



Diabetes Prevalence and its Association with Diet and Lifestyle Among Adults in Cox's Bazar, Bangladesh

Md Abeed Hasan^{1*}, U Swai Ching Marma¹, Aye Noyai Prue¹, and Charls Erik Halder²

¹Department of Public Health and Life Science, North South University, Bangladesh

²Humanitarian and Conflict Response Institute (HCRI) - University of Manchester, UK

*Corresponding Author: Charls Erik Halder, Humanitarian and Conflict Response Institute (HCRI) - University of Manchester, UK.

DOI: 10.31080/ASMS.2022.06.1355

Received: June 27, 2022

Published: August 04, 2022

© All rights are reserved by Md Abeed Hasan., et al.

Abstract

Diabetes is one of the most critical issues relating to public health that developing nations are now experiencing. The people of Bangladesh have a limited understanding of the elements that contribute to diabetes risk. Diabetes mellitus is a public health problem in both industrialized and developing nations, and its occurrence has significantly grown, giving the illness the characteristics of an epidemic. Diabetes is characterized by a high blood sugar level that results in a buildup of glucose in the blood. Diabetes is caused by a complex interplay of factors, including genetics, environment, and behavior. Exercise is very necessary for the successful control of diabetes mellitus. Insulin resistance can be lowered, glucose tolerance can be increased, lipid profiles may be improved, and both cardiopulmonary and cardiovascular performance can be enhanced with regular exercise. This article presents the most compelling evidence about the connections between one's lifestyle, diet, and the development of type 2 diabetes. The prevention of diabetes via the management of its risk factors is now one of the most pressing issues in public health, and its solution should be investigated by both medical professionals and policymakers for early intervention.

The findings of the research were deduced from the responses of one hundred and ten adults aged 18 and older who took part in the inquiry. The respondent's blood pressure was determined by taking an average of the results of the second and third measurements, which were taken at around 10-minute intervals between each of the three tests. In all, the respondent had three readings taken. The respondent's blood pressure was determined by taking the average of the results from the second and third readings taken of their blood pressure. A patient was considered to have diabetes if their blood glucose level was more than or equivalent to 11.1 mmol/L, or if they self-reported using diabetic medication. If you have hypertension, which is defined as a systolic blood pressure that is more than 140 mmHg or a diastolic blood pressure that is greater than 90 mmHg, or if you are currently receiving treatment with antihypertensive medication, then you have hypertension.

Our study reveals that 56% of diabetics were unaware of their condition, and just 40% took their medication as prescribed by their doctor. According to the results of a recent research done and released by the International Diabetes Federation, more than 50% of diabetics in South Asia are ignorant of their condition. Diabetes is wreaking havoc on young people in developing nations, causing disability, economic loss, and premature death.

Diabetes affects more than 10% of adults in the United States at this point, and the number of people being diagnosed with the disease is fast increasing at an alarming rate. A significant fraction of diabetic patients are unaware that they have the condition, and the vast majority of diabetics do not get treatment on a continual basis.

Keywords: Type 2 Diabetes; Risk Factors; Physical Activity; Diabetes Mellitus; Bangladesh

Introduction

Because of the widespread prevalence, diabetes mellitus is the leading cause of death and disability around the world. Around 8% of people were affected by it all over the world in 2011, and experts predict that number will rise to 10% by the year 2030 [1,2]. About 80% of the world's diabetic population lives in nations with incomes that fall somewhere in the middle range [3].

The following nations and regions in Asia and the eastern Pacific are most impacted by this issue: 3–8 China had the highest number of adults living with diabetes in 2011 with 90 million, which is equivalent to 9% of the population, followed by India with 61.3 million adults living with diabetes, which is equivalent to 8% of the population, and Bangladesh with 62 million adults living with diabetes (8.4 million, or 10% of the population).

