RESEARCH ARTICLE

Study on Stunting of 6 to 59 Months Children and Factors associated Within at Gardez City, Paktia Province of Afghanistan

Maail K. Mangal[1], Mohammad H. Ahmadzai[1], Khoshal Janatzai[2]

Abstract

Introduction: Evidence about risk factors of Stunting is useful to design appropriate policies and strategies to control health problems.

Objective: A cross-sectional study was conducted among children aged 6–59 months in Paktia Regional Hospital.

Material and Methods: 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.

Results: 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.

Conclusion: 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: Children, Gardez, Stunting, Under nutrition.

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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% 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%. 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

[1]Department of Internal Medicine, Faculty of Medicine, Paktia University, Gardez, Afghanistan.

[2]Department of General Surgery, Faculty of Medicine, Paktia University, Gardez, Afghanistan.

Corresponding Author: Mohammad Hanif Ahmadzai. member of the Internal Medicine Department, Medical Faculty, Patkia University, Afghanistan, Email: hanifishakir5@gmail.com

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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). 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.[9]

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 underweight observed among under-five children. It is for this reason that this study sought to investigate the factors influencing the condition of underweight among children under 5 years of age in Gardez Town.

Material and 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

Prevalence of Stunting

Figure 1 shows that the prevalence of stunting in children. This study shows that 41% of children had stunting in my country.

Prevalence of Stunting by Gender-wise

Figure 2 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.

Association between Stunting and Different Variables

Table 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).

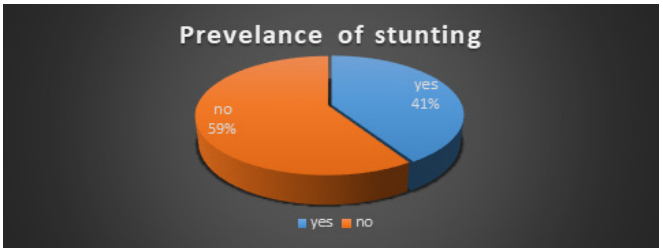

Figure 3.1: Pie-chart showing the prevalence of stunting.

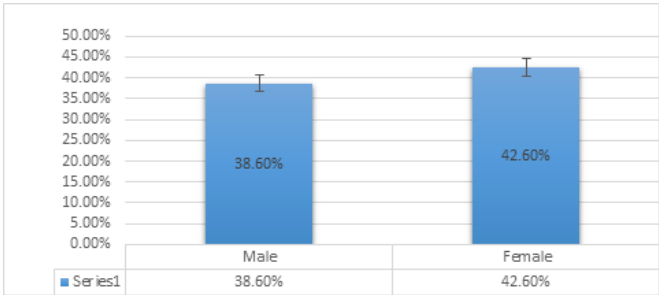

Figure 2: Nutritional status of male and female 6–59 months aged children

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%,

Table 1: Association between height for age (Stunted) and different variables

		Height for age (stunted)			
Variables		*Yes*	*No*	*Chi-square*	*p-value*
Gender	Male	98	39	4.2	0.046
		71.50%	28.50%		
	Female	161	102		
		61.20%	38.80%		
Family size	<6	3	77	313.363	0.000
		3.80%	96.30%		
	6–10	11	56		
		16.40%	83.60%		
	11–15	103	5		
		95.40%	4.60%		
	16–20	61	2		
		96.80%	3.20%		
	>20	81	1		
		98.80%	1.20%		
Number of Children	<3	82	47	0.918	0.632
		63.60%	36.40%		
	6-Mar	135	67		
		66.80%	33.20%		
	>6	42	27		
		60.90%	39.10%		
Number of Children Under 5	1	26	97	148.048	0.000
		21.10%	78.90%		
	2	117	23		
		83.60%	16.40%		
	>2	116	21		
		84.70%	15.30%		
		62.60%	37.40%		
Life Status of Parents	Both Alive	229	137	9.311	0.025
		62.60%	37.40%	62.60%	37.40%
	Both Dead	8	1	8	1
		88.90%	11.10%	88.90%	11.10%
	Mother is Dead	9	2	9	2
		81.80%	18.20%	81.80%	18.20%
	Father is Dead	13	1	13	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

		Height for age (stunted)			
Variables		*Yes*	*No*	*Chi-square*	*p-value*
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%		
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%		

