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Determinant Factors of Diseases Suffering Duration among Elderly in Bangladesh

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Abstract

Objective: This study aimed to identify the determinant factors of disease suffering duration among elderly population in the rural areas of Bangladesh.

Methods: A cross-sectional study was conducted in three villages of Pabna District, Bangladesh. Data were collected from 250 (males, 168; females, 82) elderly aged 60 years and above using a structured questionnaire. To analyze the data, both bivariate and multivariate analyses were used as the statistical tools.

Findings: The results revealed that most of the elderly (70.00%) were suffered from various types of long duration (>1 year) diseases. Respondents' age, partnership status, family type, family size, education, working status, family income, and drug addiction were found significantly associated with diseases suffering duration. Finally, the binary logistic regression model identified almost all the factors are as important predictors diseases suffering duration.

Conclusion: Health problems were found more prevalent among males than that of females. To reduce the disease suffering duration of the elderly, emphasis should be given to improve their financial condition and traditional family bond, and to create workplaces where they may involve.

Keywords: Age; Health problems; Education; Life expectancy

Introduction

Population aging is a process of increasing the number of persons aged 60 years and over and it is often considered as the global public health success. The age structure of world population has been experiencing the significant change during the period 1950-2013. The number of aging population increasing rapidly and the proportion of children and youth population are decreasing. In 1950, the number of world aged population was about 200 million, constituting 8.10% of the global population. Now, it is 841 million constituting 11.70% and it will be doubled by 2050 and constituted 21.10% of total global population [1]. Aging has started earlier in the developed countries and beginning a health issue in some developing countries like Bangladesh [2]. Now, Bangladesh is passing throughout the third stage of demographic transition which produces huge numbers of youthful and elderly population. As a small country of 1,47,570 sq. km land area Bangladesh [3] is the 8th largest and one of the most densely populated (1,101 persons/sq.km) country in the world [4]. During the years 1974-2013, in Bangladesh the number of aged population has been increased from 1.38 million to 10.05 million and placed 122 ranked in the globe [1]. The rapidly increasing number and diversity of elderly, Bangladeshis has far-reaching implications for public health system and will place unprecedented demands on aging services and the nation's entire healthcare system. The increased elderly population consequences problems like physical and mental health along with the social and economic burdens [5]. In addition, the increasing proportion of landless population, changes in life styles, and rural to urban migration lead to smaller families put the elderly into more vulnerable situation [6-8]. Importantly, the vulnerability of elderly population reflected to the higher burden of ill health and disability and they have received a little attention from primary healthcare services [9]. On the other hand, elderly persons in better health may have a longer life expectancy than those in poorer health. In this regard, higher gross national income and availability of healthcare resources are prerequisite factors for longer life expectancy [10-13].

Research works on elderly have traditionally been focused on demographic factors [2,8,14,15] social problems, [16,17] economic burdens, [18,19] healthcare services, [20,21] and disabilities [22,23]. However, relatively a few research works have investigated the determinant factors affecting on the diseases suffering duration of elderly. Therefore, this study aimed to identify the determinant factors which are responsible for disease suffering duration of elderly in the rural areas of Bangladesh. The authors hope that this study will be very helpful in identifying the risk factors of disease suffering duration and the findings will help the policy makers and researchers to determine how to reduce the duration of diseases of the elderly.

Data and Methods

Data and necessary information were collected from 250 (males, 168; females 82) elderly 60 years and above. Face to face interview was conducted from May 20 to June 15, 2013 in three villages of Malonchi Union in Pabna District, Bangladesh. Respondents were interviewed using purposive sampling technique through a structured

questionnaire. In univariate analysis, the percentage distribution of demographic and socioeconomic and disease related characteristics are presented in tables. The bivariate analysis (χ^2-test) was used to determine the significant associations between socioeconomic, demographic and health related factors with disease suffering duration. In multivariate analysis, binary logistic regression model was used to evaluate the effects of some factors contributed to disease suffering duration (dependent variable, Y). The underlying multiple logistic regression models corresponding to each variable are:

$$\log \frac{P}{1-P} \left(=\beta_o + \right)\beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 +$$

