Original Article

Wealth Differentials in Prevalence of Self-Reported Diabetes Mellitus in Bangladeshi Adults

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Key words:
Diabetes, Wealth indices, Education, Bangladesh.

Abstract:

Background: We report relationship of wealth indices with self-reported diabetes data in Bangladeshi people. As a secondary objective we examine whether educational achievement can be used as a proxy of wealth indices.

Methods: We have analyzed data of a nationally representative STEPS survey (STEPwise Surveillance of NCD risk factors) done in 2010 in 8808 adults selected at their households using a multistage cluster sampling approach to describe association of socioeconomic status with diabetes mellitus. We created wealth indices using principal component analysis based on a 20-item household asset items; and then divided subjects in to quartiles.

Results: Prevalence of documented diabetes was 3.9% but it was more than 11 times (9.3%) in the fourth quartile (richest) compared to the first quartile (0.8%). This may either mean that the detection rate is higher among the higher socioeconomic group or there are some intervening factors accompanied by the economic achievements that favors occurrence or detection of diabetes in Bangladeshi adults.

Conclusion: Future studies need to identify the factor(s) that provides such a putative effect. Educational achievement also has shown similar trend. Therefore, education might be a proxy variable to determine socioeconomic status instead of a long list of household asset items.

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Introduction:

There are lines of evidences that the prevalence of diabetes mellitus is rising in Bangladesh[1] as is happening in the South-East Asia Region[2] and elsewhere[3]. Diabetes is a major cause of death, disability and shorter lifespan.[4] Therefore its control has been considered for noncommunicable diseases (NCD) monitoring framework of the World Health Organization[5] and Sustainable Development Goals[6]. The occurrence of diabetes reported to have a socioeconomic differential. There are studies that diabetes happens more in

poor[7] while others report that it as a disease of the rich[8]. In this paper we report relationship of wealth indices with self-reported diabetes data in Bangladeshi people. As a secondary objective we examine whether educational achievement can be used as a proxy of wealth indices.

Methods:

This analysis is based on a nationally representative STEPS survey 2010 done by

Bangladesh Society of Medicine using a multi-stage cluster design. It was a household-based survey for those aged 25 years or older (n=9 275). However, in the current analysis we include those aged 25 to 69 years (n= 8 808) for comparability with other studies elsewhere as per STEPS protocol.[9] Details of methods including ethical clearance have been reported elsewhere.[10] Briefly, data on education and 20-item household assets were collected to define socioeconomic status. We did not measure blood glucose, and therefore defined diabetes by current medication history (insulin or oral hypoglycemic agents). In doubtful cases enumerators inquired about the names of medicines and checked the prescriptions or strips (or injection vials) of medicines if necessary.

We have done a complex survey design analysis of data, using *Epi Info* statistical package version 7.2.2, to obtain prevalence (with 95% confidence intervals) of diabetes in age and sex groups. Wealth indices were created using principle component analysis of household asset items,[11] and subjects were categorized in to quartiles. Finally, prevalence estimates and their 95% confidence intervals were plotted in column charts according to wealth quartiles in men and women.

Results:
Self-reported prevalence of diabetes was 3.9% (95% confidence interval, 3.4% – 4.5%). Prevalence estimates were not statistically different between men and women (4.2% vs 3.6%). Diabetes prevalence increased with age consistently (data not shown). Prevalence was almost three times higher in urban areas (5.8%) compared to rural areas (2.0%) which was statistically significant. The urban people were more overweight and less active compared to rural people (data not shown).

