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Assessing inequality of opportunities to child health and nutrition: comparison of Bangladesh and Pakistan

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Abstract

The bright future of any society is always associated with its upcoming generation. Children are the future prosperity of any nation as they are productive workers of tomorrow. The main objective of this study is to estimate the opportunities available for children under age of 5 years and their mothers for different regions of Pakistan and Bangladesh. The core idea of this study is to access and compare Pakistan with Bangladesh as it was previously a poor and struggling part of it. Data of this study are gathered from Bangladesh Demographic Health Survey and Pakistan Demographic Health Survey for the year 2017–18. The overall comparison of Pakistan and Bangladesh had put Pakistan in a situation where it lagged in every aspect of health-related facilities provided to its citizen. Governments should focus on providing economic opportunities, Health, education, and nutrition to enhance regional and area-level living standards. Further, rural areas should be more focused, especially by the Government of Pakistan.

Keywords: Child inequality, Health, Nutrition, Housing conditions and regions

Introduction

The bright future of any society is always associated with its upcoming generation. Children are the future prosperity of any nation as they are productive workers of tomorrow. It is said that investing in children is the best future investment both at the household and national level. Better health and education facilities are the birthright of every child. Every country's priority is to ensure the provision of such facilities to its citizens. Unfortunately, children belonging to developing economies are mostly deprived of such amenities. In this regard, Pakistan and Bangladesh are the two countries that have faced the same situation in the past while providing Health and education-related programs. Keeping in mind the rapidly growing population of both economies, many issues are the same in both nations; however, in the past 2 decades, Bangladesh has dramatically changed the circumstances of its country by pulling out a big chunk of its population from poverty.

The development of any society can be arbitrated by its health status and fair distribution of health care dispersed across the social spectrum. It is recognized that

people's equitable access to health care services is vigorous for good health sustainability. Good health primarily depends on income levels and the quality of health services. Income, employment status of household earning members, access to healthcare services, education, social and economic opportunities, and living conditions are crucial factors that affect an individual's Health. The first 5 years of a child are significant for physical and mental development. Provision of primary health facilities in the initial years determines how the child will grow as an individual. In the initial years, the prenatal and post-natal care of a child, the mother's healthy diet during pregnancy, and vaccine against fetal disease play a critical role in a child's good mental and physical development. If some or all of the above-mentioned basic facilities are not provided, a child's growth may show stunted or malnutrition and can create some life-long disabilities in a child.

The population of Pakistan comprises 80.4 million children under 18 years. In Bangladesh, the total population is 164.7 million; among them, half of its population is under the age of 18 years. A higher population of children makes it imperative for programs, interventions, and policies that effectively support child rights. Like other developing nations, Pakistan and Bangladesh have depicted significant socioeconomic disparities and inequities in maternal health care practices. Therefore, it is challenging for Bangladesh and Pakistan to achieve set target 3.1 of SDG, i.e., universal access to reproductive Health, especially maternal and child health. Henceforth, various initiatives have been taken to improve maternal health indicators, but the progress has been slowed down due to wide disparities of income level, class, and social status. Hence, there is a need to identify patterns and extent of inequality of opportunities (IoP) in health and nutrition outcomes of children due to the direct impact of differences in circumstances on IoP and the significance of equality of opportunity on children's health and nutrition.

Over the years, the rapid growth of Bangladesh has come out as an outcome of progressive social policies. The measures of improvement boost the export along with providing financial independence to the women who traditionally do not prefer to go out for work; along with increasing the female labor force participation (Heath & Mobarak 2015). The revolutionary measures taken by the Government of Bangladesh makes it shine and bloom among South Asian countries. Although, the country remained the poorest in the region until 2006 but since then, Bangladesh's annual GDP growth has exceeded Pakistan's by roughly 2.5 percentage points per year. Bangladesh has tried hard to achieve this level of growth. Bangladesh was ranked eighth globally and first among the 20 poorest developing countries (Cleland, et al., 1994). However, as claimed by a report published by World Bank in 1994, its effective measures taken to provide improved health facilities and reduce the size of the population provides excellent results in coming years Caldwell et al. (1999). The remarkable efforts were made by the Government of Bangladesh to stand where it is today. The country, not very long ago, was considered among the poorest in South Asian countries, has achieved financial independence by providing essential Health, education, and economic stability to their females and children, especially health facilities related to childbirth, pre- and postal care and makes sure the provision of education for its citizen. The investment in human development makes them financially stable and emerge as the next economic tiger in the region.

Hence, the main objective of this study is to estimate the opportunities available for children under age five and their mothers for different regions of Pakistan and Bangladesh. This study is intended to highlight those loopholes in Pakistan's Health and education sector that has put it way behind in the race of economic growth. The rising population, poor health facilities, lower rate of enrollment in education, and very little presence of females in the labor force are a few factors that have put Pakistan way behind compared to its neighboring countries. The problems faced explicitly during pregnancy, the pre- and post-natal care facilities, and the deteriorated health-related issues are among the long list of existing inequality of opportunities among women and children. This analysis reflects how Pakistan is left far behind Bangladesh in providing fair and equal access to child health and nutrition development outcomes. This study also identified the strategies followed by Bangladesh to control the problems related to health and malnutrition in their state to overcome the rapidly spreading issue of health among young children. This study draws attention of policymakers and government to provide fair and equal access of child health and nutrition to improve their development in later life. Further, the circumstances beyond the control of children under five that may affect their development in later life are also estimated. This way, the set targets of SDG can be achieved by 3.1, 3.2, 3.4, and 3.7.

This study makes a significant contribution to the existing literature by addressing a critical gap in research. While numerous research articles have been published on the topic, none has specifically compared the health and nutrition conditions of Pakistan and Bangladesh. Hence, this study represents a noteworthy addition to the field of literature by assessing and comparing the current state of health and nutrition in Pakistan and Bangladesh, particularly considering that Bangladesh was previously a struggling and impoverished region. This study is pioneering in nature, as it fills the void in the literature by providing a comprehensive analysis of the health and nutrition conditions in both nations. By examining the intertwined issues of health, nutrition, malnutrition, and stunted growth among children under the age of five, this research sheds light on the similarities and differences between Pakistan and Bangladesh. These findings are crucial for policymakers and government officials as they strive to enhance the health and nutrition facilities in their respective countries. By focusing on key factors contributing to health and nutrition outcomes, this study aims to identify the disparities between Pakistan and Bangladesh. This analysis serves as a valuable resource for improving the healthcare at the government level, providing insights into the specific areas that require attention and intervention. By understanding the unique challenges faced by each country, policymakers can develop targeted strategies and initiatives to address the health and nutrition issues prevalent in their respective populations.

The remaining sections of the paper are structured as follows: the second section provides a comprehensive review of the relevant literature pertaining to the issue at hand. In the third section, we provide a detailed explanation of the methodology employed in the study, along with an overview of the data sources utilized. Moving forward, this section presents the main findings of the study, providing a contextual analysis of their relationship to previous research. We explore the consistency or potential contradictions that arise in comparison to prior studies. Finally, the last section of the paper concludes the study by presenting viable policy options based on the research conducted.