However, many governments and those responsible for planning public health remain generally unaware of the existing incidence of diabetes and prediabetes, as well as the possibility of a future increase in prevalence and the catastrophic complications associated with the disease [3]. Those who are responsible for planning public health also remain generally unaware of the possibility of a future increase in prevalence and the catastrophic complications associated with the disease. As a consequence of this, having knowledge about the prevalence of diabetes and prediabetes as well as the risk factors associated with both conditions could lead to an increase in awareness of the disease and could also result in the development of new policies and strategies for the management and prevention of the condition. A recent meta-analysis found that the prevalence of diabetes among adults in Bangladesh, which had a population of 149.8 million in 2011, increased rapidly from 4% in the years 1995 to 2000 and 5 percent in the years 2001 to 2005 to 9 percent in the years 2006 to 2010 [9]. Bangladesh's population peaked in 2011 at 149.8 million people. There will be 13% of the population suffering from diabetes by the year 2030, as predicted by the International Diabetes Federation [5].

The prevalence of diabetes mellitus and associated risk factors have not been investigated in a nationally representative epidemiological investigation. As part of this study, exploratory research was undertaken on the prevalence of diabetes mellitus and its association with diet and lifestyle among the adult population of the outpatient departments at Cox's Bazaar Sadar Hospital [3].

General objective

To determine the prevalence of diabetes mellitus and its association to their diet and lifestyle among the adult population in Cox's Bazar.

Specific objective

- The primary objective of this study is to ascertain the extent of the burden posed by diabetes mellitus among the adult population, which will serve as a proxy for the situation facing the country as a whole.
- To determine the association between diabetes mellitus and dietary habits and lifestyles, and then to convey this information to the participants and the population at large so that they can adjust their dietary habits and lifestyles in accordance with the findings.
- To exert influence on the government and policymakers and ensure that they comprehend the scope of the issue in order for them to take the appropriate actions required to bring the situation under control.
- Raise public awareness in order to cut down on deaths and disabilities brought on by diabetes and other non-communicable diseases in general, as well as those brought on by diabetes complications.

Justification

The worldwide prevalence of diabetes mellitus makes it the main cause of death and disability. The incidence of diabetes mellitus is becoming steadily higher day by day [1,2]. This noncommunicable disease and its complications not only take lives, but also cause disability and impose a financial burden on those who are afflicted with them. This is a disease of one's way of life. Therefore, it is necessary for us to have a general understanding of the state of this disease and to investigate the types of foods and behaviors that are associated with the development of diabetes. If we are able to determine the lifestyle factors that are linked to diabetes, then we will be able to implement particular therapies that will lessen the impact of this condition. In the end, we will be able to reduce the number of deaths and all of the difficulties caused by diabetes, a condition that has multiple effects, including those on the body, the mind, society, and finances.

Methodology

The participants in this study were patients who sought consultation at one of the numerous outpatient departments that are housed within the Cox’s Bazar Sadar Hospital. The findings of the study were based on the responses of 110 persons over the age of 18 who took part in the research. The administration of North South University as well as the administration of Cox’s Bazar Sadar Hospital have both given their approval for the research project to get forward.

To gather in-depth information on the sociodemographic features of all of the participants, a standard questionnaire was employed. This questionnaire included questions about the diagnosis and treatment of diabetes in its pool of potential responses. In order to evaluate factors such as blood pressure, blood glucose concentration, body weight, and height, standard procedures were applied.

In order to obtain accurate readings of the patient’s blood pressure, an ALP-K2 sphygmomanometer was utilized (Tokyo, Japan). The respondent’s blood pressure was determined by taking the average of the results of the second and third readings, which were taken at approximately 10-minute intervals between each of the three tests. The respondent’s blood pressure was determined by taking the average of the results of the second and third readings. A finger prick was used to collect whole blood from

random capillaries situated in either the middle or ring finger, and then a HemoCue Meter was utilized to determine the amount of glucose that was present in the blood. The levels of glucose that are measured in the blood have been adjusted such that they are comparable to the amounts of glucose that are measured in the plasma [9]. Diabetes was defined as a level that was greater than or equal to 11.1 mmol/L or the use of diabetes medication that was self-reported by the patient. The presence of hypertension, which was defined as a systolic blood pressure that was greater than 140 mmHg or diastolic blood pressure that was greater than 90 mmHg or current treatment with antihypertensive medication; rural or urban residence; the respondent’s age, sex, marital status, educational level, working status and body mass index.

