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Prevalence of Depression among Geriatric Population Attending Primary Healthcare Settings in Al-Madinah

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Abstract

Introduction: The prevalence of depression is higher among geriatric population compared to general population. Depression is associated with several adverse health outcomes including reduced quality of life, functional decline, increased health cost and increased mortality. to estimate rate and determinants of depression among elderly population (aged 60 years or more) in Al Madinah city, Kingdom Saudi Arabia

Methods: A descriptive cross-sectional study was carried out among elderly patients (aged over 60 years) attending the primary healthcare centers inside AL-Medinah city, Saudi Arabia during the period (June-December, 2021). A self-administered questionnaire was utilized for data collection. It included four main sections; Personal and socio-demographic characteristics, lifestyle habits, clinical data and Arabic version of Geriatric Depressive Scale- Short form (GDS-SF).

Results: The study included 360 elderly patients. They equally distributed between males and females. Their age ranged between 61 and 88 years with a mean±SD of 70.8±4.7 years. Majority of the participated geriatric patients (96.7%) were depressed; mostly of mild (54.4%) and moderate degrees (38.9%). Severe depression was observed among only 3.3% of the participants. Multivariate logistic regression analysis revealed that the only two significant factors for moderate/severe depression were participants` marital status and history of diabetes. Widowed persons were at almost triple risk for moderate/severe depression compared to married persons (Adjusted odds ratio "AOR"=2.82; 95% confidence interval "CI"=1.32-6.01), p=0.008. Diabetic patients were more likely to develop moderate/severe depression compared to those without diabetes (AOR=2.40, 95% CI=1.52-3.77), p<0.001.

Conclusions: Depression is a very prevalent health problem affecting geriatric patients attending primary healthcare centers in Al-Madinah. However, most of cases are of mild or moderate severity.

Keywords: Geriatric, Depression, Prevalence, Risk factors, Saudi

Introduction

According to the World Health Organization (WHO), nearly 15% of elderly population aged over 60 years and over having neuropsychiatric disorders; commonly dementia and depression [1]. Depression in elderlyis characterized by "feeling of grief and sadness in response to life events and contextual conditions such as retirement, bereavement, loss of income, disabilities affecting physical, social and cognitive functions" [2]. The prevalence of depression is higher among geriatric population compared to general population, it ranged between 5.9 and 81% particularly among hospitalized patients.3It is often misdiagnosed and under treated [3-4].

It was reported in several studies that depressive symptoms significantly associated with medical conditions and co-morbidities including diabetes, dementia, stroke, heart disease and osteoporosis [5-7]. Depression can recurrent or chronic problem and affects the implementation of everyday responsibilities [8]. Depression is associated with several adverse health outcomes including reduced quality of life, functional decline [9], increased health cost [10], and increased mortality [11]. In addition, depression can cause suicide, which leads for about 850 000 deaths yearly [12]. To the best knowledge of researcher there are limited studies have been conducted on depression among elderly population in Saudi Arabia.

Depression is a common underestimated psychological problem among elderly people and influences their well-being and quality of life. Many gaps in our understanding and diagnosis of late-life depression exist which lead to increase healthcare costs and resources. Moreover, the profile of geriatric depression in Al Madinah is not identified in previous studies up to our knowledge. Hence, the present study was conducted to investigate the prevalence of depressions and its associated factors among elderly population in Al-Madinah. Conduction of the study at primary healthcare centers could reflect the important role of primary health care physician toward elderly depression in order to provide optimal health services. This study aimed to investigate the problem depression among elderly population (aged 60 years or more) in Al Madinah city, Kingdom Saudi Arabia and set recommendations to improve the situation.

Methods

This is a descriptive cross-sectional study that was carried out in AL-Medina, which located in the West of Saudi Arabia. AL-Medina includes 147 primary healthcare centers (PHCs); 53 inside the city and 94 outside it. This study was carried out in PHCs inside AL-Medina city. All elderly patients (>60 years old) who attended the primary healthcare centers in AL-Medina city, were included. The sample size was computed utilizing the statistical formula for a cross-sectional survey. An estimated prevalence of geriatric depression was 63.7% (~0.64) based on a previous study carried out among elderly population attending PHC centers in Abha city, Saudi Arabia [13]. Giving a sample of 354 elderly patients with ~10% was added to the total sample size for the non-respondents. Thus, a total of 390 participants were invited to participate in the study.

Multi-stage random sampling technique was adopted. In the first stage, two geographical regions from AL-Medina city were selected out of the four (East, West, North and South). In the second stage, 2 primary healthcare centers were selected from each region by simple random technique. In the last stage, about 100 elderly patients attending these PHCCs during the period of data collection were selected by systematic random technique according to number of patients visiting each center daily. They were equally distributed between male and female elderly persons.

