Study on Stunting of 6 - 59 Months Children and Factors Associated within, Gardez City, Paktia Province, Afghanistan

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Abstract

Evidence about risk factors of Stunting is useful to design appropriate policies and strategies to control health problems. A cross-sectional study was conducted among children aged 6-59 months in Paktia Regional Hospital. A total of 400 children were included in the study. Data were collected using a structured questionnaire and anthropometric measurement. The interview was conducted with parents/caretakers of the children to fill the questionnaire. SPSS version 25.0 statistical software was used for analysis. Cross tabulation and Logistic regression analyses were conducted to identify factors associated with the nutritional status of the children Statistical association was declared significant if the p-value was less than 0.05. The prevalence of Stunted was 41%. Variables; Gender, Family size, Number of children under 5, Life status of parents, Father's educational level, Mother's educational level, Annual income status, Food items do you feed to children, Awareness about weaning and supplementary food, Awareness about malnutrition, Age Weaning food should be started, Breast-feed status, period of time to feed breast, Food during Pregnancy, Status of immunity, Vaccinated during pregnancy, The age gap between babies and mothers' malnutrition (MUAC) status are statistically associated with Stunting. Height for age (stunted) is high among children aged 6–59 months in Gardez Town. Lack of awareness on malnutrition and child feeding, maternal nutrition status, family size, family income, and the age gap between babies are risk factors of malnutrition. Thus, therefore, the concerned bodies must design policies, which can improve the livelihood of households, works on information dissemination using mass media about malnutrition, weaning, and supplementary foods, and family planning and on meals during pregnancy.

Keywords: Under nutrition; Stunting; children, Gardez.

Introduction

Under nutrition represents insufficient intake of energy and nutrients satisfy people must maintain healthiness. In most literature, under nutrition is used synonymously with malnutrition (1). Under nutrition includes being underweight, stunted, and wasted and deficient in vitamins and minerals(2). Under nutrition makes children in particular much more vulnerable to disease and death (3).

Malnutrition is a global problem as millions of people are suffering from different forms of malnutrition, among children, 52 million under-fives are suffering from wasting, where they have a low weight for height, around one in ten children are born with low birth weight, and approximately 45 % of deaths among children under five are linked to under nutrition. (4) Furthermore, approximately 165 million children under five are stunted and more than half of them live in South Asia. Under nutrition totally accounts for the cause of 45 percent of all child deaths, and the prevention of stunting would increase at least 11% to GDP in South Asia. (5) Stunting is thought to be an indicator of chronic or long-term nutritional inadequacy, while wasting is usually assumed to reflect an acute situation related to illness or lack of food. (6)

Afghanistan is still among the lowest-ranked countries on UNDP's Human Development Index, at 168 out of 189 nations.

The total population of Afghanistan is 35.5 million (UNDP 2019). Overall survey results suggest that 36.6% of all children under the age of five are stunted in Afghanistan (height for age z-score below -2SD) and 17.3% are severely stunted (z-score below -3SD) (Afgh health survey 2018).(7) Afghanistan has one of the world's highest rates of stunting in children under the age of five: 41 percent. Stunting is a sign of chronic under nutrition during the most critical periods of growth. It prevents children from reaching their potential. Stunted children are more likely to contract diseases, less likely to get basic health care, and do not perform well in school. In Afghanistan Chronic, nutritional deficiency is largely due to poor feeding. In Afghanistan, feeding practices and poor eating that start from the earliest days of life are the main cause of poor nutrition. Though breast milk contains all the nutrition babies need for the first six months of life, only half of women practice exclusive breastfeeding for children in this age group (Demographic Health Survey DHS 2015). (8)The WHO, UNICEF, World Bank global, and regional child malnutrition predicts shows that we are still far behind from a world without malnutrition. The joint gauges, published in March 2019, cover indicators of stunting, severe wasting among children under five, wasting, and uncover insufficient progress to attain the Sustainable Development Goals set for 2030 and World Health Assembly goal set for 2025.

However, no single study has been conducted so far at Gardez Town to investigate the impact of socio-economic, demographic, and health-related determinants on high rates of under nutration observed among under-five children. It is for this reason that this study sought to investigate the factors influencing the condition of under nutration among children under 5 years of age in Gardez Town.

Literature Review

Under nutrition continues to be a major health burden in the world, particularly in developing countries. (2, 9, 10)

Under nutrition is a major public health problem in developing countries for children under five year. Under nutrition is a group of disorders that includes stunting, wasting, and underweight.