Statistical analysis

The principles outlined in Strengthening the Reporting of Observational Studies in Epidemiology, or STROBE followed throughout the process of planning and writing up the study [10]. The t-test or the χ^2 test, depending on whether the variable in question was continuous or categorical, was utilized to analyze the differences in the variables between people who had diabetes and those who did not have the condition. Estimates were made for both the whole study population and for each population subgroup with regard to the prevalence of diabetes.

Results

Traits		(95% Confidence Interval)	
		Unadjusted individual	Age-adjusted individual
Gender	Male	9.4 (8.3-10.5)	9.3 (8.2-10.4)
	Female	10.3 (9.2-11.4)	10.4 (9.3-11.5)
Education level	No education	7.4 (6.3-8.4)	7.0 (6.1-8.0)
	Primary education	9.9 (8.4-11.3)	10.1 (8.6-11.6)
	Secondary education	12.1 (10.1-14.1)	12.8 (10.7-15.0)
	Higher education	20.6 (17.3-23.9)	21.9 (18.4-25.5)
Currently working	Yes	11.1 (9.9-12.3)	10.9 (9.8-12.1)
	No	8.5 (7.5-9.6)	8.7 (7.6-9.7)
Marital status	Currently married	9.6 (8.7-10.5)	9.7 (8.8-10.6)
	Divorced, widowed or other	11.4 (9.2-13.5)	10.7 (8.6-12.7)
Hypertension	Yes	8.0 (7.1-8.8)	8.0 (7.2-8.9)
	No	15.4 (13.4-17.5)	15.1 (13.1-17.0)

Body weight	Normal	8.8 (8.0-9.6)	8.8 (8.0-9.7)
	Overweight or obese	23.5 (19.1-27.8)	22.8 (18.7-27.0)
Socio-economic status	Poorest	6.4 (4.8-8.0)	6.4 (4.8-8.0)
	Poorer	6.3 (4.7-7.9)	6.3 (4.7-7.8)
	Middle	6.3 (5.0-7.6)	6.3 (5.0-7.6)
	Richer	10.4 (8.5-12.2)	10.4 (8.6-12.2)
	Richest	19.2 (16.9-21.5)	19.3 (17.0-21.6)
Place of residence	Urban	15.0 (13.0-16.9)	15.2 (13.2-17.2)
	Rural	8.3 (7.4-9.2)	8.3 (7.4-9.2)
Overall prevalence		9.9 (9.0-10.7)	9.7 (4.2-10.5)

Table 1: Individual prevalence of diabetes

People who had diabetes often lived far longer than those who did not have the condition, and they had a considerably lower risk of not having any formal education or having hypertension than those who did not have diabetes. On the other hand, persons who had diabetes had a significantly increased likelihood of being employed or of being overweight or obese. In addition to this, it was found that those who had diabetes were more likely to come from families that held a high socioeconomic status. Only 12.7% of people with diabetes came from the lowest quantile of income, but 41.7% of diabetics came from the highest quintile of income.

The prevalence of diabetes did not differ significantly between the sexes according to statistical analysis, and the overall age-adjusted rate of diabetes was 9.7%. On the other hand, the prevalence of diabetes was nearly twice as high among urban people when compared to the prevalence of diabetes among rural residents when age was taken into account: 15.2% versus 8.3 percent, respectively. Only 39.5% of diabetics were actively participating in treatment on a regular basis, and 56.0% of diabetics were unaware that they even had the condition. There was a connection between being older and having a greater risk of developing diabetes. This was supported by the findings of the study.

