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Risk Factors for Prevalence of Disability Among Patients of Elevated Blood Pressure

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Abstract

The results presented here were based on the analysis of data collected from 995 Bangladeshi adults of 18 years and above. Among the respondents the percentages of disabled adults and patients of elevated blood pressure were 4.8% and 45.4% , respectively. The percentage of disabled adults among patients of elevated blood pressure was 4.4. Two percent sample adults were suffering simultaneously from disability and elevated blood pressure. The most significant risk factor was age, where the risk for adults of ages 25 – 40 years was 3.46 times for the prevalence of these two- health hazard compared to the risk of adults of other age group. Housewives , secondary level educated persons, diabetic patients of longer duration and obese people had also higher risk of prevalence. But obesity discriminated the patients' group well from other adults..

Key words: disability; elevated blood pressure; socioeconomic factors; risk ratio; discriminant analysis

Introduction:

Disability in human is a body condition that creates some limitations in normal work by a person. Disability may be observed in mind so that the person faces the problem in doing activity what a normal person can do [1, 2, 3, 4, 5]. Even prevalence of diabetes makes it difficult for a person to do normal work [6, 7, 8, 9, 10, 11,12,13]. A disabled person has the limitation in walking, working, hearing, seeing, and even in solving problem. There is trend in increasing the number of disabled persons, especially among older adults [7,14,15.16, 17, 18]. Beside old age, the other causes of disability are obesity, and prevalence of arthritis [19 - 26].

Around one billion people of the world are disabled and most of them live in developing countries [27]. Bangladesh is a developing country, and it was reported that 90% of the Bangladeshi diabetic patients were disabled [28]. Again, reported risk factors for diabetes were old age, illiteracy, physical inactivity, sedentary activity, hypertension, lifestyle, obesity, and food habit [10, 29, 30, 31].

From the above discussion it is understood that disability is associated with obesity, diabetes, hypertension, and many other factors including some disabilities by birth. In this paper an attempt was made to study the risk factors for disability among adult patients of elevated blood pressure.

Methodology

According to the objective of the study the data were recorded from 995 Bangladeshi adults of ages 18 years and above from both urban and rural areas. These adults were visiting some diagnostic centres for their blood and urine screening test. The centres were in both urban and semi-urban areas of Bangladesh. The nurses and medical assistants working in the centres were requested to collect information from the visiting adults through a pre-designed and pre-tested questionnaire in the session 2018 – 19. It had a plan to collect the data from both males and females. It was also decided to cover males and females in the ratio 50.1:49.9 as this ratio had prevailed in the country during the survey period [32].

The questionnaire used for the survey contained different questions on socio-demographic and socioeconomic characteristics of the respondents. Beside the personal data, the other information recorded were prevalence of any of the non-communicable diseases, duration of disease(s), the stages of treatment by doctors/ medical assistants working in the localities. The data on family income and family expenditure were also recorded. The respondents were classified into four classes according to their monthly family income (in thousand taka) and monthly family expenditure (in thousand taka). A respondent was identified as a member of lower economic condition

if monthly family was <50 and expenditure was < 40, or medium economic condition if income was 50 – 100 and expenditure was 40 – 80, or upper medium economic condition if income was 100 – 150 and expenditure was 80 – 120, and higher economic condition if income was 150 and above and expenditure was 120 and above. The respondents were also classified into four groups according to their Body mass index [BMI, weight in kg divided by height in centimetre2]. The four groups were (i) underweight (BMI < 18.5), (ii) normal (18.5 ≤BMI < 23.0), (III) overweight (23.0 < BMI < 27.5), and (iv) Obese (BMI ≥ 27.5) [33,34]. The blood pressure (BP mmHg) of each respondent was measured. According to blood pressure measurement there were 452 patients of elevated blood pressure and among them there were 20 disabled adults, these 20 respondents were identified as patient group.

Elevated blood pressure	Number (N) of adults of different diseases with percentage										Total	
	None except diabetes		Heart problem		Eye problem		Kidney Disease		Disability			
	N	%	N	%	N	%	N	%	N	%	N	%
Yes	309	51.0	35	27.8	65	52.8	23	25.0	20	41.7	452	45.4
No	297	49.0	91	72.2	58	47.2	69	75.0	28	58.3	543	54.6
Total	606	60.9	126	12.7	123	12.4	92	9.2	48	4.8	995	100.0

Table 1: Distribution of Respondents according to Blood pressure and prevalence of Diseases

These patients were discriminated statistically from the remaining adults and responsible variable was identified by the higher absolute value of correlation coefficient of the variable with discriminant function score [36,37, 38, 39].