From literature, under nutrition is associated with faltered growth, delayed mental development, and reduced intellectual capacity. They can also no longer sustain natural bodily capacities, such as resisting infections and improving from the disease. (13, 14)

Improving the growth and development of children accelerates the economic growth and development of nations. (15)

Afghanistan faces serious food security problems, with 28 percent of Afghan households having inadequate caloric intake and at least a third of households consuming diets with inadequate food diversity, according to national surveys(16)

The majority of child morbidity and mortality is due to malnutrition (17, 18). The synergistic relation between malnutrition and infection is well known, and nutritional interventions have been recognized as an important approach for reducing mortality from acute respiratory illness and diarrhoea. (19) Children who suffer from chronic under nutrition in the early stages of life fail to grow and develop to their full potential, both mentally and physically. (20)

The consequences of chronic under nutrition on cognitive development and ensuing adult productivity are preventable if early interventions are implemented. (21) The effectiveness of efforts to improve infant and young child (IYC) nutrition depends on several factors, including information about family behaviours and the community environment. (22) While Afghanistan has made progress in improving the nutritional status of children and women, rates of under-nutrition, stunting, and wasting remain among the highest in the world, requiring attention to address immediate and underlying causes. (23)

The data from the 2015 AfDHS show that there has been a decline in the under-5 mortality rate. The rate was 87 deaths per 1,000 live births in the 10-14 years before the survey, falling to 55 deaths per 1,000 live births in the 5 years preceding the survey.

Based on information from the vaccination card and mothers' recall, 46% percent of children age 12-23 months had received all basic vaccinations by the time of the survey 2015 AfDHS). (24) Database of Systematic Reviews An adequate diet that includes the required macro-and micronutrients helps ensure human growth, physical and cognitive development, and a healthy immune system. (25)

Stunting, wasting, and underweight among under-five children account for 22.2%, 7.5%, and 13.5% respectively globally. From 1990 to 2017 Stunting and underweight declined by 43.5% to 45.8% globally. However, decreasing is not uniform in all parts of the world. Ninety percent of the children suffering from under nutrition resides in Asia and Africa. While Asia made encouraging strides in decreasing stunting from 47% in 1990 to 24% in 2016, Africa did not show a satisfactory reduction, 42% in 1990 to 33% in 2016. These disproportional reductions could be more challenging to achieve the Sustainable Development Goals aimed to be achieved by the year 2030. (26, 27)

Optimal growth and development in early childhood are determined by a complex interplay of a child, maternal, household, environmental, and socioeconomic factors that influence nutritional intake, but interventions to reduce child under nutrition sometimes target specific risk factors in isolation. (28)

Methods

The study was conducted at the Paktia Regional Hospital (PRH). it is located in the middle of Paktia, Gardez town. Gardez found in the eastern part of Afghanistan and serves more than 103,601 people. The hospital has a nutrition section together with other departments.The survey was conducted to assess 6-59 months aged children's nutrition status and its associated factors. Data was collected through a questionnaire and anthropometric measurements. The interview was conducted with the parent takers of the kids to complete the questionnaire. Nutritional Anthropometry has been conducted on 6-59 months aged children. In children aged 6-59 months, Protein Energy Malnutrition is usually most prevalent and most severe.The study population was all children aged 6–59 months attending PRH from January 19/ 2020 to March 10/2020 and live in Gardez town.All 6-59 months aged children were checked by nurses and doctors and 400 malnutrition children were considered in this study.. Stunting is a dependent variable and Socio-economic and demographic variables of parents (Family Size, Number of Children, Number of Children Under 5, Life Status of Parents, Father's Educational Level, Mother's Educational Level, Annual Income, Status of House), Child characteristics (Gender, Age, Number of children, Number of children under five years sex, the age gap between children), Practices child care (Feedings), Maternal characteristics (MUAC, age during the marriage, vaccination during pregnancy, feeding status) and Environmental health

condition (water supply, housing condition) are independent variables.Data analysis was made using a spreadsheet and SPSS 25.0 statistical Package. We used descriptive statistics, cross-tabulation, and binary logistic regression models for analysis and identify the statistical association between dependent and independent/explanatory variables. Before using binary logistic regression, bivariate analysis was done for the dependents variable: Height for age (stunted). The independent variables with a strong Pearson correlation coefficient during bivariate analysis were selected as a candidate for multivariable analysis. Binary logistic regressions were fitted by using the Forward elimination technique to identify determinants of Height for age (stunted).

