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Level of Depression and Associated Risk Factors among the Elderly in Sylhet District, Bangladesh

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Abstract

Depression in the elderly is a public health problem. This work is an attempts to assess the prevalence of depression and to identify the socio-demographic risk factors associated with the depression of the elderly. Two-stage random sampling for urban and multistage random sampling technique for rural were employed, a cross sectional study of 944 elderly persons aged 55 or more were collected from the Sylhet district in Bangladesh. The Short Form of the Geriatric Depression Scale (GDS-15) was used to collect relevant data. The mean (± SD) age of the elderly is 62.66 (± 8.95) years. The prevalence of depression was 52.5% followed by mild or moderate depression 43.2%. Even 9.3% of the elderly were severely depressed. Findings of the study revealed that more aged, female, housewife or others, spouseless, Muslim, belonging to nuclear family and living alone elderly were found to be more depressed with their counterparts. A visible association was observed between the socio-demographic factors and the level of depression in the elderly. The findings found age, sex, occupational and marital status, religion, type of family, and living status of the elderly as significant factors related to depression level. These outcomes will be helpful for geriatric health policy makers in Bangladesh.

Keywords: Elderly, Depression, Geriatric Depression Scale (GDS), Bangladesh.

AMS Classification: 97Cxx.

1. Introduction

Depression is a medical illness characterized by persistent sadness, discouragement, and loss of self-worth. It can be accompanied by decreased energy and concentration, sleep problems (insomnia), loss of appetite, weight loss, and physical pain ("Depression Elderly," 2008). Improvement in living standards and health and medical services increases life expectancy. Adults are at higher risk of psychiatric problems and depression is a common geriatric mental illness. Healthcare systems around the world face major challenges in improving the overall health and quality of life of their elderly population (Knickman & Snell, 2002).

Depression in particular is common in older adults. Elders in Bangladesh face many mental, social, and physical health problems. Numerous studies have been conducted globally to study the depression among elderly. The prevalence of depression has been reported to be 19.5% in western countries (Volkert et al., 2013), 27.8% in Sri Lanka (Malhotra, Chan, & Østbye, 2009), 23% in Pakistan (Ganatra et al., 2008), 58% in Iran (Sajadi et al., 2013), 13.3% in Singapore (Niti et al., 2007), 12.5% in Hong Kong (Chi et al., 2005), 30.8% in China (Gao et al., 2009), 37.5% in rural communities in Nepal (Khattri et al., 2013), 20% - 34% in South Korea (Kim, Choe & Chae, 2009), 19.8–33.5% in Japan (Wada et al., 2004), and 20.1% in urban elders in Taiwan (Chiu et al., 2005). It is found that the prevalence of depression among those aged above 50 years is highest in India (27.1%) followed by Mexico (23.7%), Russia (15.6%), Ghana (11%), South Africa (6.4%), and at least in China(2.6%). It was also found that female adults were suffering more likely to be depressed than male older adults (Anand, 2015).

Studies done in Bangladesh are relatively sparse. Here, the first national survey conducted between the year 2003 and 2005 on mental health demonstrated that 16.1% of the adult population had some form of mental illness and also stated that the prevalence of mental disorder was higher among women (19%) than men (12.9%) (Islam & Biswas, 2015; MM, 2007). Previous studies conducted in Bangladesh have reported the prevalence of mental disorders ranges from 6.5 to 31.0% among adults depending on the community or clinic setting, and women seemed to be more vulnerable (Hossain et al., 2014)..

Risk factors for depression in late life include female, medical illness and injury, disability and functional decline, cognitive impairment, negative life events, low

SES, spouseless, lack of social support, and social isolation (Alexopoulos, 2005; Blazer, 2003; Bruce, 2002; Djernes, 2006; Heun & Hein, 2005; N, 2003). According to WHO, older adults at risk of developing depression include genetic susceptibility, chronic disease and disability, pain, frustration with limitations in activities of daily living (ADL), personality traits (dependent, anxious or avoidant), adverse life events (separation, divorce, bereavement, poverty, and social isolation) and lack of adequate social support (Organization, 2001). Many studies have demonstrated a relationship between depression and various socio-demographic variables such as advanced age, gender, education, religious status, type of family, residence, poverty, and occupation (Das et al., 2014; Karim et al., 2006; Hossain et al., 2014). However, there is a lack of study concerning the issues of geriatric depression-related problems in Bangladesh. In connection with depression, only one previous study has been found (Das et al., 2014), which means there is a huge research gap in the country, where amplified information would be helpful in preventive approaches. Therefore, the present study was conducted to observe the prevalence of depression levels among the elderly and also to determine the influential socio-demographic risk factors for depression using the geriatric depression scale (GDS-15).

