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Pediatric Healthcare Implications of Maternal Antenatal Care (ANC) And Postnatal Care (PNC) Services Utilization

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ABSTRACT

Learning how access to healthcare for mothers in Pakistan influences the nutritional status of their children is the primary goal of this research. The dependent variables utilized were stunting in children. The variables used for analysis included antenatal care, postnatal care, mother's age, mother's job status, mother's education, father's education, household's wealth status, household's area of residence, household's region, and child's sex. The 2017–18 Pakistan Demographic Health Survey (PDHS) provided the data utilized in this research. Adjusted odds ratios were calculated to investigate the relationship. The study has found that antenatal care use, postnatal care use, the child's mother's education, the household's wealth status, the household's region, and the sex of the child are the main determinants for both dimensions of child nutrition. The study concludes that a mother's education continues to be a powerful predictor of a child's nutritional health. As a result, strategies aimed at reducing childhood stunting and wasting should entail educating and empowering women, as well as boosting access to PNC and ANC treatments in Pakistan.

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1. Introduction

Malnutrition occurs when a person consumes too little or too many nutrients. It can cause major health problems, such as stunted growth, vision disorders, diabetes, and heart disease. Malnutrition is a global problem that affects billions of people. Malnutrition imposes unacceptably high direct and indirect costs on individuals, families, and nations in all of its forms. Effects of stunted height also relate to labour market engagement. Cross-country data suggests that a loss of 1% of potential attained height in adulthood reduces earnings by 2.4% (Hoddinott, 2016). Impaired learning, poor school performance, affected adult labour productivity, and higher health-care costs all add up to additional costs (Global Panel, 2016).

Stunting appears to be the most severe form of malnutrition due to its far-reaching consequences. It is likely to have an impact on school attendance and the ability to acquire and apply knowledge, as well as the chance of earning and living a decent life later in life.(Ford & Stein, 2016) (Hasan, Soares Magalhães, Williams, & Mamun, 2016) (Glewwe & Jacoby, 1995) (Pitt, Rosenzweig, & Hassan, 1990). Furthermore, it raises the risk of both morbidity and the mortality in children under aged five (Pelletier, 1994). Malnutrition is the major cause of

morbidity and mortality among children under the age of five in Pakistan, which ranks 22nd in the whole world in terms of under-five mortality (Bhutta et al., 2013).

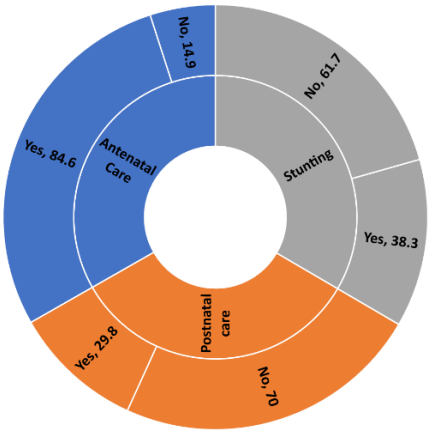
Stunting and wasting are both symptoms of being underweight. Low-birth-weight newborns have a higher chance of dying in their first 28 days. Even those who survive face stunted growth and weakened cognitive abilities. They are also develop serious health problems later in life, such as obesity and diabetes (Zhang et al., 2018). The mother's low nutritional condition, the recurrence of infectious disease, and inadequate childhood healthcare are some of the causes of being underweight among underweight children. (Arif, Farooq, Nazir, & Satti, 2014).

Table 1: Prevalence of Malnutrition: Global Versus National Statistics

Variables	Pakistan	Worldwide
Stunting	12 Million	149 Million
Wasting	2.5 Million	45 Million
Underweight	3 Million	38.9 Million
Overweight	8.5 Million	41 Million

Source: Pakistan data collected according to the National Nutrition Survey 2020. World data collected from World Health Organization 2020.