$$\beta_7 X_7 + \beta_8 X_8 \rightarrow (1)$$

where, P, the probability of long duration disease suffering (>1 year) (coded 1) and 1-P, the probability of short duration disease suffering ($\leq$ 1 year) (coded 0); X_i, i=1,2,…..8 are the explanatory variables; β_o, the intercept term, and β_i, i=1,2,…..8 are the unknown logistic regression coefficients. The parameter β_i refers to the effects of X_i on the log odds such that Y=1, controlling the other X_i. There is an important assumption in multiple regressions, either linear or logistic, that there is no multi-collinearity problem (dependent each to other) among the independent variables. However, there is no exact method to detect the multi-collinearity problem in multiple logistic regression analysis. In this study, the magnitude of the standard error (SE) was used to detect the multi-collinearity problem, if the magnitude of the SE lies between 0.001 and 0.5, it is judged that there is no evidence of multi-collinearity [24]. In binary logistic regression model (Equation 1), eight explanatory variables with categories shown in parenthesis; age (X1) (year) (60-70, 1; >70, 2), current partnership status (X2) (yes, 1; otherwise, 0), type of family (X3) (single family, 1; joint family, 2), family size (X4) ($\leq$ 5, 1; >5, 2), education (X5) (illiterate, 0; literate, 1), present working status (X6) (no, 0; yes, 1), monthly family income (X7) (Taka) ($\leq$ 6000, 1; >6000, 2), and any form of drug addiction (X8) (no, 0; yes, 1). Statistical Package for Social Sciences (SPSS) version 16.0 (SPSS Inc., Chicago, IL, USA) was used for statistical analysis.

Results

Univariate, bivariate and multivariate approaches have been applied in the analysis. The results are presented in the subsequent sections.

Univariate analysis

The background statistics of the elderly were presented in Table 1. Among the total elderly populations, 82 (32.80%) were females and 168 (67.20%) were males. The results revealed that most of the elderly (79.60%; males, 77.38%; females, 84.14%) were found in the age group $\leq$ 70 year. Almost all elderly (81.20%; males, 89.29%; females, 64.63%) were leading the formal partnership lives. More than half elderly (52.80%; males, 51.79%; females, 54.88%) were lived in the nuclear families. The economic status of elderly was considered their monthly family income and found that almost all were lived in the low income family (84%; monthly family income, 6,000Tk or less). It is also found that most of the respondents (56.40%) have had a smaller amount ($\leq$ 100 decimal) cultivated land, and lived in clay made houses (62.80%).

The percentage distributions of health-related characteristics by sexes of the elderly are presented in Table 2. The results revealed that almost all elderly (84.40%) were having health problems and these health problems were found more prevalent among males (86.90%). In case of disease types, the elderly were suffered from different types of diseases, viz., Arthritis, Insomnia, Joint pain, Diabetics, etc. Among

these diseases, Insomnia (45.97%; males, 39.04%; females, 48.78%) and eye problem (44.55%; males, 24.66%; females, 39.02%) we found more prevalent. In case of treatment costs, usually their sons (47.20%) bear it, and also the elderly accompanied their sons (43.20%) when they were sick. The elderly were demanded more family care and proper treatment. A few elderly (20.40%) go to the registered doctors when they were sick.

Characteristics	Covariates	Gender		Total
		Male (n=168)	Female (n=82)	
Age (year)	60-70	130 (77.38)	69 (84.14)	199 (79.60)
	>70	38(22.62)	13(15.84)	51(20.40)
Religion	Islam	167(99.40)	79 (96.34)	246(98.40)
	Others	1 (0.60)	3 (3.66)	4 (1.60)
Life partnership status	Having partner	150 (89.29)	53 (64.63)	203 (81.20)
	Others	18 (10.71)	29 (35.37)	57 (18.80)
Family type	Nuclear	87 (51.79)	45 (54.88)	132 (52.80)
	Joint	81 (48.21)	37 (45.12)	118 (47.20)
Family size	$\leq$ 5	91 (54.17)	41 (50.00)	132 (52.80)
	>5	77 (45.83)	41 (50.00)	118 (47.20)
Monthly family income (Taka)	$\leq$ 6000	146 (86.90)	64 (78.05)	210 (84.00)
	>6000	22 (13.10)	18 (21.95)	40 (16.00)
Education	Illiterate	97 (57.74)	53 (64.63)	150 (60.00)
	Literate	71 (42.26)	29 (35.37)	100 (40.00)
Having cultivated land (decimal)	$\leq$ 100	91 (54.17)	50 (60.98)	141 (56.40)
	>100	77 (45.83)	32 (39.02)	109 (43.60)
Housing condition	Clay made	106 (63.09)	51 (62.20)	157 (62.80)
	Others	62 (36.91)	31 (37.80)	93 (37.20)

Table 1: Distribution of socioeconomic condition by genders of elderly, (N=250). Note: The numbers inside the parenthesis indicate the percentages.