There has been a clear gradient (in increasing order) of diabetes across the wealth quartiles (Figure 1, panel a). Prevalence in fourth quartile was more than 11 times (9.3%) than first quartile (0.8%). We observed similar but a little subtle trend for educational achievements (Figure 1, panel b).
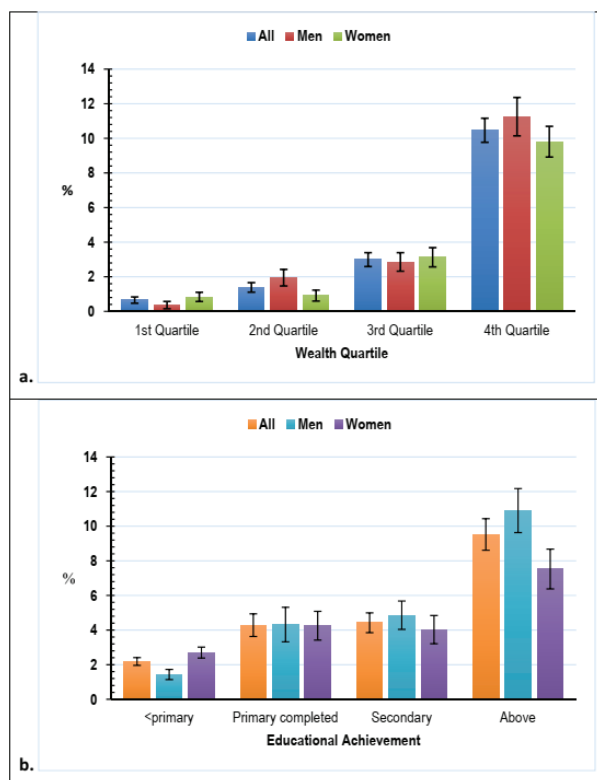

Fig.-1: *Prevalence of self-reported diabetes according to wealth quartiles (a) and educational achievements (b) in men and women*

Discussion:
This is the first study done in adults aged 25 years or older to report socioeconomic gradients of diabetes mellitus, although we used a case definition that limits the scope of discussion. Our case definition (medication for diabetes) might have excluded some people those who were diagnosed but were not taking medicines. Use of blood glucose data could yield a higher prevalence of diabetes.[12] The only national study using blood glucose was done for those aged 35 years and above, although the details of selection for ages beyond 45 years are not available.[8] Therefore, a survey of national scale using blood glucose measurement for ages 18 years and older in line with Sustainable Development Goals is warranted. The use of household assets to determine socioeconomic status is a common practice where income cannot be easily determined. One advantage of using assets is their visibility in addition to an indication how money earned is spent to improve livelihood. However, collecting data on dozens of items is cumbersome.

Respondent reaction to such asset inquiry is frequently unwelcoming. We need to explore some other variable that would be time efficient to avoid fatigue from either side. One such variable, for Bangladeshi people, could be educational achievement. We have seen similar gradients of diabetes across educational categories. Our data on hypertension also have shown similar trend (not shown). Therefore, we suggest that educational achievement, at least for a medium term, could be used as a proxy of socioeconomic status ascertained out of a long list households asset items.

We acknowledge that our definition of diabetes might have favored inclusion of relatively rich people as numerator of current analysis. Keeping this in mind, we report here that economic achievement is linked to diabetes. Whereas in some developed countries it is the poor who suffer most.[13] We need to find out which factor(s) is responsible for this opposite trend and spoiling the fruit of economic emancipation in our society.

Our data supports that a higher rate of diabetes in urban area is linked to overweight and insufficient physical activity.[10] This might be due to some obesogenic diet and some other stressors for which we do not have data at hand.[14] Urban people are generally more aware about health issues because of higher rates of education and media coverage. Therefore, increasing awareness in general is not the answer to this paradox. Specific points have to be identified for intervention at least to 'halt rise in diabetes'.[5]

Conclusion:

We would like to say that economic emancipation is warranted but factors intervening between this achievement and occurrence of diabetes must be explored before it is too late. Development initiatives and urban planning employed in Bangladesh needs a revisit to control diabetes. Similar finding of wealth indices and educational achievement to reflect socioeconomic status provides an indication that educational achievement can be used as a proxy variable at least for a medium term.

Declarations:

Competing interests: The authors declare that they have no competing interest. The views expressed

Conflict of Interest - None.

Acknowledgement:

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