Results

3.1 Prevalence of stunting

Figure 3.1 shows that the prevalence of stunting in children. This study shows that 41% of children had stunting in my country.
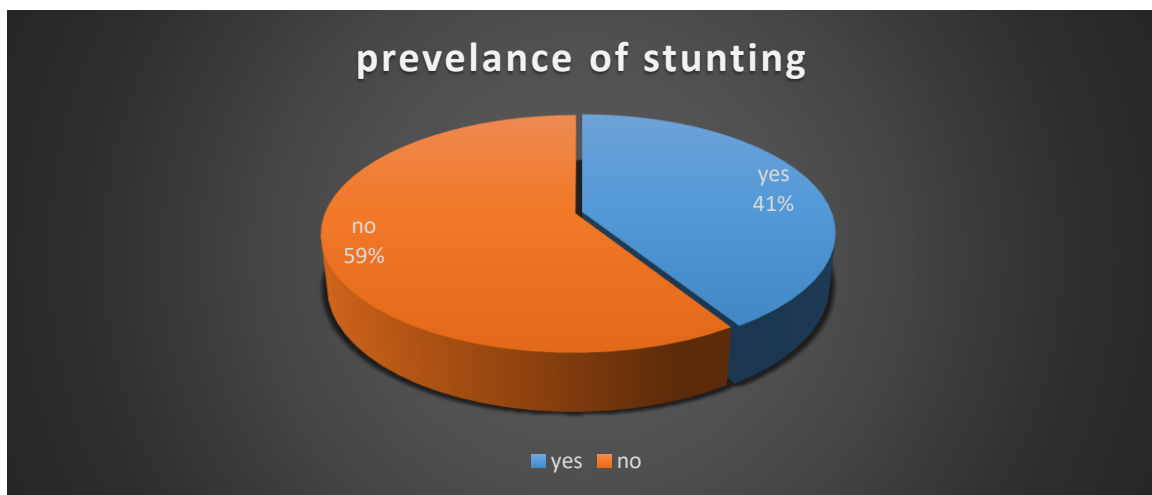

Figure 3.1 Pie-chart showing the Prevalence of stunting.

3.2 Prevalence of stunting by Gender Wise

Figure 3 shows the prevalence of the nutritional status of male and female children. Findings showed that 38.6% of the male children were stunted, Likewise, 42.6% of the female children were stunted.
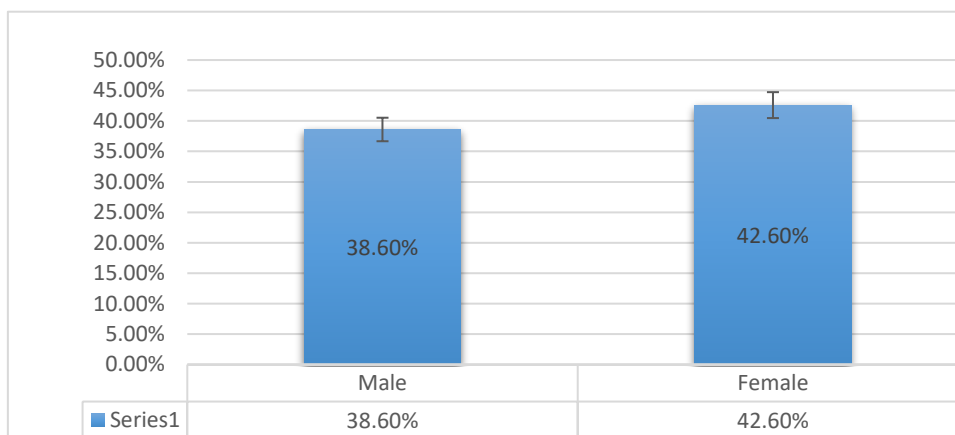
Figure 3.2 Nutritional status of male and female 6-59 months aged children

3.3 Association between stunting and different variables

Table 3.1 shows the association between Height for age (Stunted) and different variables. To find the association between variables, the chi-square test was applied. Statistically significant variables in stunted are: Family size, Number of children under 5, Life status of parents, Father's educational level, Mother's educational level, Annual income status, Food items do you feed to children, Awareness about weaning and supplementary food, Awareness about malnutrition, Age Weaning food should be started, Breast-feed status, Period of time to feed breast, Food during Pregnancy, Status of immunity, Vaccinated during pregnancy, The age gap between babies and MUAC Mother. But variables; Total number of children, Status of House, Mother's married age, and Which water to use are not statistically significant to Height for age (stunting).

