary education for females is imperative.
6. Nutrition education of the masses needs to be intensified to encourage a healthy lifestyle.
7. Community clinics should be improving in rural area so that they can easily access to health service facilities.

### IV. CONCLUSION

The high levels of malnutrition in the present study underline the great need for nutritional intervention. Timely introduction of appropriate complementary feeding is a key factor in child growth. The results of this work indicated that mothers introduced the children complementary food too early in life which may adduce to be a major contributory factor for the high incidences of under nutrition observed in this study. Therefore, the most urgent priority is to ensure access to, improve the quality and proper timing of complementary foods which should be given to the children as from six months old. The assessment of nutritional status using indicator such as stunting, wasting and underweight and MUAC for children shows that (22.8%) percent, (19.9%) percent, and (26.5%) percent were severely stunted, wasted and underweight respectively and this may be as a result of poor breastfeeding and complementary practices, low education of mothers and poor economic status of the parents. The correlation analyses show that literacy status of parents is one of the most important factor that affect the nutritional level of the under five children. Literacy status of parents and children underweight ( $r = .304; p < .001$ ); stunting ( $r = .301; p < .001$ ) and MUAC level ( $r = .179; P = .037$ ). Nutrition education is the most sensitive factor that is needed by all mothers because this will keep them informed about the right food for them and their children at different stages of life and from there better living can be assured that will give the assurance of a better nutritional status for mothers and their children.

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