The risk was much greater for those aged 45 to 49 years and 55 years or older than for those aged 35 to 39 years; for example, the risk was about twice as high for those aged 55 to 59 years compared to those aged 35 to 39 years. In addition, having a high level of education, hypertension, being overweight or obese and originating from a wealthy family were all highly connected with an increased chance of acquiring diabetes.

Discussion

We evaluated the prevalence of diabetes and analyzed the influence of risk factors for diseases that are associated with the characteristics of persons. The results of the study indicated that ten percent of the persons who took part in the research suffered from diabetes. The prevalence of diabetes among Bangladesh's adult population seems to have reached epidemic proportions as a result of this. In addition, we found that the prevalence of diabetes varied significantly depending on the age, educational level, and body weight of the individual, as well as the presence or absence of hypertension, the socioeconomic position of the household, and the location in which they lived. This was something that we discovered. The results of this research are consistent with the findings of a recent systematic review, which discovered that the incidence of diabetes in Bangladesh is on the increase [5]. The findings of this study are consistent with the findings of the previous systematic review.

Our findings on the connections between diabetes and age as well as total body mass are consistent with those that have been found in other regions of the globe. However, the connections that can be drawn between a person's degree of education and the socioeconomic standing of their family might vary significantly from one nation to the next. The favorable linkages that we found between these two variables and diabetes have also been noticed in the past in Bangladesh [11]. These connections were established by us.

According to the findings of our research, 56% of diabetics were ignorant that they had the disease, and only 40% took their medicine

in the manner that was prescribed by the doctor. A comparable report was only recently published by the International Diabetes Federation, which claimed that more than half of diabetics living in South Asia were unaware that they had the ailment. Diabetes is wreaking havoc on young people in developing countries, leading to impairment, loss of income, and mortality at an earlier age [3]. As a result of the fact that people of working age are more vulnerable to the effects of the illness, the economic potential of these countries may be reduced. A recent study conducted in Bangladesh found that in order for families to finance diabetes treatment, around 12 percent of them resort to taking out loans or selling assets to make up the difference. As a consequence of this, diabetes is not only to blame for major health problems but is also blamed for placing a financial strain on families [12].

In spite of the fact that diabetes and other chronic diseases pose significant threats to the health of the general population in

Bangladesh, the healthcare system in that nation does not place a high priority on addressing these issues. In particular, good outcomes for people with diabetes in Bangladesh are difficult to achieve because of the following factors: the inaccessibility of health insurance, with the exception of a few regions of the country where it is provided by programs run by non-governmental organizations; (ii) inadequately trained staff and limited health-care facilities in rural areas; (iii) rapid lifestyle changes brought on by urbanization; and (iv) the absence of health awareness programs. Establishing universal health coverage has shown to be the most effective strategy for ensuring both the accessibility of medical care and its capacity to be paid for by a wide range of people. Because it appears that an epidemiological shift is taking place in Bangladesh, it is essential that any risk pooling mechanism that is introduced into the country on the path toward universal health coverage include financing for public health initiatives that aim to prevent and control diabetes [13,14].

Characteristics		Odds ratio (95% CI)	p-value
Age group (years)	35-39	1.00	*
	40-44	1.17 (0.87-1.57)	0.30
	45-49	1.46 (1.09-1.96)	0.01
	50-54	1.33 (0.97-1.82)	0.08
	55-59	1.94 (1.40-2.68)	<0.01
	60-69	1.51 (1.09-2.08)	0.01
	70 or more	1.82 (1.27-2.60)	<0.01
Sex	Male	1.00	*
	Female	0.96 (0.73-1.25)	0.75
Educational level	No education	1.00	*
	Primary education	1.36 (1.09-1.69)	0.01
	Secondary education	1.52 (1.18-1.96)	<0.01
Currently working	Yes	0.72 (0.55-0.94)	0.01
	No	1.00	*
Marital status	Married	1.00	*
	Divorced	1.06 (0.82-1.36)	0.67
Hypertension	Yes	1.57 (1.31-1.88)	<0.01
	No	1.00	*
Body weight	Normal	1.00	*
	Overweight or obese	1.93 (1.52-2.47)	<0.01