Review of literature

Many studies have identified the causes of malnutrition and health-related issues among children in Bangladesh. There is a vast literature available that has addressed the problems in detail and identified and worked on categorizing the potential solution as well. Giashuddin et al. (2005) and Hasan et al. (2020) have identified the factors associated with socioeconomic circumstances and make young children vulnerable to availing the health facilities. Giashuddin et al. (2009) built a relation to stunted growth of children with economic inequality. Reinbold (2011), Pulok et al. (2016), Anik and et al. (2021), and Chowdhury, et al. (2021) highlighted the problem of undernutrition in Bangladesh, and Karim et al. (2021) discuss the problem of acute malnutrition for low- and middle-income countries in general and in Bangladesh mainly. On the other hand, the literature available to evaluate the problems of children living in Pakistan is addressed in many studies. Babar et al. (2010) shed light on hitches of socioeconomic factors and their impact on malnutrition for school-going children; in the Sindh province of Pakistan, the study presented by Laghari et al. (2015). Mehmood et al. (2021) studied the prevalence and determinants of stunting among preschool and school-going children. The issue of Health and nutrition, including malnutrition, was discussed by Asim & Nawaz (2018), Iram & Butt (2006), and Khan, et al. (2016). At the same time, the association of poverty and its linkage with health was examined by Blakely et al. (2004). The problems related to the household socioeconomic status with its association to stunting for children in Pakistan was examined by Ali & Hussain (2021). Multiple factors were blamed by Ali, (2021) for the problem of malnutrition and stunting in children of Pakistan. A compelling factor that can make or break the life-long Health of a child is the importance of breastfeeding, specifically in the initial 2 years; this critical issue was discussed by Syeda, et al. (2021) and highlighted the same problem with building a relationship between breastfeeding duration and undernutrition conditions among children aged 0–3 years in Pakistan. Saheed, et al. (2021) addressed the problem of water, sanitation and connected it with malnutrition in the case of Pakistan, specifically for achieving the goals of sustainable development. The most critical factors responsible for the better development of a child are health and nutrition, as these aspects can predict the trajectory towards health outcomes in adulthood. Studies displayed that the cognitive, psychomotor, and social development of children gets affected due to malnutrition which has adverse effects on their adulthood (Park et al., 2011; De and Chattopadhyay, 2019; Kar et al., 2008). A health-related survey revealed in 2015 that about 7.7% of children were wasted, 24.5% were stunted and 15% were underweight globally (Akombi et al., 2016; WHO, 2010).

Despite rapid social and health indicators improvement, poor maternal health and child nutrition are highly prevalent in Bangladesh. UNICEF (2019) reports that in 2018, 36% of children of Bangladesh under the age of 5 years were stunted and 33% were underweight, 40% were non-pregnant women, and 50% of pregnant women suffered anemia. Early marriage and adolescent motherhood have adverse consequences on the nutritional outcomes of mother and child. It is found by many researchers that adolescent and malnourished mothers have an increased likelihood of neo-natal death, low birth weight, nutritional deficit, and retarded growth of children. Poor maternal nutrition and disadvantaged socio-demographic processes produce intergenerational malnutrition, morbidity, and mortality (Abdullah et al., 2007; Chen et al., 2007; Khatun et al.,

2019; Uddin et al., 2019). Inequality of opportunity (IoP) for disadvantaged children is due to inequalities in the distribution of external inputs and circumstances that are out of children's control, which includes household wealth and residence, as well as the availability and quality of child health services, food, clean water, and sanitation (Dabalen et al., 2014; UNESCO, 2007). IoP in Health and nutrition in developing regions is significant (Brunori et al., 2016; Jonah et al., 2018). Health care practices determine vast differences in health status. Health care practices reflect different socioeconomic constraints and unequal opportunities for different population subgroups. These characteristics are measured explicitly by income, occupation, education, residence, gender, ethnicity and others, not by any biological or genetic variation. Hence, the comparisons between the more and less advantaged social groups require a health equity assessment. The health equity assessment identifies whether health policies and programs lead towards or move away from social justice in Health and development (Braveman & Gruskin, 2003).

Moreover, studies such as Hasan et al. (2020), Karim, et al. (2021) and Zahangir and et al. (2017) keep their focus on malnutrition and its impact on child's health, while Dibley et al. (2010), Pappas et al. (2001), Nuruddin et al. (2009) and Senarath et al. (2012) highlighted the significance of feeding in young children. The importance of maternal education and its linkage with child's nutrition status was discussed by Anwar et al. (2013).

Methodology and data sources

For this study, the information is gathered from the demographic health survey of Pakistan and Bangladesh 2017–18 for analysis. Due to data limitations, Bangladesh opportunity index could not be estimated. Therefore, using different figures and tables, the information regarding health, nutrition, and housing conditions are taken into consideration that may affect children under-5 in later life. Sanoussi et al. (2020) has used Health, nutrition and household variables for children under 5 years for Sub-Saharan African countries. These variables will be used for under-5 children of Bangladesh and Pakistan to analyze their situation.

Health condition

In this section, various indicators related to health conditions are employed to compare the health status of two developing countries. For instance, the indicators used are fertility trends, children born and alive, children born to women of different age groups, early childhood mortality rates across region and gender, antenatal care, place of delivery and assistance during delivery, vaccination of children, prevalence and treatment of acute respiratory infection (ARI), diarrhea, time of post-natal checkup for mothers and newborns.

Figures 1 and 2 show under-5 mortality rates of Bangladesh by division and under-5 mortality rates of Pakistan by region. Khulna has the lowest mortality rate, and Sylhet has the highest mortality rate in Bangladesh. While in Pakistan, FATA has the lowest mortality rate, and Punjab has the highest mortality rate. Regions with the highest mortality rates may impact the mortality rate of the overall country. Over the years, fertility rate has increased in Pakistan, while it has remained constant in Bangladesh. Globally Pakistan ranks 23rd for under-5 mortality (UNICEF, 2015).

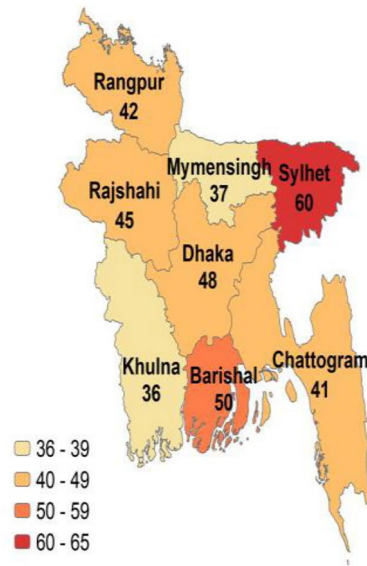


Fig. 1 Under-5 mortality by division. Deaths per 1000 live births for the 5 years before the survey. Source: Bangladesh Demographic Health Survey (BDHS) 2017–18

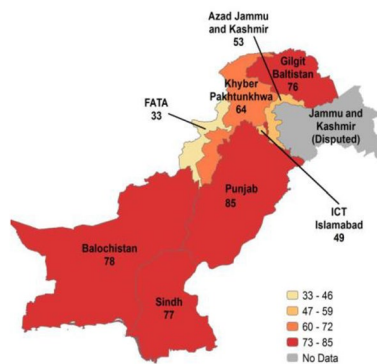


Fig. 2 Under-5 mortality by region. Deaths per 1000 live births for the 10-year period before the survey. Source: Pakistan Demographic Health Survey (PDHS) 2017–18

Figure 3 presents the fertility trends for Bangladesh and Pakistan from 1990–1991 to 2017. It is visible from Fig. 3 that both countries are showing a boom and bust kind of trend. Over the years, fertility rate has increased in Pakistan, while it has remained constant in Bangladesh. Repeated pregnancies reduce mother care, and lack of health facilities increases the mortality rate. Figure 4 provides the fertility trend based on background characteristics in both Bangladesh and Pakistan with the disaggregation into rural and urban regions. It is evident from the data that Bangladesh has a better provision of facilities than Pakistan; with enhanced and better provision of health facilities, this scenario has become possible to turn the situation completely different. In Pakistan, women are anemic, and births taking place at health facilities or in care of skilled health personnel are worse than those of Bangladesh. Hence, there is a dire need to monitor the progress and improve the health profile of married women (Mahmood & Bashir, 2012).

