Assessment of Lifestyle and Its Relation with Diabetes Mellitus in A Selected Under Privileged Community in Dhaka City, Bangladesh

Farhana Faruque Zerin[1], Nasrin Akter[1], A.K.M Shafiul Kadir[2], Nishad Shahidullah[3], Jahidul Bari[4]

[1]Research Fellow, Global Health Research Center (GHRC), Department of Public Health, Northern University Bangladesh (NUB), [2]Lecturer, Department of Public Health, Northern University Bangladesh (NUB), Phone: +8801675746599, [3] M.Phil. Fellow (IBSc, RU), [4]Assistant Professor, Department of Pediatric Dentistry, City Dental College and Hospital,[5]Resident surgeon, Hebei Medical University, China

Abstract

Background: The effects of modernization of lifestyle have led to a dramatic increase in the prevalence of diabetes globally with very high rates in developing nations, particularly in Asia and the Pacific. The study was designed to show the link between lifestyle factors and having Diabetes Mellitus.

Methodology : A cross-sectional study conducted on a sample of 205 slum dwellers in Dhaka city, Bangladesh to assess lifestyle and its relation with diabetes mellitus. Respondents were interviewed by the pretested questionnaire. Proportion was presented by frequency and cross tabulation analysis. Associotion were analyzed by using Pearson's chi-square ($\chi 2$) test.

Result: A statistically significant association is found between family history and having DM (p=0.12), where it is seen family history is a prominent risk factor of DM. Age group (p=0.00) and monthly family income (p=0.00) has a greater influence on having diabetes mellitus. Furthermore, respondents aged 39 - 50 years had a higher prevalence of diabetes. It was also seen that the prevalence of diabetes was significantly much higher among subjects of high-income families, while Physical activity (p=.002) and timely taking meal (p=0.00) greatly affect the diabetic curve. Moreover, smokers and alcohol consumers were more likely to develop diabetes mellitus in the community.

Conclusion: This study suggests that improving quality of life, dietary habit, health awareness through public health promotional education, mass media campaigns and treatment strategies are urgently needed to prevent the growing burden associated with diabetes.

Keywords:*Diabetes Mellitus, Under Privileged Community, Lifestyle Factors*

Introduction

Prevalence of Diabetes dramatically increases globally because of modernization of lifestyle and aging of populations. Incidence rate is high in the developing nations, more specifically in Asia and Pacific.[1] According to the international Diabetes Federation (2019), worldwide approximately 463 million adults (20-79 years) were living with Diabetes and by the year 2045, it will rise to 700 million. It is estimated that 79% of adults with diabetes living in low and middle-income countries. Diabetes caused 4.2 million deaths in 2019 and estimated health expenditure was USD 760 billion.[2] The highest prevalence and susceptibility of type 2 diabetes has been well documented in Micronesian and Polynesian Pacific Islanders,[3] Native Americans,[4] Indigenous Australians and Torres Strait Islanders,[5] and Asian Indians.[6] In the context of present world, the prevalence of diabetes is dramatically increased & the dynamics of diabetes epidemic have changed rapidly.[7] Many countries have limited infrastructure for diabetes care and poor equipment for managing diabetic patients.[8] Genetic predisposition and behavioral and environmental influence are considered

as important risk factor in development of Diabetes Mellitus.[9] Although genetic variant are not still poorly understood but obesity, physical activity and sedentary lifestyle are modifiable risk factors.[10-17] According to Finnish Diabetes prevention study life style changes includes body weight control, physical activity and dietary modification intervention program lasting for 3-6 years result in 58% reduction of diabetes risk.[18-20] No study has been conducted so far to show the link between lifestyle factors and Diabetes Mellitus among the under privileged community people in Dhaka City, Bangladesh. Findings from these studies will guide the policy maker to emphasize the need for substantial improvements of diabetes detection and treatments are needed in Bangladesh especially among disadvantaged populations. Improving detection, awareness, and treatment strategies is urgently needed to prevent the growing burden associated with diabetes and it will possible to draw some tentative conclusions as to the causes of Diabetes Mellitus prevalence worldwide.

Methods and Materials

Study Description: A cross-sectional study was conducted among the slum dwellers at Mirpur area in Dhaka City Bangladesh to assess the life style related variables and its correlation with having Diabetes Mellitus. Significant portions of the city's population living in slums and provision of health services to these people faces many challenges due to their livelihood. Therefore, we select slum dwellers as our study population. We exclude those who had a major psychiatric problem and only adults (27-62) were included in this study.