2. Materials and Methods

The data comes from a cross-sectional study of men and women aged 55 years and older from the Sylhet District, Bangladesh. A multi-indicator survey design was prepared to explore a number of different and diverse issues related to the health of the elderly through a structured questionnaire. Two-stage random sampling for urban (City Corporation) and multi-stage random sampling for rural areas in Sylhet district have been used to get a random sample of 944 elderly people of both males and females. The health profile of the elderly were collected and documented including self-assessment health problems, biomarkers, performance of daily activities, geriatric depression scale for short form, and socio-demographic information of the aged person. A trained manpower has been employed and necessary medical equipment was also used to collect quality data.

2.1. Sample Size Selection

The proposed area has been taken from the Sylhet District in two phases like urban and rural areas. The first phase is taken from the urban area of this study

was the Sylhet City Corporation, Bangladesh, and all administrative Wards were included. The second phase is taken from the rural area of Sylhet district, Bangladesh.

For First Phase: The population size for this study is N = 35917 where male elderly N1 =19732 and female elderly N2 = 16185 (BBS, 2014). The required sample size is n=$\frac{z^2 p(1-p)^2}{e^2} \approx 381$ where, z = 1.96, p = proportion of male elderly = 0.55 and e = margin of error = 0.05. According to the proportional allocation of sample sizes, the required sample size for male elderly n_1 = 210 and female elderly n_2 = 171. The formula provided that the required sample size was 381 for this study. For the sake of complexity 472 elderly information has been collected from the urban areas of Sylhet City Corporation.

For Second Phase: The required minimum sample size is n=$\frac{p(1-p){z^2}_{\alpha/2}}{d^2} \approx 384$ where, n= sample size, $z_{\alpha/2}$ = 1.96, p = 0.5 (for unknown cases) and d = precision (0.05; maximum 0.10). For the sake of complexity 472 elderly information has been collected from the rural areas of the Sylhet district.

2.2. Sampling Techniques

For First Phase: The two-stage random sampling technique was used to select samples from Sylhet City Corporation areas. There are 27 administrative Wards of Sylhet City Corporation. In the first stage, about half (13) of the 27 Wards had been selected by simple random sampling. In the second stage, at least 35 elder people from both male and female had been taken randomly to cover a minimum sample of size 472 from each selected Wards. The Ward Councilors office helped us by providing all the necessary information.

For Second Phase: The multi-stage random sampling technique was used to select sampling units from rural areas in Sylhet District. There are 13 Upazilas in Sylhet District. In the first stage, about one-third (4) Upazilas of the 13 Upazilas have been selected by simple random sampling (SRS). In the second stage, one union Parishad has been selected from each selected Upazila by SRS. In the third stage, two wards have been selected from each selected union Parishad by SRS. In the fourth stage, at least 55 elder peoples from both males and females had been taken randomly to cover 472 respondents which have finally been chosen 8 administrative wards. A list of union Parishad and religious points (Mosque and Mandir) has been made in the study area from which the sample was collected

randomly. The Union Parishad Chairman and his Ward Councilors office, Social Services Officer, and his staff were also helped us by providing all necessary information for collecting our required data.

2.3. Measurement and Coding of variables used in geriatric depression scale (GDS)

The Geriatric Depression Scale (GDS) was developed as a simple, easy-to-use tool to screen for depression in older adults; the original GDS Long Form is a 30-item questionnaire in which participants are asked to answer Yes or No to questions about their feelings over the past week (Yesavage et al., 1983). A Short Form GDS (GDS-15) was developed later, incorporating 15 questions from the Original Long Form GDS that correlated most strongly with depression in validation studies (Sheikh and Yesavage, 1986). Of the 15 items, 10 indicated the presence of depression when answered positively, while the rest (question numbers 1, 5, 7, 11, 13) indicated depression when answered negatively. The Short Form is more easily used by physically ill and mildly to moderately demented patients who have short attention spans and/or feel easily fatigued. It takes about 5 to 7 minutes to complete. The Geriatric Depression Scale (GDS-15) is a valid tool for detecting depression among elderly persons residing in community settings.