Some of the collected information were qualitative in nature and some were quantitative variable. But all the information were recorded in nominal scale for ease of analysis. The study variable was prevalence of disability among patients of elevated blood pressure. The association of this variable with other socio-demographic variables was studied. The risk factor of a level of any socio-demographic variable was calculated irrespective of significance of association with the study variable [40]. All the calculations were done using SPSS version 25.

Result

There were 995 respondents of whom 452 (45.4%) were patients of elevated blood

pressure. Among these patients of elevated blood pressure 4.4% were disabled. The percentage of disabled persons having elevated blood pressure was 2.0 in the sample. There were 46.6% urban adults and 2.4% of them were suffering simultaneously from elevated blood pressure and disability. For them the risk of prevalence of the disease under consideration was 40% more compared to the risk of rural adults [R.R.=1.40, C.I.(0.59, 3.35)], though the prevalence rate prevailed in rural adults was not significantly different from the rate observed in urban adults [=0.574, p-value=0.449]. The percentage of Muslim adults was 85.2 and prevalence rate in them was 2.2 which was more than three times than the rate observed in non-Muslim

Socioeconomic Variables	Prevalence of disability in patients of elevated blood pressure				Total	
	Yes		No			
	Number	%	Number	%	Number	%
Residence						
Rural	9	1.7	522	98.3	531	53.4
Urban	11	2.4	453	97.6	464	46.6
Total	20	2.0	975	98.0	995	100.0
Religion						
Muslim	19	2.2	829	97.8	848	85.2
Non-Muslim	1	0.7	146	99.3	147	14.8
Gender						
Male	7	1.4	491	98.6	498	51.1
Female	13	2.6	484	97.4	497	49.9
Marital status						
Married	20	2.2	906	97.8	926	93.1
Single	0	0.0	69	100.0	69	6.9
Age (in years)						
< 25	2	1.0	194	99.0	196	19.7
25 – 40	14	3.5	387	96.5	401	40.3
40 – 50	4	2.0	199	98.0	203	20.4
≥ 50	0	0.0	195	100.0	195	19.6
Education						
Illiterate	1	1.5	64	98.5	65	6.5
Primary	2	1.7	119	98.3	121	12.2
Secondary	7	3.0	230	97.0	237	23.8
Higher	10	1.7	562	98.3	572	57.5
Occupation						
Farming	1	1.0	103	99.0	104	10.5
Business	4	1.7	230	98.3	234	23.5
Service	6	2.0	299	98.0	305	30.7
Retired	2	1.6	120	98.4	122	12.3
Housewife	7	3.0	223	97.0	230	23.1
Economic condition						
Low	9	2.3	376	97.7	385	38.7
Medium	7	1.7	417	98.3	424	42.6
Upper medium	1	1.6	60	98.4	61	6.1
High	3	2.4	122	97.6	125	12.6
Smoking habit						
Yes	3	0.9	326	99.1	329	33.1
No	17	2.6	649	97.4	666	66.9
Involvement in sedentary activity						
Yes	10	2.3	432	97.7	442	44.4
No	10	1.8	543	98.2	553	55.6
Habit of taking process food						
Yes	4	1.1	359	98.9	363	36.5
No	16	2.5	616	97.5	632	63.5
Habit of doing physical work						
Yes	10	2.1	471	97.9	481	48.3
No	10	1.9	504	98.1	514	51.7
Body mass index						
Underweight	0	0.0	38	100.0	38	3.8
Normal	1	0.4	232	99.6	233	23.4
Overweight	9	2.1	415	97.9	424	42.6
Obese	10	3.3	290	96.7	300	30.2
Durstion of diabetes (in years)						
Did not arise	2	0.6	326	99.4	328	33.0
< 5	9	3.1	282	96.9	291	29.2
5 – 10	6	2.9	200	97.1	206	20.7
10 – 15	3	3.0	96	97.0	99	9.9
≥ 15	0	0.0	71	100.0	71	7.1
Total	20	2.0	975	98.0	995	100.0