Socio-economic status	Poorest	1.00	*
	Poorer	0.79 (0.57-1.10)	0.17
	Middle	0.80 (0.58-1.10)	0.17
	Richer	1.12 (0.82-1.52)	<0.01
	Richest	2.15 (1.55-2.98)	<0.01
Place of residence	Urban	1.00	*
	Rural	0.94 (0.77-1.15)	0.57

Table 2: Diabetes-related risk issues and variables to consider (Logistic regression model).

Conclusion

The number of people who are diagnosed with diabetes continues to climb steadily and now accounts for over 10% of the adult population. According to our data, people who are 35 years old or older have an extremely high prevalence of diabetes. People who were older, wealthier, more obese and had a higher level of education had a greater risk of developing diabetes. A sizeable fraction of people who have diabetes are unaware that they have the condition and the vast majority of diabetics are not receiving treatment on a consistent basis.

Recommendation

In an effort to combat diabetes, Bangladesh may choose to use the following strategies: Information on diabetes prevention and control could be included in government-sponsored health promotion programs; adults could be encouraged to participate in screening programs on an annual basis; prediabetes could receive more attention, and individuals could be encouraged to take part in weight management programs.

Bibliography

- Lozano R., *et al.* "Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010". *Lancet* 380 (2012): 2095-2128.
- Murray CJ., *et al.* "Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010". *Lancet* 380 (2012): 2197-223.
- International Diabetes Federation (IDF). Country estimates table 2011. IDF diabetes atlas. 6th ed. (2012).
- Rahim MA., *et al.* "Rising prevalence of type 2 diabetes in rural Bangladesh: a population based study". *Diabetes Research and Clinical Practice* 77 (2007): 300-305.
- Saqib N., *et al.* "Cardiovascular diseases and type 2 diabetes in Bangladesh: a systematic review and meta-analysis of studies between 1995 and 2010". *BMC Public Health* 12 (2012): 434.
- Shera AS., *et al.* "Pakistan National Diabetes Survey: prevalence of glucose intolerance and associated factors in Baluchistan province". *Diabetes Research and Clinical Practice* 44 (1999): 49-58.
- Yang W., *et al.* "China National Diabetes and Metabolic Disorders Study Group. Prevalence of diabetes among men and women in China". *The New England Journal of Medicine* 362 (2010): 1090-101.
- Zhang H., *et al.* "Relation of socio-economic status to impaired fasting glucose and type 2 diabetes: findings based on a large population-based cross-sectional study in Tianjin, China". *Diabetic Medicine* 30 (2013): e157-162.
- D'Orazio P., *et al.* "International Federation of Clinical Chemistry Scientific Division Working Group on Selective Electrodes and Point of Care Testing. Approved IFCC recommendation on reporting results for blood glucose (abbreviated)". *Clinical Chemistry* 51 (2005): 1573-1576.
- von Elm E., *et al.* "Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies". *Bulletin of the World Health Organization* 85 (2007): 867-872.
- abu Sayeed M., *et al.* "Effect of socioeconomic risk factors on the difference in prevalence of diabetes between rural and urban populations in Bangladesh". *Diabetes Care* 20 (1997): 551-555.

12. Rahman MM., *et al.* "Self-reported illness and household strategies for coping with health-care payments in Bangladesh". *Bulletin of the World Health Organization* 91 (2013): 449-458.
13. Savedoff WD., *et al.* "Political and economic aspects of the transition to universal health coverage". *Lancet* 380 (2012): 924-932.
14. Moreno-Serra R and Smith PC. "Does progress towards universal health coverage improve population health?" *Lancet* 380 (2012): 917-923.