To measure geriatric depression (Table 1), we followed the short form (Sheikh and Yesavage, 1986) of the Geriatric Depression Scale.

Table 1: Variables Related to Geriatric Depression Scale (Short Form)
Choose the best answer for you have felt over the past week

N0.	Questions	Answer with coding
1.	Are you basically satisfied with your life?	[**No=1**, Yes=0]
2.	Have you dropped many of your activities and interests?	[No=0, **Yes**=1]
3.	Do you feel that your life is empty?	[No=0, **Yes**=1]
4.	Do you often get bored?	[No=0, **Yes**=1]
5.	Are you in good spirits most of the time?	[**No=1**, Yes=0]
6.	Are you afraid that something bad is going to happen to you?	[No=0, **Yes**=1]
7.	Do you feel happy most of the time?	[**No=1**, Yes=0]

8.	Do you often feel helpless?	[No=0, **Yes**=1]
9.	Do you prefer to stay at home, rather than going out and doing new things?	[No=0, **Yes**=1]
10.	Do you feel you have more problems with memory than most?	[No=0, **Yes**=1]
11.	Do you think it is wonderful to be alive now?	[**No=1**, Yes=0]
12.	Do you feel pretty worthless the way you are now?	[No=0, **Yes**=1]
13.	Do you feel full of energy?	[**No=1**, Yes=0]
14.	Do you feel that your situation is hopeless?	[No=0, **Yes**=1]
15	Do you think that most people are better off than you are?	[No=0, **Yes**=1]
Total Score		**15**

Source: (Res, 1988; Sheikh and Yesavage, 1986; Yesavage, 1988).

Note that answers in **bold** indicate depression. Score 1 point for each bolded answer. A score> 5 points is suggestive of depression.

2.4. Computation of Geriatric Depression and its scaling

To calculate the GDS, at first, we have calculated the total of geriatric depression which as follows:

$$\text{GDS} = \text{sum of 15 depressive variables}$$

After the computation of geriatric depression, we used scaling as follows:

Table 2: Geriatric Depression Cut-points.

0-5	Normal or No depression
6-10	Mild or moderate Depression
10+	Severe Depression

Source: (Res, 1988; Sheikh and Yesavage, 1986; Yesavage, 1988).

To conduct this, the entire data management and statistical analyses were carried out using SPSS (IBM SPSS Statistics 20).

3. Results and Discussion

3.1. General characteristics

The GDS was administered to 944 participants. The mean age was 62.66 years (SD =8.95), with 54.3% male, 80% married and 67.2% never attended school i.e. illiterate. The respondents whose ages between 55 and 59 years constituted 46.5% (439) of the entire sample. While discussing the working situation, it was found that the majority of the older elderly did not have any job or monetary source, as in Bangladeshi culture maximum women (79%) were living as housewives. Although, joint family is breaking down in Bangladesh day by day with rapid urbanization but slightly more than fifty percent (56%) of the elderly in Sylhet still now found in joint or extended family systems. The majority of the respondents were non-smoker (74.3%) while urban participants smoking behavior is remarkable (59%). Muslims made up of 91.2% of the study sample, while 8.8% of the participants were Nom-Muslims (mainly Hindu). In relation to living arrangements, only 14% of the elderly were found to be live alone (Table 4).

3.2. Reliability

The internal consistency of the GDS-15 was examined by Cronbach alpha. Chronbach's coefficient alpha for the GDS-15 was 0.63 which was found to have an acceptable degree of internal consistency (Gliem & Gliem, 2003).

3.3. Prevalence of depression and its scores

The prevalence of depression among the participants was 52.5%; and the mean depression score was 6.18 (SD=2.85). Women had higher depression scores than men. Forty-three percent of the study population had mild or moderate depression and 9% had severe depression (Table 3).