A self-administered questionnaire was utilized for data collection. It included four main sections; Personal and socio-demographic characteristics including age in years, gender, highest educational level, marital status, monthly income and residence. Lifestyle habits including smoking or not, practicing physical exercise. Clinical data including the history of co-morbidity e.g. DM, hypertension, cardiac disease, respiratory diseases, renal diseases, cancer, joint pain, paralysis, hearing impairment and vision impairment, using moving aid.

Arabic version of Geriatric Depressive Scale- Short form (GDS-SF). Arabic version of GDS is freely available and validated by ChaayaM et al. The sensitivity and specificity were 88% and 85%, respectively [14-15]. Internal consistency was assessed by Cronbach's alpha coefficient (0.88) [14]. The GDS-SF is a 15-item self-directed questionnaire requiring "yes" or "no" answers and total score was computed and categorized into no depression, mild depression, moderate depression and severe depression.

Data entry and analysis were carried out using SPSS (Statistical Package for Social Sciences), version 26. Descriptive statistics was done using frequency and percentage for categorical variables and mean, range and standard deviation (SD) for continuous numerical variables. Analytical statistics was performed using chi-square test to investigate the association between degree of geriatric depression and its possible associated categorical variables and one-way analysis of variance (ANOVA) test to compare means of a continuous variable between more than two different groups. Multivariate logistic regression analysis was done by considering those with no depression and mild depression as one category against those with moderated or severe depression. P-value < 0.05 was considered for significance

Written permission from Joint Program of Family Medicine in AL-Medina AL-Monawarah was obtained before conducting the research. In addition, written permission from the director of the primary care, MOH in AL-Medina AL-Monawarah was obtained as well as permission of all involved PHCCs directors were requested verbally. Before giving questionnaires to participants, informed consent was asked from all of the chosen subjects then, all of them had the right not to participate in the study or to withdraw from the study prior to completion. The researcher explained the purpose of the study to all respondents. Confidentiality and privacy were guaranteed for all participants.

Results

The study included 360 elderly patients. Their personal and sociodemographic characteristics are presented in Table 1. They equally distributed between males and females. Their age ranged between 61 and 88 years with a mean±SD of 70.8±4.7 years. Most of them (77.2%) were Saudi nationals and married (78.4%). More than half of them (56.7%) had high school degree and majority (93.3%) were notworking. The monthly income of 57.5% of them was less than 5000 Saudi Riyals. Majority of them (89.4%) live in cities. About 21% of the participants reported

Table 1: Personal and sociodemographic characteristics of the participants

Variables	*Frequency*	*Percentage*
Sex		
Male	180	50.0
Female	180	50.0
Age (years)		
Range	61-88	
Mean±SD	70.8±4.7	
Nationality		
Saudi	278	77.2
Non-Saudi	82	22.8
Marital status		
Married	282	78.4
Divorced	26	7.2
Widowed	34	9.4
Single	18	5.0
Educational level		
Illiterate	8	2.2
Elementary school	90	25.0
High school	204	56.7
Bachelor	58	16.1
Job status		
Not working	336	93.3
Working	24	6.7
Income (Saudi Riyals/month)	207	57.5
<5000	99	27.5
5000-10000	31	8.6
10001-15000	23	6.4
>15000		
Place of current residence	322	89.4
City	38	10.6
Village		

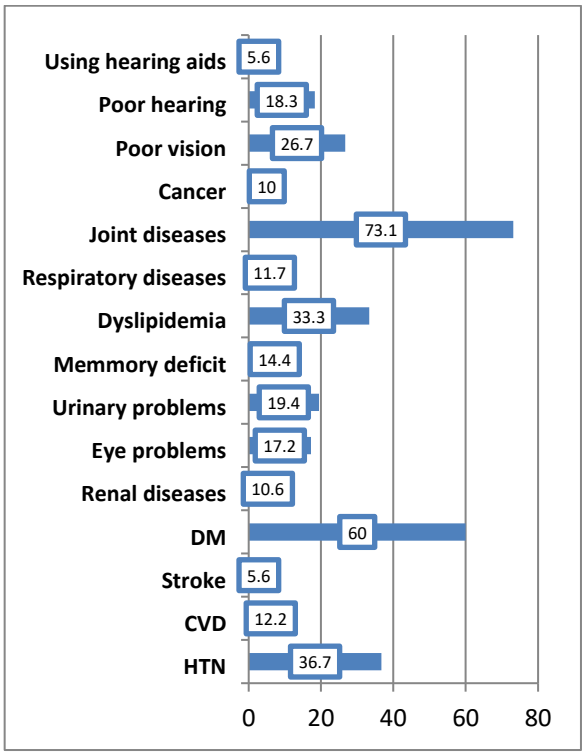

Figure 1: History of chronic health problems among the participants

practicing regular physical exercise. As regards smoking status, the prevalence of current smoking was 30.3% whereas that of ex-smoking was 12.2%.