The result shows that in some families 11-15 and greater than 20 95.4 and 86.8% of children are stunted respectively. But in the small number of family size, 96.6% of children are not stunted. Similarly, from families who have more than two under-five children, 84.7% are stunted. Oppositely, there is less percentage of stunting in the small number of underweight children households. I.e. from families who have 1 under 5 children, 78.9% are not stunted. Regarding the father's and mothers educational status, the result shows that children from non-educated families are more stunted than educated families. From insufficient income status, 84.5 % of children are stunted but children from sufficient income status families are only 19.7 % stunted. Regarding the feeding status of children, feeding Meat/Milk/Rice/bean/potato/sugar, vegetables has a small percentage of stunting (only 9.8% of children are stunting from feeding this food group). Children from families who do not know about weaning and supplementary foods 87.6% are stunted. Similarly, children from families who have awareness about malnutrition

26.8% are stunted but children from non-aware families 69.1 % are stunted. The result shows, children starting weaning food at age 7 months and above 7 months shows 69.7% and 78.1% respectively are not stunted. Children who not feed breast are 94.9% are stunted. Similarly, but with narrow share, from total breastfeeding children 61.5% are stunted and 38.5 are not stunted. From mothers who have vaccines during pregnancy, 46.5% are stunted and from mothers who have no taken vaccination, 85.9% are stunted. The result shows increasing the age gap between babies will decrease the percentage of stunted children. From the 1-year age gap, 80.9 % are stunted and from 4 year age gap only 5.3% are stunted.

Table 3.1 Association between Height for age Stunted) and different variables

Variables		Height for age (stunted)		Chi-Square	P-Value
		Yes	No		
Gender	Male	98 71.50%	39 28.50%	4.2	0.046
	Female	161 61.20%	102 38.80%		
Family size	<6	3 3.80%	77 96.30%	313.363	0.000
	6-10	11 16.40%	56 83.60%		
	11-15	103 95.40%	5 4.60%		
	16-20	61 96.80%	2 3.20%		
	>20	81 98.80%	1 1.20%		
Number of Children	<3	82 63.60%	47 36.40%	0.918	0.632
	6-Mar	135 66.80%	67 33.20%		
	>6	42 60.90%	27 39.10%		
Number of Children Under 5	1	26 21.10%	97 78.90%	148.048	0.000
	2	117 83.60%	23 16.40%		
	>2	116 84.70%	21 15.30%		
		62.60%	37.40%		

Continued-Table 3.1 Association between Height for age Stunted) and different variables

Variables		Height for age (stunted) Yes	No	Chi-Square	P-Value
Life Status of Parents	Both Alive	229	137	9.311	0.025
	Both Dead	62.60%	37.40%	62.60%	37.40%
		8	1	8	1
	Mother is Dead	88.90%	11.10%	88.90%	11.10%
		9	2	9	2
	Father is Dead	81.80%	18.20%	81.80%	18.20%
		13	1	13	1
Father's Educational Level	None	233	27	250.016	0.000
		89.60%	10.40%		
	Elementary	11	1		
		91.70%	8.30%		
	Intermediate	7	4		
		63.60%	36.40%		
	High School	2	27		
		6.90%	93.10%		
	Higher Education	5	82		
		5.70%	94.30%		
	Religious	1	0		
		100.00%	0.00%		
Mother's Educational Level	None	257	110	54.677	0.000
		70.00%	30.00%		
	Elementary	1	21		
		4.50%	95.50%		
	High School	1	5		
		16.70%	83.30%		
	Higher Education	0	5		
		0.00%	100.00%		

Continued-Table 3.1 Association between Height for age Stunted) and different variables

Variables		Height for age (stunted) Yes	No	Chi-Square	P-Value
Is total annual income sufficient for family living?	Yes	24	98	156.28	0.000
		19.70%	80.30%		
	No	235	43		
		84.50%	15.50%		
Status of House	Own	169	91	3.378	0.497
		65.00%	35.00%		
	Rent	73	46		
		61.30%	38.70%		
	Lease	1	0		
		100.00%	0.00%		
	Living with Others	15	4		
		78.90%	21.10%		
	Immigrant Camp	1	0		
		100.00%	0.00%		
Mother Married Age	14-18 Year	173	109	7.21	0.066
		61.30%	38.70%		