Table 3: Distribution of elderly population on the basis of GDS-15 scores (N = 944)

Gender	Mean (SD)	Moderately depressed N (%)	Severely depressed N (%)	Total N (%)
Men	5.60 (2.58)	204 (39.8)	27 (5.3)	231 (45.1)
Women	6.87 (3.00)	204 (47.3)	61 (14.2)	265 (61.1)
Total	6.18 (2.85)	408 (43.2)	88 (9.3)	496 (52.5)

3.4. Bivariate association with depression

Bivariate associations of socio-demographic variables with depression have been described in Table 4. Depression was significantly ($p<0.0001$) associated with more aged, sex, education, occupation, marital status, smoking behavior, locality, and living alone. These findings support many other studies (Buvneshkumar, John & Logaraj, 2018; Das et al., 2014; Gao et al., 2009; Kavithai et al., 2019; Kim et al., 2002; Rahman, Uddin & Begum, 2018; Uddin, 2017) and (Al-Shammari & Al-Subaie, 1999).

Table 4: Association between socio-demographic variables with depression in elderly

Characteristics	Frequency	Normal	Mild to Moderate depression	Severe Depression	P-value (Chi-square)
	n (%)	n (%)	n (%)	n (%)	
Age					
55-59	439 (46.5)	244 (55.6)	161 (36.7)	34 (7.7)	0.000
60-64	180 (19.1)	81 (45.0)	85 (47.2)	14 (7.8)	
65-69	113 (12)	50 (44.2)	55 (48.7)	8 (7.1)	
70+	212 (22.5)	73 (34.4)	107 (50.5)	32 (15.1)	
Gender					
Male	513 (54.3)	282 (55.0)	204 (39.8)	27 (5.3)	0.000
Female	431 (45.7)	166 (38.5)	204 (47.3)	61 (14.2)	
Education					
Illiterate	634 (67.2)	266 (42.0)	294 (46.4)	74 (11.7)	0.000
Literate	310 (32.8)	182 (58.7)	114 (36.8)	14 (4.5)	
Occupation					
Service(Govt./private)	99 (10.5)	70 (70.7)	23 (23.2)	6 (6.1)	0.000
Business	100 (10.6)	61 (61.0)	36 (36.0)	3 (3.0)	
Housewife/Others	745 (78.9)	317 (42.6)	349 (46.8)	79 (10.6)	
Type of Family					
Nuclear	415 (44.0)	191 (46.0)	185 (44.6)	39 (9.4)	0.726
Joint/Extended	529 (56.0)	257 (48.6)	223 (42.2)	49 (9.3)	
Marital Status					
Married	759 (80.4)	397 (52.3)	320 (42.2)	42 (5.5)	0.000

Characteristics	Frequency	Normal	Mild to Moderate depression	Severe Depression	P-value (Chi-square)
	n (%)	n (%)	n (%)	n (%)	
Unmarried/Widowed/Divorced	185 (19.6)	51 (27.6)	88 (47.6)	46 (24.9)	
Smoking Behavior					
Non-Smoker	701 (74.3)	305 (43.5)	322 (45.9)	74 (10.6)	0.000
Smoker	243 (25.7)	143 (58.8)	86 (35.4)	14 (5.8)	
Religion					
Muslim	861 (91.2)	401 (46.6)	379 (44.0)	81 (9.4)	0.209
Non-Muslim	83 (8.8)	47 (56.6)	29 (34.9)	7 (8.4)	
Locality					
Urban	472 (50.0)	234 (49.6)	177 (37.5)	61 (12.9)	0.000
Rural	472 (50.0)	214 (45.3)	231 (48.9)	27 (5.7)	
Living Alone					
No	814 (86.2)	406 (49.9)	342 (42.0)	66 (8.1)	0.000
Yes	130 (13.8)	42 (32.3)	66 (50.8)	22 (16.9)	

3.5. Logistic regression analysis on depression with respect to socio-demographic factors

Binary logistic regression models have been performed to identify the influential socio-demographic risk factors of depression. In this model, GDS has taken as a binary dependent variable and the important socio-demographic factors as covariates. The results of logistic regression analyses are summarized in Table 5. Covariates associated with depression in bivariate analysis remain significant within the regression model for age, gender, marital status, religion, and occupation for the whole sample, although the association with the type of family members and living alone are also significant ($p = 0.075$ and 0.084). Logistic regression model revealed that age group 70 and above (adjusted odds ratio [AOR] =2.77), age groups 60-64 years (AOR =1.55), age groups 65-69 years (AOR =1.80), female elderly (AOR =1.63), those who were engaged in housewife or others (AOR =2.21) and Muslims elderly (AOR =1.73) were significantly ($p <0.05$) associated with elderly depression. The marital status of the elderly depicts a strong significant impact on geriatric depression. Those who were married had significantly less affected with depression (AOR=0.52, 95% CI 0.35-0.79, p =