Sampling technique: We enrolled 250 respondents, 30 were excluded during run-in-phase due to inadequate adherence. Of 220 participants, 15 withdraw due to lack of time or loss of interest. Finally, 205 respondents selected from 200 households, participated in this study. Participant for this quantitative study were the slum dwellers in Mirpur area, Dhaka. Sample size was calculated using the formula $n= z^2pq/d^2$. Nonrandomized Purposive sampling technique was applied to conduct the study.

Data Collection technique & instrument: Data were collected from the respondents through face-to-face interview method. A pre-tested, semi-structured, and self administered questionnaire was prepared for the data collection based on socio-demographic, lifestyle, medical and other health related status of the study subjects. Questionnaire that were included in the socio-demographic and lifestyle related factors were body mass index (BMI), physical activity, having timely meal, income, education, smoking status, alcohol intake, depression, family history, visiting to physician etc. The low income, medium income and high-income households such as US$ 177.5, US$178 to 812 and US$ 812, categorized monthly income.[21] Knowledge regarding of the study respondents was also included in the questionnaire.

Measures: A scoring system was used to measure the knowledge variables of the slum dwellers. Each correct answer was given a score of one mark and zero for wrong or no answer. For multiple answers, score 1 was divided by total number of answer given by the respondents. Then the total obtained marks were converted into percentage. ≤50% knowledge score considered as inadequate knowledge and >50 to 100% as adequate knowledge to analyze the knowledge level of the respondents.[22]

Data Analysis: Data were cleaned, edited, verified and coded to exclude any error or inconsistency. Analysis was done using statistical package social science software (SPSS) software version 21. All results p value < 0.05 was considered as statistically strong significant. Descriptive analysis was applied for categorical variables. We did mean ± SD, Pearson's chi-square ($\chi 2$) test and found some amazing association between diabetes mellitus and some of lifestyle predictors.

Results

An overview of socio- demographic characteristics of the study respondents are: More than half of the respondents were found in age group between 39-50 (51.7%) with a majority of the male gender (52.2%). As a Muslim country majority of the respondents were Muslim (81.0%) while most of them were Married (82.9%). Most of the respondents belong to middle-income families (70.2%). 28.3% respondent did not have any formal education and 18 % , 22.9% and 30.7% respondents had primary , secondary and higher secondary or above education respectively. When considering BMI according to the categories proposed

by the WHO, we found that more than half (51.2%) of the respondents, BMI ranges were 23-30 and 48.8% respondents had it was 18-22. 60 % of the respondents had positive family history of Diabetes Mellitus. (Table 1)

From the life style view of the study subjects, more than half (63.4%) of the respondents maintained physical exercise every day. It was also found that 57.1% did not have meal timely and took extra salt in meal (69.8%). Significant amounts (49.3%) of the respondents were smoker where as alcohol abusers were 12.2%. In addition, 29.8% respondents had mild sleeping disturbance. (Table 2) Moreover, study observed the condition related to co-morbidities among the respondents. It was found that, 54.6% respondents have been suffering from cardiovascular diseases and between 86.6% , 40.2% ,30.4% , 26% and 6.3% of those respondents suffering from Hypertension , Heart block, Heart failure , Rheumatic fever and Stroke respectively.

Study revealed that more than half (66.8%) respondents having DM though most (88.8%) of the respondents had adequate Knowledge regarding Diabetes Mellitus. (Table 3 & 4)

To identify the factors associated with having DM the study found a statistically significant association between family history and having Diabetes Mellitus. In addition, having DM is highly significant among the subjects who did not maintain physical exercise regularly (P=.002) and did not take meal timely (P=.00). Furthermore, subjects belonging 51-62 years of age were more prone to have DM (P= 0.00) while DM found more prominent among the subjects having high monthly family income (P=0.00). Another lifestyle related factor, smoking cigarette (P=0.03) has a greater influence on having Diabetes Mellitus. Study did not found statistically significant correlation between knowledge and having Diabetes Mellitus though a significant number had adequate knowledge on DM. (Table 5)

Table 1: Socio-demographic characteristics of the respondents (n=205)

Characteristics		Frequency (n)	Percent (%)
Age	27-38	55	26.8
	39-50	106	51.7
	51-62	44	21.5
Education	Non formal education	58	28.3
	Primary	37	18
	Secondary	47	22.9
	Higher Secondary or above	63	30.7
Religion	Muslim	166	81
	Non-Muslim	39	19

Cont... **Table 1: Socio-demographic characteristics of the respondents (n=205)**

Monthly family income	Low Income	24	11.7
	Medium Income	144	70.2
	High Income	37	18
Marital Status	Married/ Divorced/ Widowed	170	82.9
	Unmarried	35	17.1
BMI	18-22	100	48.8
	23-30	105	51.2
Family History of Diabetes Mellitus	Yes	123	60
	No	82	40

