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RESEARCH PAPER

Hypertension Hindrance: Unraveling the Impact on Bangladesh's Economic Development

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ABSTRACT

In Bangladesh, hypertension, sometimes referred to as hypertension, has become a serious public health concern that is having a considerable negative impact on the nation's ability to prosper economically. Bangladesh's expanding economy has advanced significantly in many areas during the past few decades. Concerns have been expressed concerning the influence of hypertension on the nation's overall well-being due to its rising prevalence. This study examines the complex nature of Bangladesh's hypertension epidemic, considering both economic and medical factors. This study mainly based on secondary data, using the narrative review paper as a guide, observed at the epidemiological trends of hypertension in Bangladesh, emphasizing its upward tendency across all age groups and socio-economic classes. After that, saw at the financial effects of hypertension, including the direct expenses of medical care and treatment as well as the indirect costs of decreased productivity and higher mortality. This financial burden may impede a nation's efforts to achieve sustainable development. Additionally, investigate the determinants of hypertension in Bangladesh, taking into consideration dietary practices, genetic predisposition, lifestyle factors, and access to medical treatment. The important factors influencing the prevalence of hypertension are also explored, including socio-economic inequalities and urban-rural divisions. Designing successful interventions and policies requires an understanding of these drivers. Finally, communicated about possible methods for lowering the prevalence of hypertension in Bangladesh, highlighting the need of early detection, prevention, and health promotion. The study's findings indicated that Bangladesh's economic progress is hampered by hypertension. As we support expanding economic development, the importance of governmental policies, healthcare infrastructure, and public awareness campaigns in tackling these developing health concerns was taken into consideration. The study will underline how urgent it is to address high blood pressure as a significant impediment to Bangladesh's economic development. This study intends to offer insights that help guide evidence-based policies and initiatives to enhance the country's economic and health well-being by thoroughly examining the sources and effects of this understanding.

HIGHLIGHTS

- The healthcare system is heavily impacted by the increased incidence of hypertension. It requires more funding for management, diagnosis, and treatment, taking money away from other important health issues.
- Uncontrolled hypertension increases the risk of heart disease and stroke, which lowers working-age population productivity through disability and absenteeism as well as early death.
- Significant financial pressure is caused by the direct and indirect costs of hypertension, which include medical bills, lost productivity, and the toll that caring for an affected person takes on families.

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- Due to higher healthcare costs, families with high blood pressure frequently experience financial difficulties that lower their level of living and may even prolong the poverty cycle.
- The prevalence of hypertension and its financial burden can be decreased by putting preventive measures into place, such as public health campaigns, education about healthy lifestyle choices, and improved access to healthcare facilities.
- The implementation of policies that prioritise early identification, cost-effective treatment alternatives, and lifestyle adjustments can greatly reduce the financial impact of hypertension while simultaneously enhancing public health outcomes.

Keywords: Hypertension, Hindrance, Unraveling, Impact, Bangladesh, Economic Development.

Bangladesh, a South Asian nation that is developing quickly, has seen notable economic progress in recent years (Islam, M.R. 2019). Along with an increase in exports, the nation is also moving toward a digital economy through the growth of the textile and apparel industry, the agriculture sector, the country's foreign exchange reserves from expatriates, the development of the nation's infrastructure, the communication system, the information technology sector, and the outsourcing industry (The World Bank, 2014; Adnan, A. T.M. *et al.* 2015). But along with economic growth has come an increase in the prevalence of hypertension, which presents a serious threat to both public health and economic stability in the modern day. The nation's economic progress is likely to stall if governments and healthcare systems are unable to adjust to these problems and guarantee the health of their populace. Thus, investigating the causes of the impact of hypertension on Bangladesh's economic growth is crucial and calls for both changing people's personal habits and enhancing the health care system in the nation. Blood pressure monitoring, frequent check-ups with medical professionals, and following treatment regimens are crucial for controlling high blood pressure and lowering the health risks it entails. Because it consumes resources, lowers worker productivity, and widens economic inequality, hypertension may actually hinder Bangladesh's economic progress. A comprehensive strategy that incorporates investments in preventive and management, public health initiatives, and system enhancements in healthcare is needed to address this load.