0.002) than those who were spouseless (unmarried, widow/widower, divorced). Participants who had been living in their joint or extended family were less likely to depress (AOR=0.77, 95% CI 0.58-1.03, p =0.075) than those who had been living in their nuclear family. Those who were living alone had significantly more affected with depression (AOR=1.48, 95% CI 0.95-2.30, p =0.084) than those who were living with a spouse or others. The results of this study indicate that more aged, female seniors, unmarried or widowed or divorced seniors, those who were not engaged in any work, nuclear type family, Muslims, and those who were living alone were influential risk factors of geriatric depression.

Table 5: Binary logistic regression analysis of risk factors associated with depression in elderly

Characteristics	Unadjusted OR				Adjusted OR			
	OR	95% CI for OR		P value	OR	95% CI for OR		P value
		Lower	Upper			Lower	Upper	
Age								
55-59 (Ref.)								
60-64	1.529	1.079	2.168	0.017	1.552	1.069	2.253	0.021
65-69	1.577	1.040	2.391	0.032	1.799	1.149	2.818	0.010
70 and above	2.383	1.696	3.348	0.000	2.768	1.882	4.071	0.000
Gender								
Male (Ref.)								
Female	1.949	1.502	2.529	0.000	1.623	1.155	2.281	0.005
Education								
Illiterate (Ref.)								
Literate	0.508	0.386	0.670	0.000	0.863	0.603	1.159	0.283
Marital Status								
Unmarried/Widowed / Divorced (Ref.)								
Married	0.347	0.244	0.494	0.000	0.523	0.345	0.793	0.002
Occupation								
Service (govt./private) (Ref.)								
Business	1.543	0.855	2.786	0.150	1.846	0.995	3.425	0.052
Housewife/Others	3.259	2.064	5.145	0.000	2.208	1.332	3.660	0.002
Type of Family								
Nuclear (Ref.)								
Joint/extended	0.902	0.698	1.168	0.435	0.772	0.580	1.027	0.075

Religion								
Non-Muslim (Ref.)								
Muslim	1.498	0.951	2.359	0.081	1.725	1.037	2.871	0.036
Living Alone								
No (Ref.)								
Yes	2.085	1.408	3.087	0.000	1.477	0.949	2.297	0.084
Locality								
Rural (Ref.)								
Urban	0.844	0.653	1.089	0.193	1.077	0.801	1.447	0.623

4. Discussion

The present study observed that about 53% of the elderly individuals interviewed were at risk of depression. The previous results which were done in Community based studies in rural areas of Bangladesh the prevalence of depression were 84.3% in two southern districts of Bangladesh (Uddin, 2017), 60% in different villages of Dhamrai Upazila, Dhaka (Rahman, Rahman & Sajoni, 2015) and 59% in a rural community of Mirzapur, a sub-district under Tangail (Das et al., 2014) all using different GDS screening tools. Community-based studies done in India provide a prevalence ranging from 8.9% to 62.16% (Harinder et al., 2015; Manjubhashini, Krishnababu, & Krishnaveni, 2013; Seby, Chaudhury, & Chakraborty, 2019; Sengupta & Benjamin, 2015). The study conducted in ten European countries among the elderly aged ≥ 50 years reported a prevalence rate of depression as 18% to 37% (Castro-Costa et al., 2007). The wide variations can be largely explained by the usage of different study instruments, variations in study setting, sample sizes, or sampling strategies in different studies.

Depression may differ with individual's sex. For example in the present study, females were more depressed than males; studies also reported a high prevalence of depression among females (Anand, 2015; Das et al., 2014; Karim et al., 2006; MM, 2007; Munsur, 2010; Njrcm et al., 2017; Sati et al., 2013; Taqui et al., 2007). This can be due to a higher family burden or more responsibilities which can increase their mental stress (Naik & Nirgude, 2015). Also, women tend to be more sensitive to stressful situations in their life. Elderly females in higher age groups are more likely to report unhealthy than their counterparts. Females had consistently been associated with increased depression risk in later-life (Argyriadou et al., 2001; N, 2003), with the risk of late-life depression in females previously found to be twice than those of males (Birrer & Joseph, 2004). In

Europe, Copeland et al. (1999) also reported that females was a risk factor for late-life depression, and a meta-analysis of 20 studies further confirmed females as a risk factor for late-life depression (N, 2003).