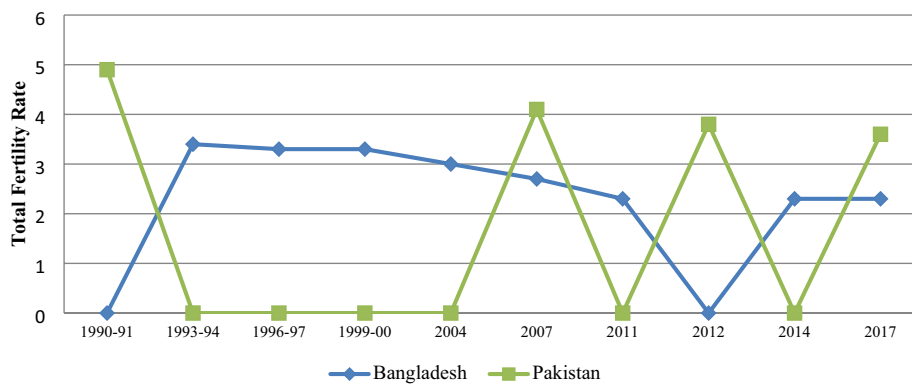


Fig. 3 Trends in fertility. Source: BDHS and PDHS 2017–18 (The years showing zero value for Pakistan depict the non-availability of the data)

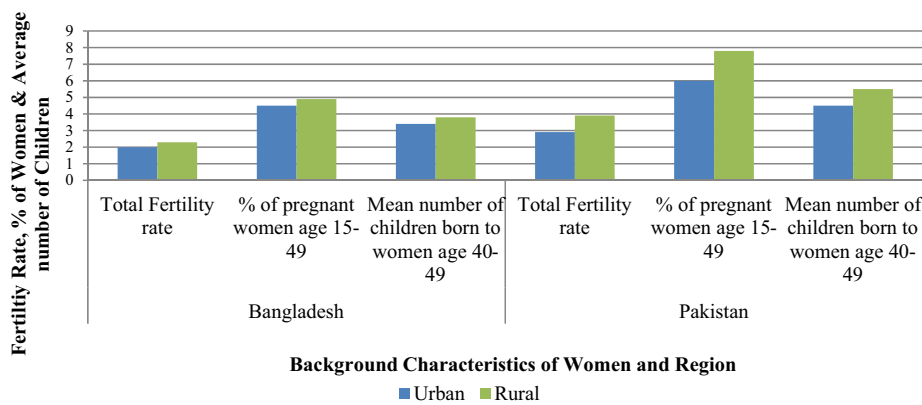


Fig. 4 Fertility by background characteristics. Source: BDHS and PDHS 2017–18

Table 1 Children ever born and living to all women. Source: BDHS and PDHS 2017–18

Age group	Bangladesh		Pakistan	
	Mean number of children ever born	Mean number of children living	Mean number of children ever born	Mean number of children living
15–19	0.24	0.23	0.07	0.06
20–24	1.05	1.01	0.65	0.59
25–29	1.9	1.8	1.91	1.74
30–34	2.62	2.43	3.22	2.98
35–39	3.09	2.86	4.0	3.69
40–44	3.53	3.16	4.92	4.46
45–49	3.89	3.4	5.31	4.72

Table 1 shows the average number of children born and alive to a woman belonging to different age groups. The average number of children born and alive is highest for women aged 45–49 years in both countries. For Bangladesh, the number of children is higher for women aged 15–29 years compared to Pakistan. In contrast, the average number of children is higher for women aged 30–49 years in Pakistan. Age is

one eloquent factor that affects women’s chance to conceive and have a healthy baby. Since women’s fertility and chances to conceive reduce as their age increases, putting her Health on the verge of life-threatening risk with late-age pregnancies.

Mortality under-5, infant mortality, and neo-natal mortality rates are offered in Fig. 5 for both countries. Over the years, childhood mortality rates have declined in both countries. The figures sharply decayed in Bangladesh, while it has slowly weakened over the years in Pakistan. The number of under-5 mortality has declined in Bangladesh from 134 to 45, whereas in Pakistan, it has reduced from 112 to 74. The neo-natal mortality rate has diminished in Bangladesh from 52 to 30, while in Pakistan, it has slowly fallen from 49 to 22. The infant mortality rate has dissolved in Bangladesh from 88 to 38, and the same has lapsed from 86 to 62 in Pakistan. The facts here present an adverse situation for higher child mortality rates in Pakistan. Many issues, such as low level of education, early marriages, malnourished, anemic women, lack of basic health facilities, and inadequate maternal and newborn care, push them to deliver a high percentage of preterm and low-birth-weight babies.

A devastating condition related to child mortality rates has been presented in Figs. 6 and 7 across gender and region. Compared to other child mortality rates, the under-5 mortality rate is higher in both countries across gender and region; however, the ratios are higher in Pakistan, i.e., 80 deaths for males and 68 deaths for females per 1000 live births. For Bangladesh, 48 deaths for males and 41 deaths for females per 1000 births. Region-wise, the under-5 mortality rate is higher in Pakistan for both regions. All the statistics related to child mortality rates are higher in rural Pakistan, whereas for Bangladesh, neo-natal mortality, under-5 mortality, and infant mortality are lower in rural areas. The increased mortality rate for children from birth till many factors fuel the age 5. Multiple aspects are playing their part in contributing to this upsetting situation; among them are lack of health facilities and uneducated and malnourished women, especially in rural areas of Pakistan, child mortality rates are higher.

Antenatal care of both countries is displayed in Table 2. The percentage of qualified doctors is higher, while the percentage of birth attendants is lower in urban regions of both countries. The percentage of midwives and lady health visitors is higher in

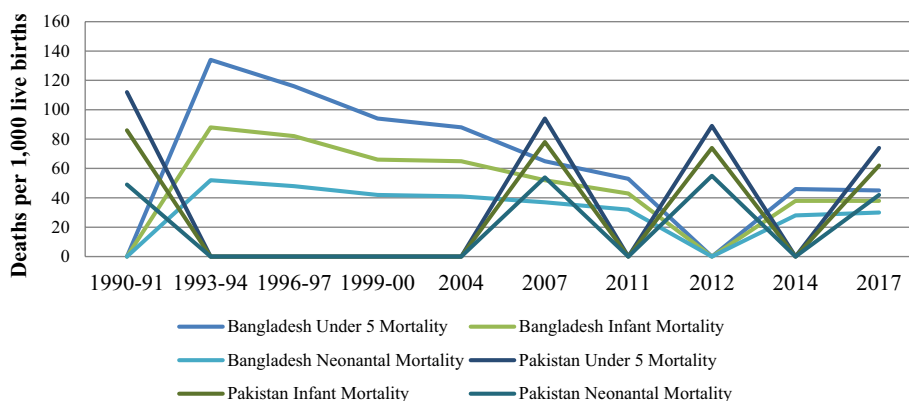


Fig. 5 Trends in early childhood mortality rates. Source: BDHS and PDHS 2017–18 (The years showing zero value for Pakistan depict the non-availability of the data)