Table 2: Distribution of respondents according to socioeconomic characteristics and prevalence of disability in patients of elevated blood pressure

respondents. Muslim adults had 3.29 times risk of prevalence than the risk prevailed in their counterpart [R.R.=3.29, C.I.(0.44, 24.39)]. The prevalence rates in Muslim and in non-Muslim respondents were not significantly different [= 1.549, p-value=0.213]. The percentage of married adults was 93.1 and 2.2% of them were facing the problem of elevated blood pressure and disability. None of the single adults faced the problem of this health hazard. The percentage of respondents in the age group 25 – 40 years was 40.3 and 3.5 % of them were the patients of the diseases under consideration. For them the risk of prevalence was 246% more than the risk of other adults [R.R.=3.46, C.I.(1.34, 8.93)] and the prevalence rate in them was significantly higher than the prevalence rates observed in adults of other age groups [=9.443, p-value= 0.024]. The percentage of secondary level educated adults was 23.8. The prevalence rate in them was 3.0% which was bigger than the rates observed in adults of other levels of education. For them the risk of prevalence was 1.72 times compared to the risk prevailed for others [R.R.=1.72, C.I.(0.69, 4.43)]. However, the prevalence rates observed in adults of different levels of education were not statistically different [= 1.422, p-value= 0.700]. Percentage of housewives in the sample was 23.1 and prevalence rate in them was 3.0% followed by the prevalence rate in servicepersons (2.0%). The prevalence rates in other professionals were less than 2.0%. But the rates were statistically similar [= 2.023, p-value= 0.732]. Housewives had 79% more risk of prevalence. There were 12.6% adults of families of high economic condition. The prevalence rate in them was 2.4% which was higher than the rates for adults of other economic conditions. However, the rates prevailed for adults of different economic conditions were statistically similar [= 0.626, p-value=0.732]. Adults of families of higher economic condition had 23% more risk of prevalence compared to the risks prevailed in adults of families of other economic conditions [R.R.=1.23, C.I.(0.37, 4.14)].

There were 33.1% smokers in the sample, the prevalence rate in them was 0.9% and the risk of prevalence for them was only 0.36 times compared to the risk of prevalence for non-smokers [R.R.=O.36, C.I.(0.11, 1.22)]. Smokers and non-smokers were statistically similar in terms of affecting by the diseases under conditions [=3.010, p-value=0.083]. There were 44.4% adults who were involved in sedentary activities. The prevalence rate in them was 2.3% which was bigger than the rate observed in adults not involved in sedentary activities (1.8%). But these two rates were not significantly different [=0.257, p-value=0.612] . The risk of prevalence of the diseases under consideration was only 25% more for adults involved in sdentary activities [R.R.=1.25, C.I.(0.52, 2.98)]. The percentage of adults habituated in consumption of process food was 36.5, the prevalence rate in them was only1.1%. But this rate was not significantly lower than the rate (2.5%) prevailed in adults not habituated in process food . These rates were not significantly different [= 2.393, p-value= 0.122[. The risk of prevalence for process food consumers was only 0.44 times [R.R.=0.44, C.I.(0.15, 1.31]. The percentage of respondents habituated in physical activity was 48.3, the prevalence rate in them was 2.1%. The rate observed in adults not habituated in physical work was 1.9%. These two rates were statistically similar [=0.022, p-value=0.881]. Habit of physical inactivity was not a risk factor for prevalence of disability in patients of elevated blood pressure [R.R.= 1.07, C.I.(0.45, 2.55)].

There were 30.2% obese adults in the sample, the prevalence rate in them was 3.3%. But this rate was not significantly higher than the rates prevailed in adults of other levels of body mass index [= 6.430, p-value=0.092]. However, obese adults had 134% more risk of prevaence [R.R.=2.34, C.I.(0.98, 5.66)]. The percentage of diabetic patients suffering for less than 5 years was 29.2, the prevalence rate in them was 3.1% followed by the rate observed (3.0%) in patients suffering for 10 to lass than 15 years. However, the prevalence rates observed in diabetic patients suffering for different periods were found statistically similar [= 7.929, p-value= 0.098]. The risk of prevalence in patients suffering for less than 5 years was 98% more than it was observed in patients suffering for other duration of diabetes [R.R. = 1.98, C.I. (0.82, 5.36)].

Results of Discriminant Analysis Diacriminant analysis was performed to identify some responsiible variables which discriminate patient group from others. There were 20 adults suffering simultaneously from disability and elevated blood pressure. The objective was to discriminate this group from others. During discrimination some variables were identified as responsible ones .