Characteristics	Covariates	Gender		Total
		Male (n=168)	Female (n=82)	
Having health problems	Yes	146(86.90)	65(79.27)	211(84.40)
	No	22(13.10)	17(20.73)	39(15.60)
Types of Health problems*	Arthritis	53(36.30)	17(20.73)	70(33.18)
	Insomnia	57(39.04)	40(48.78)	97(45.97)
	Joint pain	42(28.77)	11(13.41)	53(25.12)
	Diabetes	24(16.44)	18(21.95)	42(19.91)
	Eye problem	62(24.66)	32(39.03)	94(44.55)

		≤ 1 year	>1year	Total
	Heart disease	13(8.90)	8(9.76)	21(9.95)
	High blood pressure	8(5.48)	5(6.09)	13(6.16)
	Asthma	8(5.48)	4(4.87)	12(5.69)
	Waist/ back pain	8(5.48)	8(9.75)	16(7.58)
	Ulcer	7(4.79)	9(10.97)	16(7.58)
Bearing treatment costs	Own	79(47.01)	30(17.88)	109(43.60)
	Son	72(42.86)	46(27.38)	118(47.20)
	Daughter	8(4.76)	2(1.19)	10(4.00)
	Others	9(5.36)	4(2.38)	13(5.20)
Accompany when sick	Alone	38(22.62)	21(12.50)	59(23.60)
	Son	66(39.29)	42(25.00)	108(43.20)
	Daughter	24(14.29)	10(5.95)	34(13.60)
	Others	40(23.81)	9(5.38)	49(19.60)
Needs of elderly population	Proper treatments	35(20.83)	16(9.52)	51(20.40)
	Food	14(8.33)	20(11.90)	34(13.60)
	Social security	39(23.21)	15(8.93)	54(21.60)
	Safe housing	26(15.48)	20(11.90)	46(18.40)
	Family care	54(32.14)	11(6.56)	65(26.00)
Treatment sources	Self-treatment	16(9.52)	15(8.93)	31(12.40)
	Drugstore salesman	43(25.60)	9(5.36)	52(20.80)
	Traditional treatment	2(1.19)	13(7.74)	15(6.00)
	Paraprofessional	70(41.67)	31(18.45)	101(40.40)
	Registered doctor	37(22.02)	14(8.33)	51(20.40)

Table 2: Distribution of health-related characteristics by genders of elderly, (N=250). Note: *Only those diseases were shown in the table prevalence of which was exceeds 5% in the total samples. The numbers inside the parenthesis indicate the percentages.

Bivariate analysis

In bivariate analysis, the Chi-squared (χ^2) test was applied to determine whether there is a significant association between disease suffering duration and other characteristics of the elderly and the results are presented in Table 3. The results revealed that among the factors, age ($p<0.05$), partnership status ($p<0.01$), family type ($p<0.05$), family size ($p<0.05$), education ($p<0.05$), working status ($p<0.05$), income ($p<0.05$), and drug addiction ($p<0.01$) were found statistically significantly associated with disease suffering duration.

The disease suffering duration was classified into two types, viz., short duration (≤ 1 year), and long duration (>1 year). The results showed that most of the elderly (70.00%) were suffered from long duration diseases and higher percentage respondents were found

among the elderly aged >70 years, males, not have life partners, living in nuclear family, having less family members, illiterate, workless, lower family income, and drug addiction.