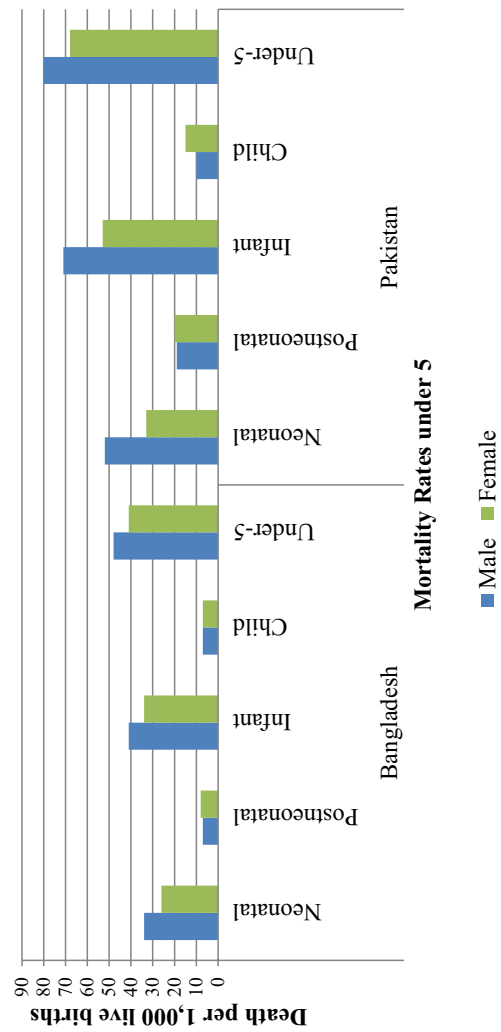


Fig. 6 Early child mortality rates across gender. Source: BDHS and PDHS 2017–18

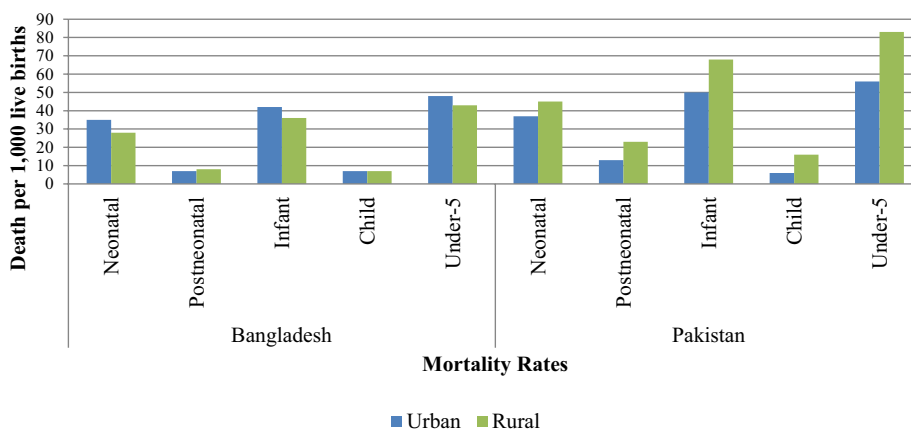


Fig. 7 Early child mortality rates across region. Source: BDHS and PDHS 2017–18

Bangladesh as they may be more experienced, and mothers may have experienced fewer deaths or child disorders. It is suggested by Zafar and Anwar (2009) for Pakistan that antenatal care could be further improved by creating awareness among impoverished women and provide them with benefits to access these services.

Tables 3 and 4 demonstrate the place of delivery and assistance during delivery in both countries. The percentage distribution of live births is higher in private hospitals in the urban region of both countries, while it is higher in homes in rural region of both countries. In both countries and regions, the percentage of qualified doctors is higher. The percentage of birth attendants is lower in both regions of Bangladesh and lower for lady health visitors in both regions of Pakistan. Since most private hospitals provide good nursing care to infants and mothers, most deliveries and assistance are provided to them there.

Health risks among women can be reduced by promoting safe delivery practices in terms of services required during pregnancy, birth attended by skilled health professionals, and place of delivery. Hence, it is crucial to see the increased level of prenatal

Table 2 Antenatal care. Source: BDHS and PDHS 2017–18

	Bangladesh				Pakistan			
	Qualified doctor	Nurse/ midwives	Lady health visitor	Birth attendant	Qualified doctor	Nurse/ midwives	Lady health visitor	Birth attendant
Urban	85.6	3.3	2	0.2	91.1	3.1	0.6	1
Rural	72.5	2.6	6.4	2.5	77.3	4.8	0.5	1

Table 3 Place of delivery. Source: BDHS and PDHS 2017–18

	Bangladesh					Pakistan			
	Home	Public	Private	NGO sector	Other	Home	Public	Private	Other
Urban	36.5	18.6	37.6	6.3	1	18.9	25.3	56	0
Rural	55	12.7	29.3	2.6	0.5	40.6	21.1	38	0.2

Table 4 Assistance during delivery. Source: BDHS and PDHS 2017–18

	Bangladesh				Pakistan			
	Qualified doctor	Nurse/midwives	Lady health visitor	Birth attendant	Qualified doctor	Nurse/midwives	Lady health visitor	Birth attendant
Urban	51.9	14.5	1.6	0.5	76.5	7.3	0.5	14
Rural	33.4	12.5	2.3	0.5	52	10.6	0.7	29

Table 5 Time of first post-natal checkup for mothers and newborn. Source: BDHS and PDHS 2017–18

Regions	Bangladesh		Pakistan	
	Medical checkup from trained doctor within 2 Days	No post-natal checkup	Medical checkup from trained doctor within 2 days	No post-natal checkup
a. Time of first post-natal checkup for mothers				
Urban	66	33.4	76	22
Rural	47	52.4	54.5	42.7
b. Time of first post-natal checkup for newborn				
Urban	65.6	33	77.3	21.1
Rural	47.3	51.3	57.4	41

consultation among married women which translates into improved practices of having births attended by skilled health professional (Mahmood & Bashir, 2012).

Table 5a and b displays the first post-natal checkup for mothers and newborns. The time of post-natal checkups for both mothers and newborns is higher in both regions of Pakistan than in Bangladesh. Over the years, due to higher child mortality rates, people are now more aware of the health of mothers and children, which has increased the percentage of checkups for both.

The trend in childhood vaccination is sketched in Fig. 8. Due to the past experiences of individuals and the initiatives taken by the government to create awareness regarding the importance of vaccination, the percentage of children who received vaccination has increased in both countries. Still, the situation in Pakistan is not very promising. However, the percentage of children who have not received any vaccination has declined, and if we compare the statistics of both countries, Pakistan is in the process of catching up with Bangladesh, providing another edge to Bangladesh over Pakistan. The mortality rate is higher in Pakistan because half of the children do not receive vaccination, and in 2015 around 500,000 children missed vaccination due to inaccessibility (UNICEF, 2015).

Table 6 presents vaccination by education of the mother. The percentage of vaccinated children in Bangladesh and Pakistan is higher whose mothers have received secondary or higher education. Mothers' education makes them more aware of the measures to take for their health, consequently increasing vaccination chances.

Prevalence and treatment of acute respiratory infection is offered in Table 7 for urban and rural areas of Pakistan and Bangladesh. The percentage of children who have received advice is higher in the urban regions of both countries. Table 7 depicts the

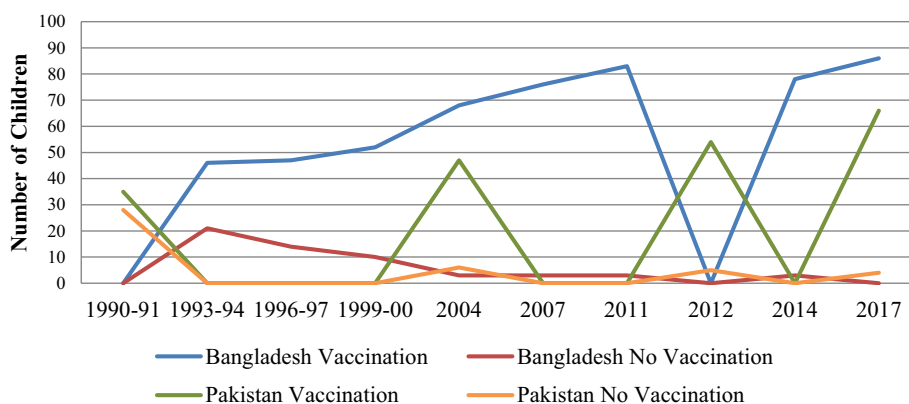


Fig. 8 Trends in childhood vaccination. Source: BDHS and PDHS 2017–18

Table 6 Vaccination by education of mother. Source: BDHS and PDHS 2017–18

Level of education	Bangladesh	Pakistan
No education	77	50
Primary	88	76
Secondary or higher	89	160