Figure 1: Situation regarding maternal healthcare use and child malnutrition in Pakistan



Child malnutrition can close the window of opportunity to realize a child's full potential of life. It can cause irreversible and retarded growth, impaired learning and reduced work performance. Child's compromised physical and mental health can finally lead to direct and permanent productivity losses. At the same time, child nutrition relies very much on preconception, antenatal, and postnatal maternal nutrition as well. Prenatal and postnatal healthcare is critical not only to a mother's physical and mental well-being and contributes to her abilities to serve the families, societies, and economies, but to render proper care to her newborn child at birth and years thereafter.

Maternal health during pregnancy and after delivery is essential for a mother's physical and mental well-being, as well as her ability to provide loving, proper care to her newborn child at birth and in the years after. Preconception, prenatal, and postnatal maternal nutrition, as well as fetal, neonatal, and child nutrition, are all included in maternal and child nutrition. Maternal diet is important in building the fetal epigenetic profile, which might affect the offspring's health later in life. Every child deserves a healthy diet and lifestyle, and every woman should have access to advanced prenatal and postnatal care. The birth of a new child should be a joyous occasion, but for many mothers throughout the world, it is a terrifying one. Nutrition is crucial at any age. Children require appropriate nutrients to be healthy and robust as they grow older. Children's nutrition may also help provide the framework for healthy eating habits and nutritional information that your child can utilize throughout his or her life.

Even in less developed countries, where social and economic situations have improved, the issue of childhood nutrition continues to be a significant public health and social problem. There are a number of important aspects that play a role in childhood nutrition, including antenatal care, postnatal care, mother age, mother employment status, mother education, father

education, household wealth status, household area of residence, household region, and child sex. In comparison to other South Asian countries, Pakistan has had a slower improvement in the nutrition and health of its children. Pakistan has one of the worst rates of malnutrition in the world, and it has also seen a slower recovery in that regard.

Many studies have been conducted that examined the impact of antenatal care use on child nutrition in different countries of the world as well as in Pakistan. Most of the studies conducted across the countries as well as in the context of Pakistan focused on the use of antenatal care as a factor affecting child nutrition but the literature existing on the use of postnatal care as an explanatory factor affecting child nutrition is very rare and not existing in the case of Pakistan.

2. Methodology

During the most recent study, the data from the survey that was acquired from the database of the Department of Homeland Security for Pakistan served as the basis. The majority of the time, research publications focus on models in which the dependent variable is categorical. Assuming that the dependent variable is classified as belonging to one of the following categories: "not stunted," "stunted or severely stunted," mother age, mother employment status, mother education, father education, household wealth status, household area of residence, household region, and child sex, we might be interested in gaining further insight into the connections that exist between these variables. Rather than use multiple regression analysis, which disregards the categorical nature of the predictor variable, we would make use of logistic regression analysis.

According to the basics of discrete choice models, this requires making a decision between two alternative scenarios that are incompatible with one another: "wasted or badly wasted, or 'not wasted,'" and "stunted or severely stunted, or 'not stunted,'" respectively. Alternately, the dependent variable in the logit model is either dummy or dichotomous, with (1) indicating that the child is stunted or severely stunted and (0) indicating that the child is not stunted. Both of these labels are used to describe the dependent variable.

3. Results and Discussion

3.1. Pediatric Healthcare Implications of Maternal Healthcare Services Utilization

Table 2 presents the descriptive statistics regarding independent variables. No, yes, and don't know where the three categories used to classify prenatal care. A total of 4099 people were surveyed, with 14.9% not receiving any prenatal care, 84.6% receiving it, and 0.5% falling into the "don't know" category. Additionally, there were three categories for postnatal care: no, yes, and don't know. Postnatal care was not provided to 70.0% of the sample, 29.8% of respondents received it, and 0.2% were in the "don't know" group. We divided mothers' ages into seven groups based on their years of experience: 15–19, 20–24, 25–29, 30–34, 35–39, 40–44, and 45–49. From the total sample, 2.9% were in the 15–19 age group, 20.9% were in the 20–24 age range, 31.8% were in the 25–29 age group, 25.9% were in the 30-34 age group, 14.0% were in the 35–39 age group, 4.1% were in the 40–44 age group, and 1.4% were in the 45–49 age group. When asked about their employment status, mothers were divided into two groups: those who were employed (11.3%) and those who were not (86.7%).