Characteristics	Covariates	Disease suffering duration		Total	P values
		≤ 1 year (n=75)	>1year (n=17s5)		
Age (year)	60-70	63(31.70)	136(68.30)	199	0.048
	>70	12(23.53)	39(76.47)	51	
Gender	Male	48(28.60)	120(71.40)	168	0.498
	Female	27(32.90)	55(67.10)	82	
Partnership status	Having partner	64(31.50)	139(68.50)	203	0.017
	Others	11(23.40)	36(76.60)	47	
Family type	Nuclear	19(14.39)	113(85.61)	132	0.04
	Joint	56(47.45)	62(52.55)	118	
Family size	≤ 5	19(14.39)	113(85.61)	132	0.04
	>5	56(47.45)	62(52.55)	118	
Education	Illiterate	48(31.80)	103(68.20)	151	0.048
	Literate	27(27.30)	72(72.70)	99	
Working status	Yes	47(34.60)	89(65.40)	136	0.046
	No	28(24.60)	86(75.40)	114	
Monthly family income (Taka)	≤ 6000	39(36.10)	69(63.90)	108	0.036
	>6000	36(25.40)	106(74.60)	142	
Behavior of family member	Good	64(31.10)	142(68.90)	206	0.425
	Not so good	11(25.00)	33(75.00)	44	
Drug addiction	Yes	24(22.20)	84(77.80)	108	0.019
	No	51(35.90)	91(64.10)	142	
Having cultivated land (in decimal)	≤ 100	44(31.20)	97(68.80)	141	0.19
	>100	31(28.40)	78(71.60)	109	
Total		75(30.00)	175(70.00)	250	

Table 3: Association between disease suffering duration, and socioeconomic and health factors. Note: The numbers inside the parenthesis indicate the percentages.

Multivariate analysis

Independent variables	Disease suffering duration (Y)				
	Coefficient (β)	SE of (β)	Odds Ratio (OR)	95% CI of OR	
				Lower	Upper
Age (X1) (years) (60-70 Vs >70)	-0.059	0.405	0.943**	0.427	2.085

Partnership status (X2) (Having partner Vs otherwise)	0.580	0.438	1.786**	0.756	4.217
Family types (X3) (Single family Vs Joint)	-0.137	0.327	0.872***	0.459	1.656
Family size (X4) (≤ 5 Vs >5)	-0.551	0.318	0.577**	0.309	1.076
Education (X5) (Illiterate Vs Literate)	0.518	0.345	1.679	0.854	3.301
Currently working (X6) (Yes Vs No)	0.560	0.334	1.750***	0.909	3.370
Monthly family income (X7) (Taka) (≤ 6000 Vs >6000)	-0.499	0.338	0.607***	0.313	1.178
Drug addiction (X8) (Yes Vs No)	-0.580	0.323	1.297***	0.542	1.678

Table 4: Results of binary logistic regression analysis. Note: Vs: Versus; **$P<0.05$; ***$P<0.01$; CI; Confidence Interval.

Impacts of the associated factors on 'disease suffering duration' are identified by the binary logistic regression analysis and the results are presented in Table 4. The binary logistic model identified that the respondents' age, partnership status, family type, family size, working status, income, and drug addiction were the significant predictors of disease suffering duration. It is found that long duration disease suffering was 5.70% (OR: 0.943, 95% CI: 0.427-2.085) lower risks among the elderly aged at most 70 years as compared to the elderly whose age more than 70 years. The life partner less elderly were faced 1.786 (OR: 1.786, 95% CI: 0.756-4.217) times more risk of having long duration diseases suffering compared to the elderly with having life partners. The risk of having long duration disease suffering 12.80% (OR: 0.872, 95% CI: 0.459-1.656) and 42.3% (OR: 0.577, 95% CI: 0.309-1.076) less among the elderly living with joint family and having family member more than 5, respectively. The respondents were found 1.75 (OR: 1.750, 95% CI: 0.909-3.370) times higher risk of suffering long duration diseases who were separated from any kind of formal works compared to them who were currently involved any types of works. The risk of having long duration disease sufferings were also found 39.30% (OR: 0.607, 95% CI: 0.313-1.178) higher among the elderly who have had less family income. In case of the drug addiction, the elderly who used any type of drug were 1.297 (OR: 1.297, 95% CI: 0.542-1.678) times higher risk to be suffered from long duration diseases compared to the elderly who did not use drug.