Table 7 Prevalence and treatment of acute respiratory infection (ARI). Source: BDHS and PDHS 2017–18

		Bangladesh			
	% with symptoms of ARI	% for whom advice/treatment was sought	% for whom advice/treatment was sought same or next day		
Urban	2.6	44.9	22.9		
Rural	3.2	38.9	21.3		
		Pakistan			
	% with symptoms of ARI	% for whom advice/treatment was sought	% for whom advice/treatment was sought same or next day	% who took antibiotic drugs	
Urban	12.8	87.4	57.4	46.1	
Rural	14.3	82.8	47.9	46.5	

prevalence and treatment of acute respiratory infection (ARI). In both countries, children with symptoms of ARI are higher in rural regions, and children who have received advice/treatment are higher in urban regions. Due to health facilities and awareness among people about ARI treatment is higher in urban areas, which has increased the percentage of children who have received treatment in these areas,

Prevalence and treatment of diarrhea across regions across different sectors for both countries is offered in Tables 8 and 9. The percentage of children who have sought treatment is higher in the urban region of both countries than in rural region as health facilities are higher in urban region. Therefore, the percentage of children who have sought treatment and who have received ORS treatment during diarrhea is higher in the private

Table 8 Prevalence and treatment of diarrhea. Source: BDHS and PDHS 2017–18

	Bangladesh		Pakistan	
	% with diarrhea	% for whom advice/treatment was sought	% with diarrhea	% for whom advice/treatment was sought
Urban	4.4	43.4	19.1	75
Rural	4.8	35.5	19.1	68.7

Table 9 Prevalence and treatment of diarrhea by sector. Source: BDHS and PDHS 2017–18

	Among children with diarrhea	Among children with diarrhea for whom advice or treatment was sought	Among children with diarrhea who received ORS
Bangladesh			
Public	13.3	15.4	15.5
Private	72.7	84	75
Other	2.6	2.9	2
Pakistan			
Public	13.6	19.2	22.4
Private	59.9	84.2	74.8
Other	1.4	2	1.4

sector of both countries. Proper care and attention is paid to the patients in private hospitals. Diarrhea is the second most significant cause of child mortality globally; each year it is responsible for 1.5 million child deaths globally (WHO, 1999).

Nutritional status of children

The nutritional status of children, micronutrient intake among children, and iron tablets/syrup taken by mothers during pregnancy are discussed in this section.

The nutritional status of children across Pakistan and Bangladesh is accessible in Fig. 9. Stunned, underweight, and wasted children are higher in Pakistan than in Bangladesh. Since the nutrition of children is essential for human development. Risk is posed to a child's physical and mental development, resulting in poor academic achievement. Adequate nutrition is indispensable, which ensures a robust immune system and proper physical and intellectual development in early childhood. It was found by Pappas et al. (2001) that the prevalence of diarrhea, nutritional deficiency, and anemia in Pakistan is 11.6%, 14.3%, and 66.4%, respectively. Khan (2006) analyzed that almost half of the children death are due to malnutrition in case of Pakistan.

Micronutrient intake among children in both countries is discussed in Table 10. The percentage of children aged 6–23 months and 6–59 months who have consumed different foods, supplements, and medicines is higher in Bangladesh. On the other hand, Table 11 shows the number of days women have taken iron tablets/syrups since their last birth. The percentage of women of both countries in rural and urban regions is higher for those who have never used iron tablets/syrups since their last birth and lower for women who have used it for 60–89 days. Compared to Bangladesh, the percentage of women who have never used iron tablets/syrups is higher in Pakistan. In case of Pakistan's rural

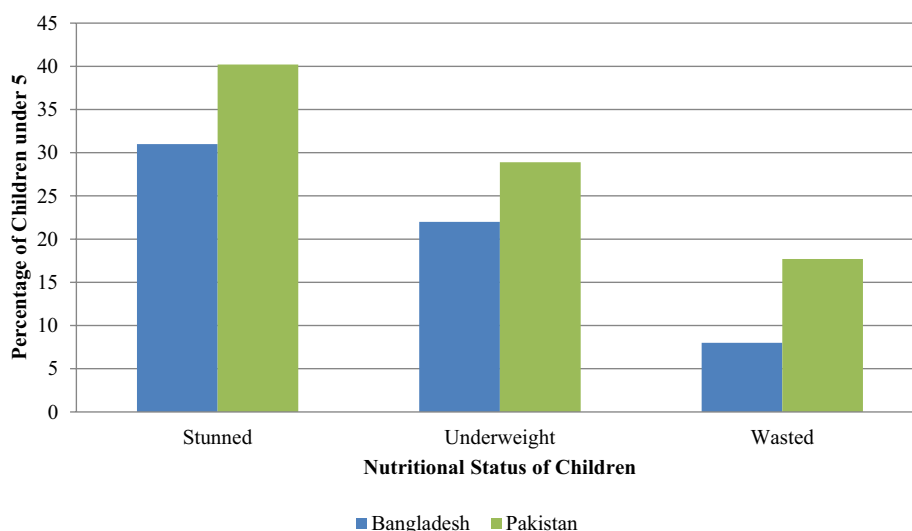


Fig. 9 Nutritional status of children across country. Source: BDHS and PDHS 2017–18

Table 10 Micronutrient intake among children. Source: BDHS and PDHS 2017–18

	Among youngest children age 6–23 months living with their mother		Among all children age 6–59 months		
	Percentage who consumed foods rich in vitamin A in last 24 h	Percentage who consumed foods rich in iron in last 24 h	Percentage given iron supplements in past 7 days	Percentage given vitamin A supplements in past 6 months	Percentage given deworming medication in past 6 months
Bangladesh					
Urban	78.8	73	6.4	78.6	47.7
Rural	75.8	68.3	5.9	79.5	45.1
Pakistan					
Urban	53.1	47.2	0.9	77.9	7
Rural	44.8	33.6	0.6	73.9	6.9

Table 11 Number of days women took iron tablets/syrup during pregnancy last birth. Source: BDHS and PDHS 2017–18

	None	< 60	60–89
Bangladesh			
Urban	21.7	17	8.8
Rural	27.6	19	9.2
Pakistan			
Urban	32.6	18	8.9
Rural	45.4	20	8.9

women and women belonging to the lower economic class suffer badly from undernutrition (WHO, 2010). The primary issue is about the awareness of the importance of micronutrients, since most women in Pakistan are unaware of these micronutrient intake and

Table 12 Source of drinking water (% distribution of household). Source: BDHS and PDHS 2017–18

	Urban	Rural
Improved water sources		
Bangladesh	99.4	97.9
Pakistan	96.7	93.4
Unimproved water sources		
Bangladesh	0.6	2.1
Pakistan	3.2	6.6

Table 13 Household sanitation facilities (% distribution of household). Source: BDHS and PDHS 2017–18

	Urban	Rural
Improved sanitation		
Bangladesh	75.1	61.5
Pakistan	87.7	58.1
Unimproved sanitation		
Bangladesh	24.8	36.6
Pakistan	12.2	41.9

tablets/syrups lack of education and health facilities, financial crises, and other socio-economic problems further add up to their difficulties.

