

# Factors Associated with Stunting among Children Under Five Years of Age in Pakistan: Evidence from PDHS 2012-13

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## Abstract

**Objective:** The main objective of this research study was to draw the association of different factors towards stunting in under five years of age children in Pakistan.

**Methods:** The survey was conducted in a total of 498 areas. Data was collected by using a stratified two-stage cluster national sample across 14,000 households (6,944 in urban areas and 7,056 in rural areas). For data collection a representative sample of households was taken from different provinces of Pakistan (Islamabad and Gilgit Baltistan) including 12,943 household with 13,557 women aged between 15-49 years.

**Results:** This study had showed that 31.4% population of less than five years of age is suffering from stunting in Pakistan. In regional wise distribution stunting was much higher in Baluchistan as compare to other regions, i.e., 43%. While Islamabad (ICT) has the lowest number of stunted children, i.e., 18.5%.

**Conclusion:** This study exposed that the Region, Access to information, Parents Education, economic status has substantial relationship with malnutrition. While the Number of children in family and taking another type of milk rather than mother feed in first 3 days has no significant relationship towards stunting among children less than 5 years of age.

**Keywords:** PDHS (Pakistan Demographic Health survey); NIPS (National Institute of Population Studies); Education; Children

## Introduction

Child growth is internationally recognized as an important public health indicator for monitoring nutritional status and health in populations. According to WHO among all the threats to health hunger and malnutrition is one of the biggest threats to human health. Therefore improvement in nutritional status and dietary habits is considered as the most significant form of treatment towards malnutrition and stunting [1,2]. All over the globe there are more than 150 million children less than five years of age are suffering from malnourishment. Internationally 35% (9.2 million) of deaths occur due to malnutrition [3] and in developing countries there are almost 80% population of children less than five years is suffering from stunting. South Asia is the main area that contributes with double burden of diseases including both communicable and non-communicable diseases and among which half of world's malnourished children are living specially in Bangladesh, India and Pakistan. The rate of underweight children is very high in these states because half of females of reproductive age have weight below than normal range and major number of new-borns delivered by these females also has low birth weight [4]. Pakistan has population of more than 180 million and is still developing therefore this country is facing foremost challenges in public health especially for the health of children and females of reproductive age. In this area imbalance nutrition is a major factor that leads towards poor health status of these vulnerable groups. About 58% population in Pakistan is food insecure and among them 28.6% population is food insecure with moderate to severe starvation [5].

Malnutrition is the pathological state resulting from relative or absolute deficiency of one or more of essential nutrients in diet [6,7]. Malnutrition can lead to different complications which include marasmus, Kwashiorkor, wasting and stunting, micronutrient and macro-nutrient deficiencies, as well as diabetes and other diseases [8]. In children malnutrition can be detected by commonly used three

measures that are: stunting (extremely low height for age), underweight (extremely low weight for age) and wasting (extremely low weight for height). These measures of malnutrition are related to each other [9]. Malnutrition, starvation, unavailability of proper food, unhygienic conditions poses a great threat to the world's public health [1,2].

Research showed the different causative factors of stunting, among of which poor attention, memory damage, reduced learning environment, low school enrollment and low cognitive functioning level is highly associated with stunting. All of these factors lead to low level of productivity in adults [10-12].

Unability to attain normal growth potential because of imbalance nutrition or poor health, also defined as a chronic restraint of growth in height that is specified by low height for age. Stunting is usually a trustworthy indicator of chronic under-nutrition among young children [13]. The study has focused on stunting as an indicator of malnutrition. The objective of this study is to find out the related factors of stunting among children under the age of five years in Pakistan.