Table 2: Lifestyle related factors of the respondent (n=205)

Characteristics		**Frequency (n)**	**Percent (%)**
Daily maintenance of physical exercise	Yes	130	63.4
	No	75	36.6
Having meal timely	Yes	88	42.9
	No	117	57.1
Smoking	Yes	101	49.3
	No	104	50.7
Taking extra salt in meal	Yes	143	69.8
	No	62	30.2
Alcohol Intake	Yes	25	12.2
	No	180	87.8
Sleeping disturbance	Severe	57	27.8
	Moderate	49	23.9
	Mild	61	29.8
	No	38	18.5

Table 3: Distribution of the respondents by having Diabetes Mellitus (n=205)

Having Diabetes Mellitus	Frequency (n)	Percent (%)
Yes	137	66.8
No	68	33.2
Total	205	100

Table 4: Distribution of the respondents by having knowledge regarding Diabetes Mellitus (n=205)

Having knowledge regarding Diabetes Mellitus	**Frequency (n)**	**Percent (%)**
Adequate knowledge	182	88.8
Inadequate knowledge	23	11.2
Total	205	100

Table 5: Factors associated with having Diabetes Mellitus among the study respondents

Predictors		**Having DM**				**χ2/p**
		Yes		**No**		
		(n)	**(%)**	**(n)**	**(%)**	
Age group	27-38	20	36.4	35	63.6	33.44/0.001s
	39-50	79	74.5	27	25.5	
	51-62	38	86.4	6	13.6	
Monthly family Income	Low income	13	6.3	11	5.4	20.505/0.001s
	Medium income	95	46.3	49	23.9	
	High income	29	14.1	8	3.9	
Family history of DM	Yes	77	62.6	46	37.4	2.48/0.12
	No	60	73.2	22	26.8	

Cont... **Table 5: Factors associated with having Diabetes Mellitus among the study respondents**

Maintenance of physical exercise	Yes	97	74.6	33	25.4	9.72/0.002s
	No	40	53.3	35	46.7	
Cigarette Smoking	Yes	75	74.3	26	25.7	4.96/0.03s
	No	62	59.6	42	40.4	
Having meal timely	Yes	34	38.2	55	61.8	58.15/0.001s
	No	103	88.8	13	11.2	
Knowledge on DM	Adequate knowledge	124	68.1	58	31.9	1.24/0.27
	Inadequate knowledge	13	56.5	10	43.5	

*Chi-square analysis, s= significant

Discussion

This population based descriptive type cross sectional study assessed the level of knowledge and level of Diabetes Mellitus, lifestyles, prevention and co-morbidities related status of the respondents selected as sample population. The study showed, maximum subjects were married and from middle income families while more than half (60 %) of the respondents had family history of Diabetes Mellitus. In addition, a significant amount subjects had Non-formal education. Quite similar data found from an interventional study done in 2002.[23] More than half of the respondents (57.1%) did not have meal timely and 63.4% were maintaining physical exercise every day. 49.3% respondents were smoker and 12.2 % respondents consumed alcohol. 69.8% respondent has been taking eating extra salt in their diet. Co-morbidities related findings of the study subjects are little bit different from another studies conducted in India.[24] Although, maximum respondents had adequate knowledge regarding DM, more than half ware suffering from DM. This observation is likely to similar with the findings from another study conducted in Turkey, where it was found that nearly half (47.6%) respondents had moderate knowledge level on DM and maximum knew the accurate definition of DM while more than half did not have DM.[25] Study found family history as a prominent risk factor of DM. This data is quite similar with the study conducted in Mexico during 2012.[26] A cohort study from 1980 to 1996 found lack of exercise; a poor diet, current smoking, and abstinence from alcohol use were all associated with a significantly increased risk of diabetes, even after adjustment for the body-mass index. This study reflected similar scenario for Bangladeshi socio-demographic region.[27]

Conclusion

In the context of Bangladesh , Diabetes is now become a national health concern but treatment and control are quite low. This population based cross sectional study suggests that those who lived in the disadvantages regions in terms of education and economic profile were found lacking of diagnosis , treatment and control of diabetes. The findings from study suggest that substantial improvements of diabetes detection and treatment are needed in Bangladesh especially among disadvantaged populations. Changing lifestyle , diabetes awareness, dietary habits through well designed public education and mass media campaigns and treatment strategies is urgently needed to prevent the growing burden associated with diabetes.

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Conflict of Interest: None Declared.

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