Problem of the Statement

In Bangladesh, hypertension is a significant health concern with far-reaching implications for economic development. The rising incidence of hypertension is a major burden to Bangladesh's economic development (Koly, K.N. *et al.* 2015), negatively affecting the nation's health system, labor force participation, and general socio-economic well-being. The development of effective mitigation and preventative solutions for this issue necessitates a thorough investigation of the underlying causes (Sarver, T. *et al.* 2013). The prioritization of health sector improvement initiatives by government policies is crucial in mitigating the adverse effects of hypertension on the nation's economic growth and development. Bangladesh also has to investigate a complete strategy that includes investing in preventative health care systems, expanding health insurance coverage, enhancing health care infrastructure, and educating people about hypertension in order to handle new challenges. In addition, addressing the underlying social determinants of health is necessary to lessen the total impact of hypertension on the nation's economic development.

Objective of the Study

1. To investigate and evaluate Bangladesh's high blood pressure prevalence and its causes in relation to the nation's economic development;
2. To draw attention to the necessity of preventive and health promotion, as well as possible ways to lower the prevalence of hypertension in Bangladesh;
3. To provide recommendations for the formulation of policies regarding Bangladesh's high rate of hypertension and its possible effects on the country's economic development.

METHODS

We evaluate the economic impacts of hypertension on individuals and the healthcare system by

comprehending the socio-economic and cultural elements that affect the management and prevention of hypertension. To find trends, correlations, and causal links between hypertension and economic development in Bangladesh, the study combined quantitative and qualitative data using mixed-method analysis techniques. To validate results from many data sources, triangulation may be used in this situation. In the Rangpur district in Northern Bangladesh, 982 individuals voluntarily gave primary data, which was gathered at random. The districts of Kurigram to the east, Dinajpur to the west, Nilphamari to the north, and Gaibandha to the south encircle the Rangpur district. The two smallest administrative units in the Rangpur district are the Gangachra Union and Manohar Chawrapara Ward. A basic random sample technique was used to choose 26 paras, villages, and mahallas from two areas. A standardized questionnaire was used to conduct in-person interviews with every participant who lived in the chosen area to collect data. As a result, 982 individuals were included in the sample size data that was gathered from Rangpur district locales.

A descriptive overview search of the literature was conducted between January 2020 and December 2022 using a combination of literature searches from reputable texts, databases, PubMed, Google Scholar, ResearchGate, Web of Science, and IEEE Xplore. Articles that did not fit within the parameters of the search were excluded. We have gathered financial information about healthcare expenses, lost productivity, and the total financial impact of hypertension. We also examine current economic statistics, such as the cost of healthcare for treating hypertension.

The respondent's characteristics were determined by the application of univariate classification analysis. Determine the correlations between development indicators, economic factors, and the prevalence of hypertension using statistical techniques (such as regression analysis). Examine the relationships between measures of economic progress and rates of hypertension. Validate and enhance the overall understanding by contrasting and comparing the results of the quantitative and qualitative phases. To find recurrent themes, patterns, and socio-economic and cultural factors influencing the prevention and management of hypertension, qualitative data were subjected to content analysis. Make use of health questionnaires and consistent blood pressure testing techniques. To guarantee representation, choose participants at random from a range of demographic categories. Some objective measures were also evaluated namely height, weight. From weight and weight, Body Mass Index (BMI) was measured based on the following formula:

$$BMI = \text{Weight (in kilogram)} / \text{Height (in meter)}^2$$

BMI was grouped as thin with BMI < 18.5, normal with BMI = 18.5-24.9, overweight/obese with BMI ≥ 25.0.

Ethical Assessment

Ensure ethical considerations in data collection, particularly regarding confidentiality and informed consent.

RESULTS AND DISCUSSION

The sociodemographic, lifestyle, and hypertension related characteristics of the respondents are shown in Table 1. This study included a total of 982 respondents. About 22.3% respondents had no education, 54.1 %of the respondents were male, and 45.2% of the respondents were between the ages of 18 and 34 years. About 61.4% of respondents reported having jobs, 65.3% of the respondents lived in rural areas. Regarding marital status, about 90.3% of the respondents were currently married.

Regarding the smoking status, nearly 68% of the respondents were not currently smoking. BMI calculations showed that 14.1% of the respondents were overweight/obese, 58.6% were normal weight, and 27.3% were underweight. The prevalence of hypertension in our sample study was 21.5% (Table 1).