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,

		Height for age (stunted)			
Variables		*Yes*	*No*	*Chi-square*	*p-value*
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%		
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%		
	>6 months	111	91		
		55.00%	45.00%		
What was your food when you were Pregnant?	Rice/Vegetable/ Fruits/Bean/Potato (Vegetarian)	238	52		
		82.10%	17.90%		
	Rice/meat, Vegetable/Bean/ Potato, Fruit, Meat (Non vegetarian)	21	89		
		19.10%	80.90%		

		Height for age (stunted)			
Variables		*Yes*	*No*	*Chi-square*	*p-value*
Is your child being immunized	Yes	223	57	90.697	0.000
		79.60%	20.40%		
	No	36	84		
		30.00%	70.00%		
Are you being vaccinated during pregnancy?	Yes	100	115	67.749	0.000
		46.50%	53.50%		
	No	159	26		
		85.90%	14.10%		
Which water do you use?	Filtration	3	0	1.915	0.590
		100.00%	0.00%		
	River	8	4		
		66.70%	33.30%		
	Tap	10	7		
		58.80%	41.20%		
	Well	238	130		
		64.70%	35.30%		
What is the age gap between babies?	1 Year	144	34	109.161	0.000
		80.90%	19.10%		
	2 Year	79	24		
		76.70%	23.30%		
	3 Year	18	56		
		24.30%	75.70%		
	4 Year	1	18		
		5.30%	94.70%		
MUAC Mother (malnourished)	Yes	117	18	55.722	0.000
		86.70%	13.30%		
	No	78	94		
		45.30%	54.70%		

80.9% are stunted and from 4-years age gap only 5.3% are stunted.

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 2 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

Table 2: Logistic regression of Height for age (stunted) for different characteristics

						95% C.I. for OR	
	B	S.E.	Df	Sig.	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		

Table 3: Hosmer and Lemeshow Test

Chi-square	*Df*	*Sig.*
6.768	7	0.453

(with CI = 6.157 to 43.562) stunted as compared to children from mothers who are not malnourished (well-nourished).

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).

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 were 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.[10] However, the finding of this study was higher than previous reports in Gumbrit (24%), China (20%), Pakistan (21%), Botswana (38.7%), Vietnam (36.3%), and Nigeria (12.4%).[10-12] 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.

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References

1. Abdulahi A, Shab-Bidar S, Rezaei S, Djafarian K. Nutritional status of under-five children in Ethiopia: a systematic review and meta-analysis. Ethiop J Health Sci. 2017 Mar 15;27(2):175.
2. Khandelwal et al. - 2014 - Postgraduate education in nutrition in south Asia.pdf.
3. Nasreddine et al. - 2018 - Review of the nutrition situation in the Eastern M.pdf.
4. Nasreddine L, Ayoub JJ, Al Jawaldeh A, WHO Regional Office for the Eastern Mediterranean. Review of the nutrition situation in the Eastern Mediterranean Region. East Mediterr Health J. 2018 Jan 1;24(01):77–91.
5. Nurani N, Sitaresmi MN, Ismail D. Risk factors for malnutrition in under-five children: one year after the Yogyakarta earthquake. Paediatr Indones. 2011 Dec 31;51(6):327.
6. Kinyoki DK, Kandala N-B, Manda SO, Krainski ET, Fuglstad G-A, Moloney GM, et al. Assessing comorbidity and correlates of wasting and stunting among children in Somalia using cross-sectional household surveys: 2007 to 2010. BMJ Open. 2016 Mar;6(3):e009854.
7. Ansuya, Nayak BS, Unnikrishnan B, George A, N. SY, Mundkur SC, et al. Risk factors for malnutrition among preschool children in rural Karnataka: a case-control study. BMC Public Health. 2018 Dec;18(1):283.
8. Martorell R. The Nature of Child Malnutrition and Its Long-Term Implications. Food Nutr Bull. 1999 Jan;20(3):288–92.
9. Horton S, Steckel RH. Malnutrition Global economic losses were attributable to malnutrition 1900- 2000 and projections to 2050. :37.
10. J. A.Quadri andM. A. Ojure, "Assessment of the nutritional status of under-five children in Akure South local government, Ondo state, Nigeria," *International Journal of Recent Research and Applied Studies*, vol. 14, no. 3, 2013.
11. M. Niyibituronsa, F. Kyallo, C. Mugo, and S. Gaidashova, "Improving the nutritional status of malnourished children using soybean products in Rwanda," *African Journal of Food, Agriculture, Nutrition and Development*, vol. 14, pp. 9136–9153, 2014.
12. F.N. Kariuki, J.M.Monari, M. M. Kibui et al., "Prevalence and risk factors of malnutrition," *Journal of the National Institute of public Health*, vol. 51, no. 1, 2002