Household conditions

Household conditions play a pivotal role in a child's health-related issues. A child belonging to a well-off family has access to better health facilities compared to those who do not possess the basic amenities. This section discusses the source of drinking water, sanitation facilities and cooking amenities in households, electricity connection, the number of people living in a household and the dependent's age groups, and educational attainment of male and female households. The chances are that these factors may influence the development of children in their later life. It is found that 110 deaths of children under 5 years age per day in Pakistan are due to water and sanitation disease. Around 36% population of Pakistan live without access to sanitation, and most of the population does not have access to clean drinking water (UNICEF, 2015). Unfortunately, lack of sanitation facilities is one of the primary cause of high child mortality, even though cleanliness is half the faith of Islam (Government of Pakistan, 2016). Child mortality can be reduced by improving drinking water, sanitation services, and better hygienic behaviors (WHO, 2010).

Tables 12, 13, 14 and 15 depict the drinking water source, sanitation facilities, cooking facilities, and electricity connection in households across different regions of both countries. The percentage of households using improved water resources is higher in both regions of Bangladesh. It was also found by Ali and Nasir (1990) that life expectancy at birth can be increased by 2 years if water-borne diseases are eliminated. Whereas for Pakistan, the percentage of households using improved water resources is lower, and the percentage of households using unimproved resources is higher in rural areas

Table 14 Cooking amenities (% of household). Source: BDHS and PDHS 2017–18

Bangladesh	Urban		Rural		Pakistan	Urban		Rural	
	Electricity	0.8	0.2	Electricity		0.2	0.1	LPG/natural gas	88.2
LPG/natural gas	55.4	5.7	Coal	0.1	0.2	Charcoal	0.8	2.8	0.1
Kerosene	0.1	0	Wood	8.3	61.1	Straw/shrubs/grass	0.1	1.9	0.1
Charcoal	0.1	0.1	Straw/shrubs/grass	0.1	2	Agricultural crops	0.1	2	0.1
Wood	30.3	49.2	Animal dung	1.4	4.9				
Straw/shrubs/grass	0.6	0.6							
Agricultural crops	10	35							
Animal dung	2.3	9.0							

Table 15 Electricity connection in households (% distribution of households). Source: BDHS and PDHS 2017–18

Bangladesh	Urban		Rural		Pakistan	Urban		Rural	
	National grid/solar	96.5	88.7	Yes		99.4	88.5	No	0.5
National grid	94.2	76.4							
Solar	4.8	19.2							
No connection	3.5	11.3							

Table 16 Household population by dependent age group. Source: BDHS and PDHS 2017–18

	Bangladesh				Pakistan			
	Urban		Rural		Urban		Rural	
	Male	Female	Male	Female	Male	Female	Male	Female
Age < 5	10.3	9.5	11.6	9.4	11.8	11.5	14.1	13.9
Age 5–14	20.6	19.9	23.6	21.6	22.9	23	25.6	24.9
Age 60+	9.2	6.8	12.2	9.1	7	6.1	8	5.8

of Pakistan. Compared to Bangladesh, the percentage of households using improved sanitation facilities is higher in Pakistan. Households using natural gas are higher in the urban region of Bangladesh and Pakistan, while households using wood are higher in rural regions of Bangladesh and Pakistan. Households having electricity connection is higher in both regions of Pakistan and Bangladesh. Gas electricity connection, cooking amenities, and sanitation facilities are basic amenities of life, but the majority of households in Pakistan do not have the privilege of these amenities. It was found by Ali (2001) that accessibility can measure the socioeconomic status of a person to various amenities as it may reduce child mortality.

The dependent population of Households is presented in Table 16 as it is the main factor that may affect children's educational expenditures, household expenditures, and labor market participation in later life. In both countries, dependent population of children aged 5–14 years is higher in rural regions. As the population of the

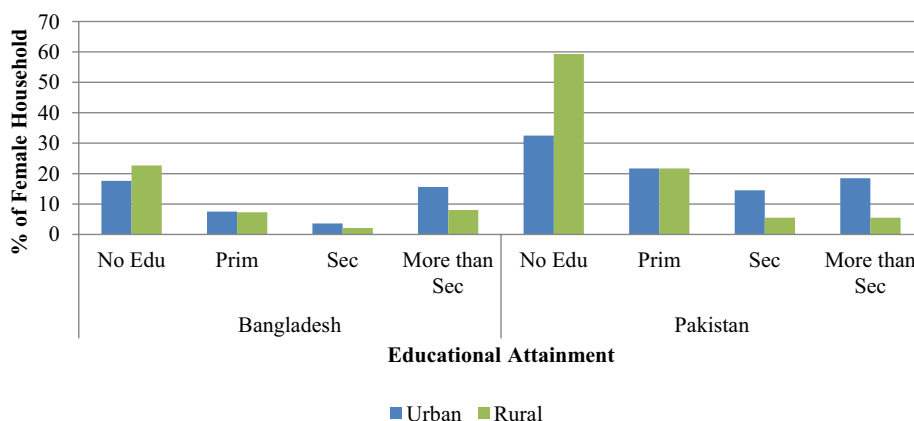


Fig. 10 Educational attainment of female household. Source: BDHS and PDHS 2017–18

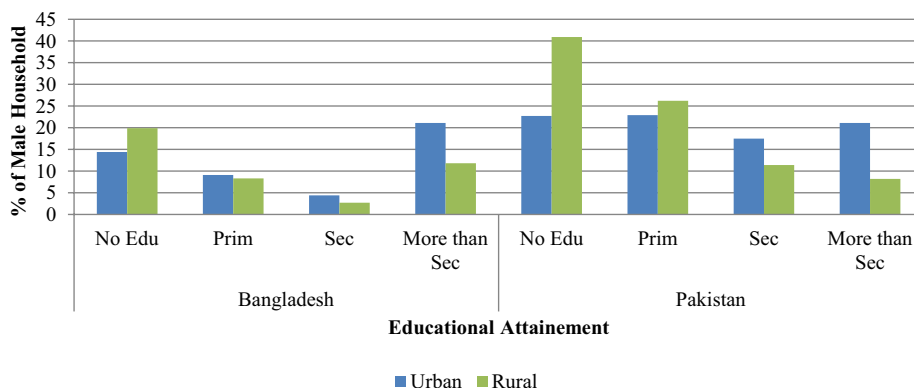


Fig. 11 Educational attainment of male household. Source: BDHS and PDHS 2017–18

above-mentioned age group increases, their chances of children development may decline as households may be facing socioeconomic problems.

Figures 10 and 11 present the educational attainment of female and male households. Compared to Bangladesh, illiterate females are higher in both regions of Pakistan. Females who have attained more than secondary education are higher in the urban region of Pakistan, while in the case of Bangladesh, females who have attained more than secondary education are higher in rural regions. The percentage of illiterate males is higher in Pakistan than in Bangladesh. The percentage of males who have attained more than secondary education is higher in both regions of Bangladesh, while in the case of Pakistan percentage of males who have attained primary education is higher. In Pakistan, by increasing the educational attainment of both males and females, they will become aware of health issues and nutrition of women and children, which may reduce child mortality, child diseases and disorders, and repeated pregnancies. Hence, a more prosperous and healthy society would be created.

Conclusion and policy recommendations

This study aimed to evaluate the healthcare provision and associated issues for children and women, particularly during and after pregnancy, to assess the health conditions in Bangladesh and Pakistan. The motivation for this comparative analysis stemmed from the remarkable economic progress of Bangladesh among South Asian countries, surpassing its neighboring countries in terms of economic growth and advancements in healthcare services. This research has explicitly examined the disparities between Pakistan and Bangladesh, aiming to identify the key factors contributing to Bangladesh's remarkable GDP growth. Moreover, it endeavors to offer recommendations to policymakers in Pakistan, urging them to adopt similar strategies based on the proven outcomes of a country that has faced comparable financial and economic circumstances in the recent past.