Table 1: Sociodemographic, lifestyle, and hypertension related characteristics among the respondents in Rangpur district of Bangladesh (n=982)

Background Characteristics	N	%
Age group		
18-34	443	45.2
35-39	113	11.4
40-44	85	8.7

45-49	81	8.3
50-54	55	5.6
55-59	56	5.7
60-64	55	5.6
65+	94	9.5
Education		
No education	219	22.3
Primary	287	29.2
Secondary	330	33.6
Higher	146	14.9
Gender		
Male	531	54.1
Female	451	45.9
Currently working		
No	379	603
Yes	38.6	61.4
Currently married		
No	95	887
Yes	9.7	90.3
Currently smoke		
No	666	67.8
Yes	316	3202
Residence		
Rural	641	65.3
Urban	341	34.7
BMI		
Underweight	268	27.3
Normal	575	58.6
Overweight/obese	139	14.1
Hypertension		
No	770	78.5
Yes	212	21.5

Multivariable analyses

Association between hypertension prevalence with sociodemographic and lifestyle related covariates

The AORs of the relationship between Association between hypertension prevalence with sociodemographic and lifestyle related covariates in our study sample is shown in Table 2.

Table 2: Factors associated with hypertension in adults aged ≥18 years in Rangpur district of Bangladesh (n=982)

Characteristics	AOR	95% CI
Age group		
18-34	1.00	—
35-39	2.01[a]	1.76-2.21
40-44	2.21[a]	2.01-2.52
45-49	2.52[a]	2.32-3.21
50-54	3.31[a]	2.89-3.78
55-59	3.56[a]	3.12-4.11
60-64	3.99[a]	3.42-4.63
65+	4.45[a]	4.12-5.59
Education		
No education	1.00	—
Primary	1.11	0.81-1.78
Secondary	1.21	1.10-1.91
Higher	1.10	0.78-1.81
Gender		
Male	1.00	—
Female	1.14[a]	1.06-1.26
Currently working		
No	1.00	—
Yes	0.92	0.87-1.10
Currently married		
No	—	—
Yes	1.16	0.81-1.67
Currently smoke		
No	1.00	—
Yes	0.82	0.31-1.21
Residence		
Rural	1.00	—
Urban	1.06	0.97-1.23
BMI		
Normal	1.00	—
Underweight	0.41[a]	0.31-0.78
Overweight/obese	1.62[c]	1.10-2.41

Note: *AOR = adjusted odds ratio; CI = confidence interval; Here a, b, and c indicates P<0.001, P<0.01, and P<0.05*

Respondents aged 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, and 65+ years had significantly higher risk of getting hypertension than those aged 18-34 years. Female were 1.14 times (95% CI 1.06-1.26) more likely to get hypertension as compared to their male counterparts. Underweight respondents were 0.41 times (95% CI 0.31-0.78) less likely to get hypertension as compared to the normal weight respondents. On the other hand, overweight/obese respondents were 1.62 times more likely to get hypertension (95% CI 1.10-2.41) than the normal weight respondents (Table 2).

Economic Impact of HTN

The state of the health care system is concerning in 2021, as nearly 4.5 billion people—more than half of

the world's population—do not have access to any form of health care, and 2 billion people—including 1 billion who face catastrophic health costs—face financial hardship as a result of their out-of-pocket medical expenses in 2019. Furthermore, 300 million people suffer from extreme poverty (WHO, 2023).

Substantial improvements are required in Bangladesh's healthcare infrastructure before new technologies can be successfully implemented and run. In order to enable technology-based treatments, this entails modernising hospitals, educating medical personnel, and guaranteeing dependable power sources. Since there is a lack of sufficient data on Bangladesh's health sector, the study makes use of data from the WHO and nearby nations. Over the course of the last nine months, about 19,000 citizens of 15 Indian states have been surveyed by an audit firm named "Heart Study". According to the audit's findings, this syndrome affects 17% of patients with disguised hypertension. White coat hypertension is the opposite, which can also happen and affects 23% of the population. Variations in blood pressure can be attributed to several factors such as job environment, family dynamics, depression, stress, and so forth. This poll also revealed that people's blood pressure in this nation is greater in the evening than it is in the morning (Anandho Bazar online Kolkata, 2019).

Bangladesh, a South Asian country with a population of over 160 million (Mondol, H. *et al.* 2018) has experienced substantial economic growth over the last few decades. Key drivers of this development include the textile industry, remittances from the Bangladeshi diaspora (Etzold, B. & Mallick, B. 2015), and improvements in the agriculture and manufacturing sectors. The country's Gross Domestic Product (GDP) has been steadily increasing, which has led to a rise in per capita income and an overall improvement in living standards. The following is the correlation between hypertension and economic development in Bangladesh

Hypertension in Bangladesh: Hypertension, or high blood pressure, is a significant health issue globally and in Bangladesh (Chowdhury, M.A.B. *et al.* 2016). Several factors contribute to its prevalence, including dietary habits, sedentary lifestyles, genetics, and access to healthcare. The rising incidence of hypertension in Bangladesh could be attributed to an aging population, urbanization, and lifestyle changes.