In terms of socioeconomic status, around 20.8% fall into the lowest category, 25.1% into the poorest, 19.1% into the middle, 17.8% into the richest, and 17.2% into the wealthiest still. Households could be found residing in either rural or urban areas, depending on their location. Of the total households surveyed, 45.6% were located in urban areas, while 54.4% were in rural areas. Respectively, 61.7 Stunting has only two categories such as 61.7 percent of children were not stunted and 38.3 percent of children were stunted and severely stunted. Wasting also has only two categories such as 92.1 percent of the children not wasted and only 7.9 percent of the youngsters wasted and seriously wasted.

The table 3 shows that the results evaluated from binary logistic regression to find out the determinants of child nutrition (stunting). Antenatal care visit has inverse impact on stunting. Moms who received prenatal care visits had a 0.769 reduction in stunting compared to mothers who did not have antenatal care visits. Postnatal care visit is an important determinant and it showed negative effect with stunting.

Table 2: Descriptive Statistics

Variables	Frequency
Prenatal Care	No: 14.9% Yes: 84.6% Don't Know: 0.5%
Postnatal Care	No: 70.0% Yes: 29.8% Don't Know: 0.2%
Mother's Age Groups	15–19: 2.9% 20–24: 20.9% 25–29: 31.8% 30–34: 25.9% 35–39: 14.0% 40–44: 4.1% 45–49: 1.4%
Mother's Employment Status	Employed: 11.3% Not Employed: 86.7%
Mother's Education	No Education: 50.8% Primary Education: 13.9% Secondary Education: 20.6% Higher Education: 14.7%
Father's Education	No Education: 27.3% Elementary Education: 14.8% Secondary Education: 34.3% Higher Education: 23.5% Don't Know: 0.1%
Wealth Status	Poorest: 20.8% Poorer: 25.1% Middle: 19.1% Richer: 17.8% Richest: 17.2%
Household Location	Urban: 45.6% Rural: 54.4%
Household Region	Punjab: 21.9% Sindh: 18.8% KPK: 16.7% Baluchistan: 11.5% GB: 6.7% ICT: 5.6% AJK: 10.5% FATA: 8.2%

According to the findings, moms who received postnatal care visits reduced stunting by 0.829 compared to mothers who did not get postnatal care visits. The mother's age has an influence on stunting in both positive and negative ways. Mother placed in age group 20 to 24 had 1.266 more probability to be stunted as compare to the reference category. On the same ground, mother aged 25 to 29, 1.650, less probability to be stunted. According to employment status of mother as compared to reference category (employed), unemployed mothers have the probability stunting raised by 1.237. Mother education is another important determinant and it showed negative association with stunting. Result shows that stunting decreased with the education level.

Table 3: Frequency Distribution, Chi-Square Association, Odds Ratios

Variable	Categories	Percent	Pearson Chi-Sq.	Wald	Df	Adj. Odds Ratios
Child Health (Dependent Variable)	Not stunted	61.7				
	Stunted	38.3				
Antenatal care	No (RC)	14.9	115.53***	4.476	2	
	Yes	84.6		4.413	1	0.769**
Postnatal care	No (RC)	70	19.39***	4.184	2	
	Yes	29.8		3.289	1	0.829*
Mother Age	15-19 (RC)	2.9	3.19	11.452	6	
	20-24	20.9		0.939	1	1.266
	25-29	31.8		4.434	1	1.65**
	30-34	24.9		2.486	1	1.462
	35-39	14		1.809	1	1.398
	40-44	4.1		1.81	1	1.483
	45-49	1.4		0.465	1	0.769
Mother Employment Status	No (RC)	88.7	7.96***	2.392	1	1.237
	Yes	11.3				
Mother Education	No education (RC)	50.8	220.85***	16.266	3	
	Primary education	13.9		1.288	1	0.856
	Secondary education	20.6		4.216	1	0.757**
	Higher education	14.7		16.164	1	0.49***
Father Education	No education (RC)	27.3	127.62***	2.536	4	
	Primary education	14.8		0.814	1	0.883
	Secondary education	34.3		2.489	1	0.828
	Higher education	23.5		0.929	1	0.869
Household Wealth Status	Poorest (RC)	20.8	280.49***	25.228	4	
	Poorer	25.1		16.439	1	0.599***
	Middle	19.1		11.343	1	0.603***
	Richer	17.8		16.109	1	0.5***
	Richest	17.2		19.506	1	0.414***
Household Area of Residence	Urban (RC)	45.6	37.84***	2.218	1	0.858
	Rural	54.4				
Household Region	Punjab (RC)	21.9	149.18***	21.049	7	
	Sindh	18.8		6.729	1	1.441***
	KPK	16.7		0.102	1	0.954
	Baluchistan	11.5		3.167	1	1.343**
	GB	6.7		0.366	1	1.122
	ICT	5.6		0.584	1	0.84
	AJK	10.5		1.095	1	0.834
	FATA	8.2		4.864	1	1.498**
Sex of Child	Male (RC)	50.5	0.979	5.855	1	0.814**
	Female	49.5				
Constant			1.636	1	0.19	1.658
Model Summary	**Nagelkerke R Square**				0.113	
	Cox & Snell R Square				0.082	
	-2 Log likelihood				3253.263	
	N				4099	