This study's analysis is structured into three primary categories, drawing upon government-published reports. These categories encompass assessing health conditions, nutrition status, and household conditions. The comprehensive comparison between Pakistan and Bangladesh has revealed a significant disparity, with Pakistan falling behind in every aspect of healthcare facilities provided to its citizens. The analysis highlights the pressing need for the government of Pakistan to undertake substantial efforts to bring about improvements in these areas. The findings underscore the urgency for Pakistan to address the existing gaps and prioritize the enhancement of healthcare services for its population.

During the assessment of health conditions, it was discovered that the fertility rate in Pakistan has shown a significant increase over the years, whereas it has remained stable in Bangladesh. The study also highlighted a concerning situation regarding higher child mortality rates in Pakistan. Numerous factors contribute to this issue, including a low level of education, early marriages, malnourishment, anemia among women, inadequate access to basic health facilities, and insufficient maternal and newborn care. Consequently, a considerable proportion of preterm and low-birth-weight babies are being delivered. Furthermore, Pakistan exhibits a higher under-5 mortality rate compared to Bangladesh. The increased mortality rate for children from birth to the age of 5 is influenced by several factors. The nonexistence of health facilities, lack of education, and malnutrition among women, particularly in rural Pakistan, are prominent contributors to the elevated child mortality rates. The findings from the assessment of health conditions underscore the urgent need for policy interventions in both Pakistan and Bangladesh. In Pakistan, addressing the factors contributing to high fertility rates, such as promoting education, delaying marriages, and improving women's health, is crucial. In addition, prioritizing basic health facilities and enhancing maternal and newborn care are essential to reducing preterm births and low-birth-weight babies.

The study reveals a significant disparity in the distribution of live births, with a higher percentage occurring at home in rural areas of both countries compared to private hospitals, public hospitals, and NGOs. Hence, it is recommended to implement safe delivery practices that prioritize utilizing necessary services throughout pregnancy, ensuring that skilled health professionals attend births and take place in appropriate facilities. Encouraging married women to seek prenatal consultations is crucial as it leads to improved practices and increases the likelihood of having skilled health professionals present during childbirth.

Moreover, the study unveiled a higher prevalence of stunted, underweight, and wasted children in Pakistan than in Bangladesh. In addition, the utilization of dietary supplements and medications among children aged 6–23 months and 6–59 months is lower in Pakistan than in Bangladesh. These findings highlight the urgent need for targeted policy interventions in Pakistan that promote adequate nutrition, including the provision of dietary supplements and medicines, to improve the health outcomes of children. In addition, investing in nutrition-focused programs and initiatives can help mitigate the prevalence of stunting, underweight, and wasting in Pakistan.

Likewise, Pakistan exhibits a higher percentage of women who have never utilized iron tablets or syrups than Bangladesh. Specifically, rural women and those from lower economic backgrounds in Pakistan experience significant challenges related to undernutrition. The lack of awareness regarding micronutrient intake, limited access to education and healthcare, financial constraints, and various socioeconomic issues compound women's difficulties in Pakistan. Therefore, addressing these multifaceted barriers through improved education, enhanced healthcare provision and targeted support for vulnerable populations is imperative.

When examining housing conditions, it becomes evident that access to gas and electricity connections, proper cooking facilities, and sanitation amenities are fundamental necessities of life. Unfortunately, the majority of households in Pakistan lack these essential amenities. Similarly, when comparing with Bangladesh, the study reveals higher illiteracy rates among males and females in all regions of Pakistan. By prioritizing educational advancement for both genders in Pakistan, awareness regarding health issues and proper nutrition for women and children can be raised. This, in turn, can potentially reduce child mortality, instances of childhood diseases and disorders, and unplanned pregnancies. Ultimately, these efforts contribute to creating a more prosperous and healthy society.

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Author contributions

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Availability of data and materials

All the data that have been used in this study are collected from public data sources. Moreover, all the graphs and charts have mentioned the source of data under their sub-heading.

Declarations

Competing interests

This study does not have a competing interest with any institution or organization.

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References

- Abdullah, K., Malek, M. A., Faruque, A. S. G., Salam, M. A., & Ahmed, T. (2007). Health and nutritional status of children of adolescent mothers: experience from a diarrhoeal disease hospital in Bangladesh. *Acta Paediatrica*, *96*, 396–400.
- Akombi, B. J., Agho, K. E., Merom, D., Renzaho, A. M., & Hall, J. J. (2017). Child malnutrition in sub-Saharan Africa: a meta-analysis of demographic and Health surveys (2006–2016). *PLoS ONE*, *12*(5), e0177338.