19-22 Year	81	29		
	73.60%	26.40%		
23-26 Year	5	2		
	71.40%	28.60%		
26-30 Year	0	1		
	0.00%	100.00%		

Continued-Table 3.1 Association between Height for age Stunted) and different variables

Variables		Height for age (stunted)		Chi-Square	P-Value
		Yes	No		
What food items do you feed to your children/baby	Milk	74	36	173.444	0.000
		67.30%	32.70%		
	Milk/Rice/Bean/ Potato/Sugar /Vegetable	83	7		
		92.20%	7.80%		
	Meat/Milk/Rice/Bean/Potato/ Sugar, Vegetable	9	83		
		9.80%	90.20%		
	Rice/Bean/Potato/Sugar, Vegetable	93	15		
		86.10%	13.90%		
Do you know about weaning and supplementary food	Yes	111	120	66.791	0.000
		48.10%	51.90%		
	No	148	21		
		87.60%	12.40%		
Do you know what malnutrition is?	Yes	11	30	28.781	0.000
		26.80%	73.20%		
	No	248	111		
		69.10%	30.90%		
At which age Weaning food should be started	4 Month	1	0	102.237	0.000
		100.00%	0.00%		
	5 Month	45	2		
		95.70%	4.30%		
	6 Month	117	30		
		79.60%	20.40%		
	7 Month	10	23		
		30.30%	69.70%		
	8 Month and Above	14	50		
		21.90%	78.10%		

Continued-Table 3.1 Association between Height for age Stunted) and different variables

Variables		Height for age (stunted)		Chi-Square	P-Value
		Yes	No		
Do you breast-feed the baby from day of birth	Yes	222	139	17.178	0.000
		61.50%	38.50%		
	No	37	2		
		94.90%	5.10%		
For how long feed breast	<3 months	100	21	25.671	0.000
		82.60%	17.40%		
	3-6 months	48	29		
		62.30%	37.70%		

		Yes	No		
	>6 months	111 55.00%	91 45.00%		
What was your food when you were Pregnant?	Rice/Vegetable/Fruits/Bean/Potato (Vegetarian)	238 82.10%	52 17.90%		
	Rice/meat, Vegetable/Bean/Potato,Fruit , Meat (Non Vegetarian)	21 19.10%	89 80.90%		
Is your child being immunized	Yes	223 79.60%	57 20.40%	90.697	0.000
	No	36 30.00%	84 70.00%		
Are you being vaccinated during pregnancy?	Yes	100 46.50%	115 53.50%	67.749	0.000
	No	159 85.90%	26 14.10%		

Continued-Table 3.1 Association between Height for age Stunted) and different variables

Variables		Height for age (stunted)		Chi-Square	P-Value
		Yes	No		
Which water do you use?	Filtration	3 100.00%	0 0.00%	1.915	0.590
	River	8 66.70%	4 33.30%		
	Tap	10 58.80%	7 41.20%		
	Well	238 64.70%	130 35.30%		
What is the age gap between babies?	1 Year	144 80.90%	34 19.10%	109.161	0.000
	2 Year	79 76.70%	24 23.30%		
	3 Year	18 24.30%	56 75.70%		
	4 Year	1 5.30%	18 94.70%		
MUAC Mother (malnourished)	Yes	117 86.70%	18 13.30%	55.722	0.000
	No	78 45.30%	94 54.70%		

3.4 Binary logistic regression

The presence of multi-collinearity within the set of independent variables for stunted was determined by using the variance inflation factor. Here all variance inflation factors were less than ten so, there doesn't exist multi-collinearity between independents variables. Before using binary logistic regression, bivariate analysis was done for dependents variable Height for age (stunted). The independent variables with a strong Pearson correlation coefficient during bivariate analysis were selected as the candidate for binary

logistic regression analysis. Binary logistic regressions were fitted by using the Forward elimination technique to identify determinant of Height for age (stunted).