Economic Development: Economic development typically refers to the growth and improvement in the economic well-being of a country or region (Saunders, C. & Dalziel, P. 2004). In the case of Bangladesh, economic development has been evident over the years, with improvements in various indicators such as GDP per capita, poverty reduction, and infrastructure development.

Economic Indicators in Bangladesh

Gross Domestic Product (GDP): Bangladesh has experienced robust economic growth in recent years, with a GDP growth rate averaging around 7% annually (Islam, M.R. *et al.* 2018). The GDP of a country can impact the standard of living, access to healthcare, and overall well-being of its citizens.

Income Inequality: Income inequality is a significant concern in Bangladesh, as there is a noticeable wealth gap between different segments of the population. Higher income inequality can contribute to disparities in access to healthcare and nutrition, potentially affecting public health (Kawachi, I. & Kennedy, B.P. 1999).

Healthcare Expenditure: The level of healthcare expenditure as a percentage of GDP is an important economic indicator. In Bangladesh, the healthcare sector has been growing, but access to quality healthcare remains a challenge, particularly in rural areas (Franco, C.M. *et al.* 2021).

Poverty Rate: Despite economic growth, a substantial portion of the population in Bangladesh still lives below the poverty line (Hossain, M., 2004). Poverty can be linked to higher stress levels and reduced access to proper healthcare, which may contribute to hypertension.

Unemployment Rate: The unemployment rate can impact people's stress levels and access to healthcare. High unemployment rates may lead to increased stress, which is a risk factor for hypertension (Mæhlisen, M.H. *et al.* 2018).

The prevalence of hypertension is associated with economic development

The relationship between development of economic indicators and hypertension is complex and multifaceted. It involves a combination of

factors, including individual behavior, healthcare infrastructure, and government policies. Public health initiatives, education, and awareness campaigns can play a crucial role in addressing hypertension and related health issues in Bangladesh. For the most current and in-depth analysis of this relationship, it is advisable to consult recent studies and reports from relevant health organizations and government agencies. Hypertension, or high blood pressure, is a medical condition that can be influenced by both economic and lifestyle factors. Here are some ways in which development of economic indicators may relate to the prevalence of hypertension in Bangladesh:

Access to Healthcare: Access to quality healthcare is critical for diagnosing and managing hypertension. Economic factors, such as healthcare expenditure and income inequality, can impact people's access to healthcare services and medications for hypertension (Rahmawati, R. & Bajorek, B.V. 2018).

Nutrition: Economic factors can affect the availability and affordability of nutritious foods. A diet high in salt, processed foods, and low in fruits and vegetables can contribute to hypertension. Economic disparities may limit access to healthier food choices for some individuals (Azadbakht, L. *et al.* 2005).

Stress and Lifestyle: Economic instability and poverty can contribute to higher stress levels. Chronic stress is a risk factor for hypertension. Additionally, economic difficulties may limit opportunities for physical activity and lead to unhealthy lifestyle choices (James, S.A. & Kleinbaum, D.G. 1976).

Education: Education is often linked to income and access to information about health. A higher level of education can lead to better health awareness and practices, which may reduce the risk of hypertension (World Health Organization, 2002).

Healthcare Expenditure: The burden of hypertension on the healthcare system is substantial. Patients with hypertension often require lifelong medical attention, including medication, regular check-ups, and treatment of complications such as heart disease, stroke, and kidney problems. These healthcare costs strain both the government and individuals (Shami, L. & Lazebnik, T. 2022).

Lost Productivity: Hypertension can lead to reduced work productivity and absenteeism due to its debilitating effects on individuals. This results in economic losses as the workforce becomes less efficient, and employers must cope with higher healthcare expenses (Carregaro, R.L. *et al.* 2020).

Premature Mortality: Uncontrolled hypertension can lead to premature mortality, robbing the nation of its productive citizens. Premature deaths reduce the workforce and the country's overall human capital (Cushman, W.C. 2003).

Impact on Family Income: Households with hypertensive members often experience increased financial stress due to high medical bills and the need for medications. This, in turn, can lead to decreased investment in education and other essential services (Lu, Y., 2012).