## Literature Review

Malnutrition is a chief public health issue of developing countries of the World [14]. Malnourished children have high rate of morbidity and mortality and often agonize with delayed mental development,

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**Received** April 03, 2018; **Accepted** April 23, 2018; **Published** April 30, 2018

**Citation:** Ali SB, Amir, Ashraf S (2018) Factors Associated with Stunting among Children Under Five Years of Age in Pakistan: Evidence from PDHS 2012-13. J Comm Pub Health Nursing 4: 219. doi:10.4172/2471-9846.1000219

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poor school performances and decreased academic achievement. In these countries different efforts had been taken to examine the causes of malnutrition in under-five year children of farming households. Different studies were conducted to identify the baseline causative factors of malnourishment among selected population. This was the research gap which this study hopes to fill. An understanding of the factors of malnutrition is essential to develop if we want to reduce this current high rate of malnutrition. Through nutritional surveillance and proper monitoring most affected population can be identified and then further measures can be taken for re-establishment of nutritional level. This is under debate that good nutritional status or nutritional well-being is based on at different dimension of income and expenditure. In addition, well-being of nutritional status can be directly observed by well-being of individual's good health. Monetary comparisons of nutritional well-being over time are hindered by the absence of reliable and provable deflators and information collected in surveys is often insufficient to solve this problem [15].

A survey conducted in sub-Saharan Africa in 2008 estimated that 178 million children under age 5 were stunted. This survey showed that 55 million children were wasted, including 19 million who have severe wasting or severe acute malnutrition disorder [16]. By properly measuring the child's growth (Height and Weight) according to age one can estimate the presence of malnutrition, but weight and height measurements alone are insufficient to recognize the kwashiorkor and of the severity of malnutrition in children [17].

According to Copenhagen Consensus 2008 it was estimated that due to under nutrition there is a 35% burden of diseases in children less than 5 years age. Although the good nutrition status of children strongly depends on the good nutrition status of their mothers during pregnancy and breastfeeding [16]. The World Health Organization estimates that malnutrition accounts for 54% of child mortality worldwide, about one million children. Even mild degrees of malnutrition increase the risk of mortality for respiratory, diarrheal disease and can increase the mortality and morbidity rate twofold [13].

In Pakistan the prevalence of underweight and stunting is approximately 38% [18]. On comparison of Pakistan with India about 2.5 million of under 5 children died out of 10.5 million due to malnutrition in India [19]. A report was published by UNICEF in 2006 stated that in developing countries around 146 million of children are underweight. It shows that every fourth child of developing country is underweight. Half of the world's underweight children residing in India, Pakistan and Bangladesh [20].

Malnutrition contributes to 50-60% of death rate in Pakistan in less than five year of age children [21]. According to a report of PDHS (1990-1991) 50% of under five children were found stunted, 40% children were reported underweight and 9% population were wasted [22]. And the same results were shown by Pakistan National Health Survey that was conducted in 1985-1987. While a survey conducted in 2000-2006 showed some moderate progress that 38% were underweight, 13% were wasted and 37% were stunted [23].

In Pakistan 43.7% children less than 5 years were stunted. By comparing population of urban and rural areas of Pakistan the rate of stunting were high in rural areas (46.3%) than in urban areas (36.9%). Wasting rate was 15.1 percent and fewer children were wasted in urban areas (12.7%) as compared with rural areas (16.1%). 31.5 percent of the children were underweight, with higher rates in rural areas (33.3%).

The pointers of malnutrition looked to be higher in rural areas than in urban areas [24].

The Pakistan's government has set the standards to minimize the stunting the target of reducing from 44 to 34% till 2017 and to finish hunger till year 2030 by adopting a holistic approach. Studies have elaborated the relationship of stunting with antenatal check-up, care of mother during pregnancy, knowledge level of mother, etc. Literature demonstrated that one of the main causes of stunting in developing countries is gender disparities. Different strategies should be taken into account to overcome this gender disparity, if we want to reduce the stunting in Pakistan till year 2030 [25].

### **Aim of the Study**

Improve health status of children less than five years of age in Pakistan.

### **Objective of the Study**

To find out the relationship of different factors towards stunting, among children less than 5 years of age in Pakistan.