- Ali, A. (2021). Current status of malnutrition and stunting in Pakistani children: what needs to be done? *Journal of the American College of Nutrition*, 40(2), 180–192.
- Ali, A., & Hussain, S. A. (2021). The impact of household socio-economic status on child stunting in Pakistan. *All papers published in the PROCEEDINGS were accepted after formal peer review by the experts in the relevant field.*, p. 93
- Ali, S. M., & Nasir, Z. M. (1990). Gains in life expectancy by elimination of specified causes of death in Pakistan. *The Pakistan Development Review*, 29, 4.
- Anik, A. I., Chowdhury, M. R. K., Khan, H. T., Mondal, M. N. I., Perera, N. K., & Kader, M. (2021). Urban-rural differences in the associated factors of severe under-5 child undernutrition based on the composite index of severe anthropometric failure (CISAF) in Bangladesh. *BMC Public Health*, 21(1), 1–15.
- Anwar, S., Nasreen, S., Batool, Z., & Husain, Z. (2013). Maternal education and child nutritional status in Bangladesh: Evidence from demographic and health survey data. *Pakistan Journal of Life and Social Sciences*, 11(1), 77–84.
- Asim, M., & Nawaz, Y. (2018). Child malnutrition in Pakistan: Evidence from literature. *Children*, 5(5), 60.
- Babar, N. F., Muzaffar, R., Khan, M. A., & Imdad, S. (2010). Impact of socio-economic factors on nutritional status in primary school children. *Journal of Ayub Medical College Abbottabad*, 22(4), 15–18.
- Blakely, T., Hales, S., Prüss-Üstün, A., Campbell-Lendrum, D. H., Corvalán, C. F., Woodward, A., World Health Organization. (2004). *Poverty: assessing the distribution of health risks by socio-economic position at national and local levels*. World Health Organization.
- Braveman, P., & Gruskin, S. (2003). Defining equity in health. *Journal of Epidemiology and Community Health*, 57(4), 254–258.
- Brunori, P., Palmisano, F., & Peragine, V. (2016). *Inequality of opportunity in sub-Saharan Africa*. The World Bank.
- Caldwell, J. C., Caldwell, B., Pieris, I., & Caldwell, P. (1999). The Bangladesh fertility decline: An interpretation. *Population and Development Review*, 25(1), 67–84.
- Chen, X.-K., Wen, S. W., Fleming, N., Demissie, K., Rhoads, G. G., & Walker, M. (2007). Teenage pregnancy and adverse birth outcomes: A large population based retrospective cohort study. *International Journal of Epidemiology*, 36, 368–373.
- Chowdhury, M. R. K., Khan, H. T., Rashid, M., Kabir, R., Islam, S., Islam, M. S., & Kader, M. (2021). Differences in risk factors associated with single and multiple concurrent forms of undernutrition (Stunting, wasting or underweight) among children under 5 in Bangladesh: A nationally representative cross-sectional study. *British Medical Journal Open*, 11(12), e052814.
- Cleland, J., Phillips, J. F., Amin, S., & Kamal, G. M. (1994). *The determinants of reproductive change in Bangladesh* (Vol. 72, pp. 1–55). The World Bank.
- Dabalen, A., Narayan, A., Saavedra-Chanduvi, J., & Hoyos, S. A. (2014). *Do African children have an equal chance?: A human opportunity report for sub-Saharan Africa*. The World Bank.
- De, P., & Chattopadhyay, N. (2019). Effects of malnutrition on child development: Evidence from a backward district of India. *Clinical Epidemiology and Global Health*, 7(3), 439–445.
- Dibley, M. J., Roy, S. K., Senarath, U., Patel, A., Tiwari, K., Agho, K. E., Mihrshahi, S., South Asia Infant Feeding Research Network (SAIFRN). (2010). Cross-country comparisons of selected infant and young child feeding indicators and associated factors in four South Asian countries. *Food and Nutrition Bulletin*, 31(2), 366–379.
- Giashuddin, M. S., Kabir, M., & Hasan, M. (2005). Economic disparity and child nutrition in Bangladesh. *The Indian Journal of Pediatrics*, 72(6), 481–487.
- Giashuddin, S. M., Rahman, A., Rahman, F., Mashreky, S. R., Chowdhury, S. M., Linnan, M., & Shafinaz, S. (2009). Socio-economic inequality in child injury in Bangladesh—implication for developing countries. *International Journal for Equity in Health*, 8(1), 1–8.
- Government of Pakistan. (2016). *Multidimensional poverty in Pakistan*. Planning Commission of Pakistan.
- Hasan, M. M., Uddin, J., Pulok, M. H., Zaman, N., & Hajizadeh, M. (2020). Socio-economic inequalities in child malnutrition in Bangladesh: do they differ by region? *International Journal of Environmental Research and Public Health*, 17(3), 1079.
- Heath, R., & Mobarak, A. M. (2015). Manufacturing growth and the lives of Bangladeshi women. *Journal of Development Economics*, 115, 1–15.
- Iram, U., & Butt, M. S. (2006). Understanding the health and nutritional status of children in Pakistan: A study of the interaction of socio-economic and environmental factors. *International Journal of Social Economics*. <https://doi.org/10.1108/03068290610642210>
- Jonah, C. M. P., Sambu, W. C., & May, J. D. (2018). A comparative analysis of socio-economic inequities in stunting: A case of three middle-income African countries. *Arch Public Health*, 76(1), 77.
- Kar, B. R., Rao, S. L., & Chandramouli, B. A. (2008). Cognitive development in children with chronic protein energy malnutrition. *Behavioral and Brain Functions*, 4(1), 31.
- Karim, M., Al Mamun, A. S. M., Rana, M., Mahumud, R. A., Shoma, N. N., Dutt, D., & Hossain, M. (2021). Acute malnutrition and its determinants of preschool children in Bangladesh: gender differentiation. *BMC Paediatrics*, 21(1), 1–10.
- Khan SK. Social determinants of health in Pakistan: The glass is more than half empty. World Health Organization; 2006. <http://www.gis.emro.who.int/>
- Khan, G. N., Turab, A., Khan, M. I., Rizvi, A., Shaheen, F., Ullah, A., Hussain, A., Hussain, I., Ahmed, I., Yaqoob, M., & Ariff, S. (2016). Prevalence and associated factors of malnutrition among children under-five years in Sindh, Pakistan: a cross-sectional study. *BMC Nutrition*, 2(1), 1–7.
- Khatun, W., Rasheed, S., Alam, A., Huda, T. M., & Dibley, M. J. (2019). Assessing the intergenerational linkage between short maternal stature and under-five stunting and wasting in Bangladesh. *Nutrients*, 11, 1818.
- Laghari, Z. A., Soomro, A. M., Tunio, S. A., Lashari, K., Baloach, F. G., Baig, N. M., & Bano, S. (2015). Malnutrition among children under five years in district Sanghar, Sindh, Pakistan. *Gomal Journal of Medical Sciences*, 13(1), e570.
- Mahmood and Bashir (2012), Applying an Equity Lens to Maternal Health Care Practices in Pakistan. PIDE Working Paper. [p. 83]
- Mehmood, Z., Afzal, T., Khan, N., Ahmed, B., Ali, L., Khan, A., Muhammad, J., Khan, E. A., Khan, J., Zakki, S. A., & Xu, J. (2021). Prevalence and determinants of Stunting among preschool and school-going children in the flood-affected areas of Pakistan. *Brazilian Journal of Biology*, 82, e249971.

- Nuruddin, R., Lim, M. K., Hadden, W. C., & Azam, I. (2009). Comparison of estimates of under-nutrition for pre-school rural Pakistani children based on the WHO standard and the National Center for Health Statistics (NCHS) reference. *Public Health Nutrition*, 12(5), 716–722.
- Pappas, G., Akhtar, T., Gergen, P. J., Hadden, W. C., & Khan, A. Q. (2001). Health status of the Pakistani population: A health profile and comparison with the United States. *American Journal of Public Health*, 91(1), 93.
- Park, H., Bothe, D., Holsinger, E., Kirchner, H. L., Olness, K., & Mandalakas, A. (2011). The impact of nutritional status and longitudinal recovery of motor and cognitive milestones in internationally adopted children. *International Journal of Environmental Research and Public Health*, 8(1), 105–116.
- Pulok, M. H., Sabah, M. N. U., & Enemark, U. (2016). Socio-economic inequalities of child malnutrition in Bangladesh. *International Journal of Social Economics*. <https://doi.org/10.1108/IJSE-03-2015-0065>
- Reinbold, G. W. (2011). Economic inequality and child stunting in Bangladesh and Kenya: An investigation of six hypotheses. *Population and Development Review*, 37(4), 691–719.
- Saheed, R., Hina, H., & Shahid, M. (2021). Water, sanitation, and malnutrition in Pakistan: challenge for sustainable development. *Global Economics Review*, 6, 1–14.
- Sanoussi, Y., Ahinkorah, B. O., Banke-Thomas, A., & Yaya, S. (2020). Assessing and decomposing inequality of opportunity in access to child health and nutrition in sub-Saharan Africa: evidence from three countries with low human development index. *International journal for equity in health*, 19, 1–16.
- Senarath, U., Agho, K. E., Akram, D. E. S., Godakandage, S. S., Hazir, T., Jayawickrama, H., & Dibley, M. J. (2012). Comparisons of complementary feeding indicators and associated factors in children aged 6–23 months across five South Asian countries. *Maternal and Child Nutrition*, 8, 89–106.
- Syeda, B., Agho, K., Wilson, L., Maheshwari, G. K., & Raza, M. Q. (2021). Relationship between breastfeeding duration and undernutrition conditions among children aged 0–3 Years in Pakistan. *International Journal of Pediatrics and Adolescent Medicine*, 8(1), 10–17.
- Uddin, J., Pulok, M. H., Johnson, R. B., Rana, J., & Baker, E. (2019). Association between child marriage and institutional delivery care services use in Bangladesh: Intersections between education and place of residence. *Public Health*, 171, 6–14.
- UNESCO. (2006). *Strong foundations: Early childhood care and education. Efa global monitoring report, 2007* (2nd ed.). UNESCO.
- UNICEF. (2015). *Pakistan annual report 2015*. UNICEF.
- UNICEF. (2019). *The state of the world's children 2019, children, food and nutrition: growing well in a changing world*. UNICEF.
- WHO. (2010). *World health statistics report*. WHO.
- World Health Organization. The World Health Report: Making a Difference; 1999. Retrieved December 10, 2012, from <http://www.who.int/whr/1999/en/>
- Zafar, R., & Anwar, A. (2009). Unintended pregnancy and antenatal care in Pakistan. In S. M. Ali (Ed.), *Women and children health: An in-depth analysis of 2006–07*. National Institute of Population Studies.
- Zahangir, M. S., Hasan, M. M., Richardson, A., & Tabassum, S. (2017). Malnutrition and non-communicable diseases among Bangladeshi women: An urban–rural comparison. *Nutrition & Diabetes*, 7(3), e250–e250.

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