Government Spending: The government must allocate a substantial portion of its budget to combat the rising healthcare costs associated with hypertension. This diverts resources that could be used for other development projects and social programs (Dieleman, J.L. *et al.* 2020).

Socioeconomic Status: Economic development often leads to improved living standards and income levels, which can reduce the risk of hypertension. People in higher socio-economic classes may have better access to healthcare, healthier diets, and less stressful living conditions, all of which can mitigate hypertension risk (Ohlson, M. 2020).

Lifestyle Changes: Economic development can be associated with urbanization and changes in lifestyle. Urbanization often brings about a more sedentary lifestyle, increased stress, and changes in dietary patterns, which can contribute to the development of hypertension (Sherif, S. & Sumpio, B.E. 2015).

Diet: As countries develop economically, their diets often shift towards a higher consumption of processed foods, high in salt, sugar, and unhealthy fats. This dietary transition can lead to obesity, diabetes, and hypertension (Nestle, M. 2000).

Healthcare Access: In economically developed countries, healthcare systems tend to be more advanced, offering better access to medical services, early detection, and management of hypertension. However, access to healthcare can still be uneven, leading to disparities in hypertension outcomes (Biel, M., Grondys, K. & Androniceanu, A.M. 2022).

Environmental Factors: Economic development can result in increased environmental pollution and exposure to toxins, which can negatively impact cardiovascular health and increase the risk of hypertension (Maria Bruno, R. 2017).

Stress: Economic development can create a more competitive and stressful work environment, which can be a risk factor for hypertension. High-stress jobs, long working hours, and inadequate work-life balance can contribute to hypertension (Liu, M.Y. 2017).

Urbanization: Economic development is often associated with increased urbanization, leading to changes in transportation, increased air pollution, and changes in the built environment. These factors can contribute to hypertension (Niakara, A. *et al.* 2007).

Access to Medication: In economically developed countries, there is typically better access to antihypertensive medications, making it easier for individuals to manage their blood pressure. However, affordability and adherence to medication regimens can still be issues (Brown, M.T. *et al.* 2016).

Economic development is one of the factors that influence the complex medical disease known as hypertension, or high blood pressure. Over the past few decades, there has been a notable increase in the prevalence of hypertension. Numerous reasons, such as urbanization, sedentary lifestyles, poor diets, and genetic predispositions, are blamed for this increase. The World Health Organization (WHO) estimates that 20% of Bangladesh's adult population has hypertension (Akter, T. *et al.* 2021). Thus, the high incidence of hypertension creates obstacles to economic growth.

Preventive Measures

Preventing and controlling hypertension in Bangladesh is not only a matter of public health but also of economic importance. Several strategies can be employed to mitigate the prevalence of hypertension and its economic impact:

Health Education: Public health campaigns can raise awareness about hypertension, its risk factors, and the importance of lifestyle changes such as regular exercise, a balanced diet, and reduced salt intake.

Access to Healthcare: Improving access to healthcare services, especially in rural areas, can help diagnose and manage hypertension at an earlier stage, reducing complications and costs.

Affordable Medications: Ensuring the availability of affordable hypertension medications is essential for individuals and the government to manage healthcare expenses.

Workplace Wellness Programs: Employers can play a role by implementing workplace wellness programs that promote healthy lifestyles, reducing the risk of hypertension among employees.

Government Initiatives: The government can implement policies and regulations to promote healthy eating, limit the use of salt in processed foods, and encourage physical activity through urban planning and public spaces.

SUGGESTIONS

To address the burden of hypertension in Bangladesh in the context of economic development, it is essential for policymakers and healthcare professionals to:

- Promote healthy lifestyles through public health campaigns to reduce risk factors like poor diet, lack of exercise, and smoking.
- Ensure equal access to healthcare services to diagnose and manage hypertension.
- Monitor and address stress-related issues in urban areas.
- Implement policies and regulations to promote healthier diets and reduce salt intake.
- Provide healthcare infrastructure and services that cater to the aging population.

CONCLUSION

Millions of individuals worldwide suffer from high blood pressure, a common and persistent medical disease. Not only is hypertension a public health issue, but it also plays a significant role in Bangladesh's economic growth. The rate of increase in the prevalence of hypertension in recent years cannot be underestimated, as risk factors for hypertension may be influenced by economic development. Bangladesh can enhance the health and well-being of its people and eventually foster economic growth and development by

tackling hypertension. In the context of economic development, effective public health interventions and policies are crucial to lowering the risk of hypertension and the difficulties that come with it. Furthermore, current facts and research on the topic are essential.

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