The variables included in the analysis were residence, religion, gender, marital status, age, education, occupation, socioeconomic condition, body mass index, duration of diabetes, smoking habit, involvement in sedentary activity, habit of doing physical work , and habit of taking process food. Initial results of discriminant analysis were Wilk's Lambda = 0.978, = 21.693, and p-value= 0.085. The other results were shown in Table 3. The variables were presented in the table below according to the higher absolute value of correlation coefficien of the variable and discriminant function score. The highest correlation coeffcient cofficient was 0.533 for the variable body mass index. This variable well discriminated the patients group from other adults. Body mass index was the most responsible variable for discrimination followed by smoking habit

Socioeconomic variables	Correlation coefficient	Discriminant function coefficient	Wilk's Lambda	F- value	p-value
Body mass index	0.533	0.588	0.994	6.275	0.012
Smoking habit	0.369	0.380	0.997	3.013	0.082
Habit of taking process food	-0.329	-0.513	0.998	2.394	0.122
Gender	0.289	0.052	0.998	1.849	0.174
Age	-0.284	-0.413	0.998	1.778	0.183
Occupation	0.266	0.127	0.998	1.567	0.211
Religion	-0.265	-0.246	0.998	1.548	0.214
Marital status	-0.262	-0.180	0.998	1.520	0.218
Duration of diabetes	0.165	0.357	0.999	0.600	0.439
Residence	0.161	0.287	0.999	0.573	0.449
Sedentary activity	0.018	-0.042	1.000	0.257	0.612
Habit of doing physical work	0.032	0.039	1.000	0.022	0.881
Economic condition	-0.025	0.127	1.000	0.014	0.905
Education	-0.024	-0.014	1.000	0.012	0.912

Table 3 : Results of discriminant snslysis

Discussion

Simultaneous prevalemce of diabetes and disability, diabetes and hypertension were observed among adults of different cuntries including Bangladesh [5, 7, 9 – 12, 18, 31]. Thus, disability and hypertension are expected to be associated and the reported responsible variable for the problem was old age, bodymass index, illiteracy, physical inactivity [10, 19, 41]. In this paper attempt was made to identify the risk factors for the prevalence of disability among the patients of elevated blood pressure.

Out of 995 investigated adults 452 had elevated blood pressure. Twenty (2.0% sample adults) adults of this group were found disable. The percentage of disable adults among patients of elevated blood pressure was 4.4. The percentages of urban and rural adults were 46.6 and 53.4 respectively; male and female were in the ratio 50.1: 49.9, and diabetic and non-diabetic respondents were in the ratio 67.0: 33.0 The prevalence rates in urban adults, in females and in diabetic patients were 2.4, 2.6, and 2.7, respectively. These 3 rates were higher than the rate observed among sample adults. Higher prevalence rates were also noted among Muslims, secondary level educated persons, respondents of ages 25 – 40 years, housewives, adults belonged to families of higher economic condition, persons involved in sedentary activity, physically inactive adults, and obese adults. However, prevalence of disability in patients of elevated blood pressure was significantly associated with age. Due to body mass index ,patients group was significantly different from other adults. This was noted in discriminating the two groups of adults.

Conclusion

The study was conducted to identify the risk factors for prevalence of disability among patients of elvated blood pressure. The sample adults were 995, out of which 45.4% had the problem of elevated blood pressure, 4.8% were disabled, and 2.0% were facing simultaneously from disability and elevated blood pressure. The risk of prevalence of the diseases under cosideration was more among urban adults, Muslims and females. Married persons, adults of age group 25 – 40 years, secondary level educated persons, housewives, adults of families of high economic condition, adults involved in sedentary activity, physically inactive adults, obese adults, and diabetic patients who were suffering for less than 5 years had higher risk of prevalence. Smoking and habit of taking process food were not the risk factors for prevalence of the diseases under consideration. Muslims and adults of age group 25 – 40 years were more exposed to this health hazazrd. The patient group was significantly different from others due to obesity. It was noted from the results ofdiscriminant analysis.

By birth some babies are found disabled. But due to prevalence of diabtes, hypertension, obesity, and some other non-comminicable diseases people become disabled. The influences of these variables cannot be avoided but can be reduced if people become concisus about their lifestyle and try to follow some basic criteria in maintaining healthy life. Government can do a lot in introducing rules and regulations so that social protection system and public health care system become positive for the disabled persons. The disabled persons should be protected from poverty. Laws and policies which may create problems to disabled persons are to be eliminated.

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