Discussion

Aging is the ultimate reality of human life and one of the natural and unavoidable demographic processes. The developed countries realize this reality and evolve policy instrument in the form of the social security as well as care for the elderly through institutions like old homes, geriatric hospitals, old recreation center and many other public and private care systems. But, still now these policy instruments are at a primary stage in developing countries like Bangladesh. Most of the developing countries are young in terms of the population age structure and they are becoming older more rapidly than the industrialized nations. These changes in the population distributions may have the serious implication and requires a special attention for the elderly. In view of gradual increment of the number of elderly population in Bangladesh, they are becoming more vulnerable in the society. Most of the elderly suffer from various types of chronic health complications. But, very little support is available through the public and governmental programs for the welfare of the elderly. Through the findings of this study, a clear picture is presented in context of diseases prevalence and disease suffering duration of the elderly in the rural areas of Bangladesh.

In this study, it is found that almost all elderly (84.40%) were suffered from different types of diseases and of them 70% elderly were suffering long duration diseases (>1 year). Similar results were observed in the previous studies [21,25] In case of disease types, around half of the total elderly were suffered from insomnia (45.97%) and eye problems (44.55%). This finding slightly supported to the findings of Kalam and Khan [21] but directly opposite to the findings of Khanam et al [25] that arthritis is the most common health problem among the elderly in Bangladesh. Traditionally older adults in Bangladesh depend on their family members and they provide companionship, food, shelter and the healthcare services. But, rapid socioeconomic and demographic transformation, mass poverty, declining social and religious values, influence of western cultures, and other factors have broken down the traditional systems. These socioeconomic transformations will certainly put the welfare of the elderly in jeopardy. This study showed that, the elderly were bearing their treatment costs by themselves (43.60%) and by their sons (47.20%), respectively. Elderly with self-treatment costs bearing are increasing; on the other hand, son's treatment cost bearing decreasing. This is due to the breakup the traditional family's structure [21,26]. Received accompany when they were sick, needs of the elderly shown the different patterns in the previous studies' findings [21,27]. Generally, elderly prefer to live in family atmosphere and kinship bond. But, they suffer physically and psychological problems when these traditional family atmosphere and kinship bond are broking and this will support the energy of affecting them long term disease suffering. In this study, it has been observed that, long term diseases were observed more prevalent among the elderly in a single or nuclear family with family members less than 5. This findings is consistent with the findings of others studies [15,27].

This study evidently identified the disease suffering duration increasing with the increasing of age. Long duration diseases are also observed and these are more established among the elderly who are currently involved in forms of work. In this regard, some studies have identified that disease and the disease suffering duration both were increasing day by day and presently workless elderly were more sufferers compared to the elderly who were involved any type of works [8,21,27] The long duration disease suffering are also observed more common among currently partner less elderly. Elderly with having a partner are able to share their sorrows and happiness and enjoy their better healthy lives than that of partner less elderly. In fact, the findings are consistent with the findings to the previous studies [21,27].

The mail limitation of this study is that it was a community based survey and performed by one investigator. Again, it is limited to one union of the Northern region of Bangladesh due to the time, money manpower constrains. Moreover, all the diseases were recorded as perceived by the elderly and no diagnostic and clinical tests were done to confirm or refute the same diseases. Many of the elderly respondents try to hide their real situation on some aspects.

Conclusion

The study identified the risk factors of disease suffering duration and disease prevalence among the elderly in the rural areas of Bangladesh. Most of the elderly were suffered from different types of long term diseases and majorities were suffered from multiple diseases. Among the diseases of the respondents, Insomnia was found highest followed by the eye problem, joint pain and so on. The sons of the elderly were found to be most responsible persons who bear the treatment costs and give accompany when they were sick. In most of the cases, the respondents did not visit the registered doctors. The elderly aged 70 and above, lived in the single family, with less family members, currently workless, low family income, and drug addicted were more sufferer of the long term diseases. The study results have some policy implications for the elderly, especially living in the rural areas in Bangladesh. Urgent action is needed to improve their quality of life through the reduction of disease prevalence and disease suffering duration. Government and non-government efforts should aim to increase their health care services. We analyzed data from three villages of a union of Pabna District, Bangladesh. To identify the risk factors that influence the disease suffering duration of the elderly, future research should evaluate larger datasets and wider range of factors.

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