Height for age (stunted)

Binary logistic regressions were used for statistically significant variables. Table 3.4 shows the output of the logistic regression of Height for age (stunted) for different characteristics. The result shows that Children from a household that have two number of children were 11.664 (with 95% CI = 3.636 to 37.414) times stunted as compared to those children from a household that have more than two number of children and children from a household that has one number of children were 1.531 (with 95% CI = 0.659 to 3.556) times as compared to those children from a household that have more than two number of children. But this result was found to be statistically insignificant (p-value = 0.322). Children from the family who have sufficient annual income were 0.105 times (with 95% CI = 0.038 to 0.290) stunted as compared to those children from a family who have no sufficient annual income. This shows increase sufficient income will decrease stunting. Children from families who have awareness about weaning and supplementary food were 0.344 times (with CI = 0.152 to 0.777) stunted as compared to those children from families who have no awareness about weaning and supplementary food. Children from malnourished mothers were 16.377 times (with CI = 6.157 to 43.562) stunted as compared to children from mothers who are not malnourished (well-nourished).

Table 3.4 Logistic regression of Height for age (stunted) for different characteristics

	B	S.E.	Df	Sig.	OR	95% C.I.for OR Lower	Upper
Number of Children Under 5							
>2 (Ref.)							
2	2.456	0.595	1	0.000	11.664	3.636	37.414
1	0.426	0.430	1	0.322	1.531	0.659	3.556
Is total annual income sufficient for family living?							
No (Ref.)							
Yes	-2.258	0.520	1	0.000	0.105	0.038	0.290
Do you know about weaning and supplementary food							
No (Ref.)							
Yes	-1.067	0.416	1	0.010	0.344	0.152	0.777
MUAC Mother (malnourished)							
No (Ref.)							
Yes	2.796	0.499	1	0.000	16.377	6.157	43.562
Constant	-0.847	1.300	1	0.514	0.429		

Model Adequacy Test

In binary logistic regression Hosmer- Lemeshow test statistic was used for the model adequacy test. For this test, a model is said to be a poor fit if the p-value is less than 0.05. Here for stunted chi-square value is 6.768 with 7 degrees of freedom and p-value is 0.453, which implies that there is no significant difference between observed and predicted values indicating that model fit the data at an acceptable level.

Table 3.5 Hosmer and Lemeshow Test

Chi-square	Df	Sig.
6.768	7	0.453

Discussion

The purpose of this study was to assess nutritional status and associated factors among 6 months to 59 months children. In view of that, in this study, the levels of stunting was 41%. The prevalence reported in this study is higher than the 2019 UNDP report, of which 36.6% % was stunted (6).

In this study, the prevalence of stunting was 41%. This is comparable with the 2013 UNICEF report in which the prevalence was 40% and 39% in Sub- Saharan Africa and in South Asia, respectively (29). However, the finding of this study was higher than previous reports in Gumbrit (30), was 24%, China (31), was 20%, and Pakistan (32), was z21%, Botswana (38.7%) (33), Vietnam (36.3%) (34), Nigeria (35) was 12.4%, (37) was 18%, South Africa and Nigeria (38) was 12.5%. These might be due to deference in family educational status, family planning, and economic development.

The study showed that in a large number of family size malnutrition among children 6-59 months is higher than that of small family size. Similarly, malnutrition was high on families who have more than two under-five children than that of two and fewer children. Children from non-educated families were more malnourished than educated families. Under families with sufficient income, malnutrition was less when compared with families with insufficient annual income. Children from families who do not know about malnutrition and weaning and supplementary foods, majorities were malnourished when compared that of children's families that know about malnutrition and weaning and supplementary foods. Children from mothers who taken vaccination were less malnourished when compared that of children from mothers who have not taken vaccination. And increasing the age gap between babies will decrease the percentage of malnutrition among 6-59 months aged children.

Conclusion and Recommendation

Prevalence of malnutrition among 6-59 months aged children in Gardez, Afghanistan was high. And variables such as Family size, Number of children under 5, Life status of parents, Father's educational level, Mother's educational level, Annual income status, Food items do you feed to children, Awareness about weaning and supplementary food, Awareness about malnutrition, Age Weaning food should be started, Breast-feed status, Period of time to feed breast, Food during Pregnancy, Status of immunity, Vaccinated during pregnancy, the age gap between babies and MUAC Mother were associated with nutritional status of children in Gardez, Afghanistan. Therefore, as a recommendation, the concerned bodies must design policies that can improve the livelihood of households, works on information dissemination using mass media about malnutrition, weaning, and supplementary foods, and meals during pregnancy. Also, Family planning is essential to promoting the well-being and autonomy of families. Accordingly, the government should give big attention to family planning and revise and establish policies to design and implement family planning programs. Similarly, this study recommended to the concerned body to investing in health services regarding eliminating malnutrition.

Acknowledgement

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