### **Methodology**

#### **Data and sample**

In all over the world Demographic and Health Survey (DHS) has used to collect data, monitor and evaluate the female's health status regarding nutrition and fertility and with this tool various steps has taken to improve the health status of females of reproductive age [26]. The PDHS is shaped by DHS in association with the Ministry of National Health Services and executed by the National Institute of Population Studies (NIPS). The PDHS is part of the international Demographic and Health Survey program, which is intended to collect data on female's health status, e.g. fertility, family planning and maternal and child health. Different authors has expressed their opinions in this report about various health issues of reproductive age females and do not necessarily reflect the views of USAID and the government of Pakistan. This study has used secondary data from the Pakistan Demographic and Health Survey (PDHS) 2012-2013, which was the third national household survey conducted in the Pakistan. The data was collected using a stratified two-stage cluster national sample across 14,000 households (6,944 in urban areas and 7,056 in rural areas). The survey was carried out in a total of 498 areas.

Data was collected from a representative sample of households across all urban and rural areas of the four provinces of Pakistan, Islamabad and Gilgit Baltistan, including 12,943 household with 13,557 women aged between 15 and 49 years. Women who were married at the time of survey and in reproductive age (15 to 49 years) with at least one child birth during 5 years preceding PDHS were included in this study.

Frequency tables of selective indicators were created by using descriptive statistics. Association between different variables and stunting of children were analyzed by bivariate analysis using Pearson's Chi-square test. According to PDHS the height-for-age catalog is an indicator of growth retardation and cumulative growth problems in children. By Reference value of WHO, Children whose height-for-age Z-score is below minus two standard deviations (-2 SD) from the median are considered as short for their age (stunted) children or chronically malnourished children.

#### **Dependent variables**

Dependent variable used for this study was stunting.

## Independent variables

Region, Wealth Index (Economic Status), Education Level of Parents, Access to information, First 3 Days given milk and number of children in family.

## Results

The dependent variable of the study which was Stunting (among less than five years of age children) was 31.4% (Table 1).

	Frequency	Percent
Normal	1775	68.6
Stunting	811	31.4
Total	2586	100

Table 1: Stunting.

Variable	Frequency	Percent
<b>Access to information</b>		
No access to information	2226	30
Access to information	5204	70
<b>Education</b>		
No education	4121	55.2
Primary	1065	14.3
Secondary	1373	18.4
Higher	902	12.1
<b>Wealth Index</b>		
Poorest	1623	21.8
Poorer	1483	19.9
Middle	1429	19.2
Richer	1423	19.1
Richest	1503	20.1
<b>First 3 days, given milk (other than breast milk)</b>		
Yes	1533	21.5
No	5585	78.5

Table 2: Independent variables.

Region	Stunting		Total
	Normal	Stunting	
Punjab	520	192	712
	73.0%	27.0%	100.0%
Sindh	338	211	549
	61.6%	38.4%	100.0%
Khyber Pakhtunkhwa	395	139	534
	74.0%	26.0%	100.0%
Balochistan	212	160	372
	57.0%	43.0%	100.0%
Gilgit Baltistan	178	79	257
	69.3%	30.7%	100.0%
Islamabad (ICT)	132	30	162
	69.3%		100.0%
Total	1775	811	2586
	68.6%	31.4%	100.0%

### Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	62.108 <sup>a</sup>	5	0.000
Likelihood Ratio	62.111	5	0.000
Linear-by-Linear Association	0.002	1	0.967
N of Valid Cases	2586		

Table 3: Effect of region on stunting.

The following are some dependent variables of the study. Majority of families were access to information. Most of the parents were illiterate (Table 2).

Associations between different variables and stunting of children were analyzed by bivariate analysis using Pearson's Chi-square tests. The following are some tables of Bivariate Analysis (Table 3).

In regional wise distribution Baluchistan have the maximum number of stunted children. In Baluchistan stunting in less than five years of age children is 43.0%, which is much higher than other regions (Table 4).