RC stands for reference category. *, **, and *** represents the significance levels respectively at 10%, 5%, and 1%

Mothers with secondary level education reduced stunting 0.757 as compared to the mother with no education. Similarly, mother with higher education reduced stunting 0.757 as compare to the mother with the probability of stunting decreased by 0.490 as compare to reference category. Like mother education, education of father also has inverse impact on stunting. Study also found the impact of household' socioeconomic position on stunting such as higher quintiles of wealth reduced stunting. Household in poorer quintile reduced stunting 0.599 as compare to household in middle quintile decreased the chance of stunting 0.603. Similarly, stunting decreased by 0.500 if the household is in richer quintile and reduced by 0.414 when household belonged to richest quintile. Regional level disparities also influence the child nutrition. Households belong to Sindh had 1.441 more chance of child to be stunted.

Households living in FATA had 1.498 more chance to be stunted as compared to reference category (Punjab). According to gender of child as compare to reference category (male), female gender had 0.814 less chance to be stunted. The findings of the current study are in line with that of the studies, like, Syeda, Agho, Wilson, Maheshwari, and Raza (2021) PDHS; Naz, Patel, and Uzoma (2020) PDHS 2017-18; Ahmad, Afzal, and Imtiaz (2020) in the Multan district of Pakistan's Punjab province; Paul, Zaveri, and Chouhan (2019) Data from the National Family Health Survey 2015-16 in India; Tariq, Sajjad, Zakar, Zakar, and Fischer (2018) PDHS 2012-2013; Khalid and Martin (2017) conducted in Punjab (Pakistan); and of the findings of the study Nuruddin and Hadden (2015) conducted in Pakistan.]

4. Conclusion and Policy Recommendation

Using binary logistic regression, this study examines the relationship between a child's nutritional status and factors such as maternal healthcare, prenatal care, postnatal care, mother's age, mother's employment status, mother's education, father's education, household's wealth status, household's area of residence, household's region, and child's sex in Pakistan. All of these factors are associated with the child's health in some way, either positively or negatively, according to the findings. Our results demonstrate both positive and negative correlations; nevertheless, the data is not perfectly correlated; this discrepancy is due to the fact that we asked the population several questions, which could introduce some mistake. Based on the assumption that the dependent variable is binary, this study employs the binary logistic regression technique.

The study recommends certain policies that may have an impact on mother health and child's nutritional status. After the analysis it is recommended that women get prenatal care, which should not be ignored because it has a significant influence on the child's health. Antenatal care visits play a significance role in child nutrition. Therefore, it should be compulsory for every mother. Postnatal care visits should be mandatory for every mother. That will help her to play important role regarding child health. Household wealth status also plays a significance role for child health by paying more money on chid growth. The Govt. should facilitate employed mothers in many aspects. Both mother and father education play a significant role in child nutrition. The government should take measure in Sindh, Baluchistan and Fata, which will improve the health of children. Gender discrimination should be avoided, particularly in rural parts of the state.

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