Being unmarried or widowed or divorced was a significant factor in influencing depression. These findings are consistent with the results of previous studies (Sati et al., 2013; Taqui et al., 2007; Uddin, 2017) and inconsistent with another (Sengupta & Benjamin, 2015). Even a study comparing depression among different parts of European countries found that unmarried, widowed, or divorced adults have reported more symptoms of depression than married adults (Copeland et al., 2004).

Housewife/others who are not engaged in any work are more likely to suffer from geriatric depression than adults who are engaged in work or service. Not smokers, seniors are more depressed than smokers. Non-Muslim are less depressed than Muslim elders. This finding is consistent with the results of previous study (Uddin, 2017). There was a significant reason for the depression of those living alone. The previous studies (Rahman et al., 2015; Sengupta & Benjamin, 2015) also found that those who lived alone were more likely to suffer from depression and were inconsistent with another (Uddin, 2017).

Those who lived in nuclear families were more at risk of depression. This can be explained by the support offered by relatives by sharing responsibilities on many issues. It gives greater economic and social security to the elderly. The role of the type of family in depression was well established by previous works (Harinder et al., 2015; Patil and Kulkarni, 2016; Seby, Chaudhury, & Chakraborty, 2011). The current study supports this statement.

Rural seniors are more prone to depress because of family discrimination, financial crisis, or physical and mental disability for responsibility (Karel, 1997). In this study, it is found that rural elders were more depressed than urban dwellers.

Our results indicate that depression, particularly mild, is common in the Sylhet district of Bangladesh. It is difficult to compare these rates defined using GDS with other studies that use different assessments from Europe to the United States (Blazer, 2003). The prevalence of mild depression in our study (43.2%) is almost the same in previous study conducted by Jui Das et al., (2014). The finding that mild depression is much more common than severe depression is consistent with the findings of most other studies (Chen, Chong, & Tsang, 2007; Papadopoulos et al., 2005).

5. Conclusion

In this study, we tried to observe the prevalence of depression and identify the socio-demographic risk factors associated with depression in the elderly. The findings broadly suggest that just over half of the elderly reported having depression. Significant factors affecting depression were identified as being more aged, being a woman, being unmarried/widowed/divorced, being involved with a housewife/others, smoking, being a Muslim, living in a nuclear family, and living alone. The findings of this study confirm that the oldest elderly (aged 70 or above) were at higher risk of depression. Our results also indicate that mild depression is common in Sylhet district of Bangladesh. It indicates that depression is becoming a silent killer and is taking the shape of an epidemic and compromising the quality of life of the elderly. Thus, special care should be taken to address their medical needs, provide them with nutritious food and various recreational activities and improve their quality of life by improving their family relationship. Authorities should take steps to involve the elderly in paid or voluntary activities. These results can have a significant impact on policy implications; particularly for the well-being of depressed people which includes social mobilization, early diagnosis, and prompt treatment. A comprehensive plan of action should be made through the joint efforts of the health care department, social welfare department, government, and nongovernment sector working in the field of senior citizens to perk up in geriatric health especially in the domain of mental health.

List of Abbreviations

GDS = Geriatric depression scale

SD= Standard deviation

SES= Socio-economic Status

WHO = World Health Organization

ADL = Activities of daily living

SRS = Simple random sampling

AOR = Adjusted odds ratio

Limitation of the study: There are a number of limitations to this study. Most importantly, the analyses reported here are based on cross-sectional associations, thus not suggesting any directional causation on the significant relationship.

Second, the geriatric depression scale is a tool used for screening purposes hence there is a need for further clinical examination and investigation of those elderly who were in mild or severe depression.

Relevance of the study: The study can provide baseline data for researchers for further investigation.

Future scope of the study: It is recommended that a national representative study is carried out to portrait the actual figure of geriatric depression in Bangladesh.

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