Those parents have no access to information have 34.8% stunted children, while those who have access had 29.8% stunted children (Table 5).

Parent's education is inversely proportional to child stunting. Those who are illiterate or have primary education had 34.7% and 33.4% stunting children respectively (Table 6).

Poorest families have 39.9% of stunting children, while the richest

Access to information	Stunting		Total
	Normal	Stunting	
No access to information	519	277	796
	65.2%	34.8%	100.0%
Access to information	1250	531	1781
	70.2%	29.8%	100.0%
Total	1769	808	2577
	68.6%	31.4%	100.0%

Table 4: Access to information and stunting.

Highest educational level	Stunting		Total
	Normal	Stunting	
No education	907	483	1390
	65.3%	34.7%	100.0%
Primary	269	135	404
	66.6%	33.4%	100.0%
Secondary	359	138	497
	72.2%	27.8%	100.0%
Higher	240	55	295
	81.4%	18.6%	100.0%
Total	1775	811	2586
	68.6%	31.4%	100.0%

Table 5: Parents education level and stunting.

Wealth index	Stunting		Total
	Normal	Stunting	
Poorest	327	217	544
	60.1%	39.9%	100.0%
Poorer	355	179	534
	66.5%	33.5%	100.0%
Middle	321	150	471
	68.2%	31.8%	100.0%
Richer	367	156	523
	70.2%	29.8%	100.0%
Richest	405	109	514
	78.8%	21.2%	100.0%
Total	1775	811	2586
	68.6%	31.4%	100.0%

Table 6: Wealth index and stunting.

No of Children		Stunting		Total
		Normal	Stunting	
Less than 3		1661	768	2429
		68.4%	31.6%	100.0%
4 to 8		102	38	140
		72.9%	27.1%	100.0%
9 to 13		12	5	17
		70.6%	29.4%	100.0%
Total		1775	811	2586
		68.6%	31.4%	100.0%

Table 7: Number of children in family and stunting.

First 3 days, given milk (other than breast milk)		Stunting		Total
		Normal	Stunting	
No		1304	599	1903
		68.5%	31.5%	100.0%
Yes		387	183	570
		67.9%	32.1%	100.0%
Total		1691	782	2473
		68.4%	31.6%	100.0%

Table 8: First 3 days given milk other than mother results show that milk other than breast milk given in the first three days has no impact on child stunting.

have only 21.2% of stunting children (Table 7).

The results show that there is no significant difference between number of children in family and stunting (Table 8).

## Discussion

This study has showed the prevalence of stunting among less than five years of age children is 31.4% in Pakistan. This is much lesser than NNS (National Nutritional Survey) 2011 and 2001. National Nutritional Survey in 2001 reported 43.7% under five children stunted in 2011 as compared to 41.6% in the 2001 (NNS 2001).

In regional wise distribution stunting was much higher in Baluchistan (43%) as compared to other regions. While Islamabad (ICT) has the lowest number of stunted children, i.e., 18.5%. The reason of the huge difference between different regions may be due to parent's education and socioeconomic status, as studies showed that these factors are positively associated with nutritional status of the children. Parents with access to information have 29.8% of stunted children, while those who don't have access to information have 34.8% stunted children.

Parents with higher level of education have 18.6% of stunted children, while those who have no education have 34.7% stunted children. A study in Egypt illustrated that children whose mothers had a higher level of education had a lower risk of stunting than those of mothers with no education.

Poorest families have 39.9% of stunting children while the richest have only 21.2%. Different studies showed that socioeconomic status and stunting are positively associated.

## Conclusion

According to analysis it is observed that the Region, Access to information, Parents Education, socio-economic status has significant association with malnutrition. While the Number of children in family and milk other than mother feed in first 3 days has no significant association towards stunting among children less than 5 years of age.

## Ethical Considerations

Researcher has used publically available secondary data from PDHS 2012-2013 for this study. Ethical approval was not required from the concerned institution. However approval was obtained to use the data set to Measure DHS.

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