The most frequently reported health problem among the participants was musculoskeletal and joint pain as it was reported by most of them (73.1%), followed by diabetes mellitus (60%), then hypertension (36.7%), dyslipidemia (33.3%), poor vision (26.7%) and urinary problems. The majority of the participated geriatric patients (96.7%) were depressed; mostly of mild (54.4%) and moderate degrees (38.9%). Severe depression was observed among only 3.3% of the participants (figure 1).

The age of geriatric patients was highest among a group without depression and lowest among those with severe depression (74±8.3 and 69±2.3 years, respectively), p=0.015. Severe depression was more observed among non-Saudi compared to Saudi nationals (8.5% vs. 1.8%), p=0.028. Widowed persons were more likely to have severe depression compared to other categories (11.8% versus 0-2.8%), p=0.006. A quarter of illiterates compared to none of Bachelor holder had severe depression, p=0.027. Severe depression was more reported among working compared to non-working persons (16.7% vs. 2.4%), p=0.002. Participants` sex, income and place of residence were not significantly associated with depression as demonstrated in table 2.

Less than half (45%) of current smokers compared to 35.7% of non-smokers had moderate depression whereas 5.8% of none smokers compared to none of current smokers had severe depression, p=0.048. History of regular practicing physical exercise was not significantly associated with depression and its severity (table 3).

Elderly patients with history of stroke were more likely to develop severe depression compared to their peers (20% vs. 2.4%), p<0.001. Similarly, those with diabetes or renal diseases were more likely to have severe depression compared to those without these diseases (5.1% and 7.9% vs. 0.7% and 2.8%, respectively), p=0.001 and 0.016, respectively. Elderly patients with memory deficits were more likely to develop severe depression compared to their counterparts (11.5% vs. 1.9%), p=0.005. Severe depression was more observed among patients with cancer than their peers (11.1% vs. 2.5%), p=0.033. Elderly patients with poor vision were more likely to develop severe depression compared to their peers (9.4% vs. 1.1%), p=0.001. Hypertension, cardiovascular diseases, eye problems, urinary problems, dyslipidemia, respiratory diseases, joint pain, poor hearing and using hearing aids were not significantly associated with severity of depression (table 4).

Multivariate logistic regression analysis by considering elderly persons with no or mild depression against those with moderate or severe depression revealed that the only two significant factors for moderate/severe depression were participants` marital status and history of diabetes. Widowed persons were at almost triple risk for moderate/severe depression compared to married persons (Adjusted odds ratio "AOR"=2.82; 95% confidence interval "CI"=1.32-6.01), p=0.008. Diabetic patients were more likely to

develop moderate/severe depression compared to those without diabetes (AOR=2.40, 95% CI=1.52-3.77), p<0.001. Patients` age, nationality, educational level, job status, smoking, histories of stroke, renal diseases, memory deficits, cancer and poor vision were not significantly associated with moderate/severe depression after controlling for the confounding effect (table 5).

Discussion

Worldwide and Saudi Arabia is not an exception, mental problems, particularly depression are common health problems among geriatric people [16-17]. In accordance with that, the present study revealed a very high prevalence rate of depression among geriatric patients attending primary healthcare centers in AL-Medina AL-Monawarah city reaching 96.7%; however, it was mostly of mild (54.4%) and moderate degrees (38.9%). Severe depression was observed among only 3.3% of the participants.

Various rates have been reported for depression among geriatric people elsewhere depending on the tool used in investigating depression as well as the demographic characteristics of the studied population. In Arab countries such as Jordan, according to PHQ-9, 17% and 10.5% of the hospitalized patients were diagnosed with a major depressive disorder and other depressive disorders, respectively and the DSM-5 criteria identified 12% of elderly with major depression. 13 In Iraq, the rate was 38.9% [18]. A study from Oman reported depression prevalence of 16.9% with more prevalence among females than males (19.3% Vs 14.3%). Previous study from Abha (Saudi Arabia) reported that the prevalence of depression among elder individuals was 63.7% in primary health care centers; mild and moderate depression was reported by 47.5% and 14.5% of elderly patients respectively while severe depression was reported by only 1.8% of them. In India, the prevalence was 50.9%; Mild form was observed among 26.2% whereas major form was observed among 24.7% of them. In another study has been conducted in India, the prevalence of depression was 29.4%. The estimated Indian pooled prevalence of depression in elderly was 34.4%. A recent systematic review and meta-analysis revealed an estimated prevalence of depressive symptoms among geriatric population in China of 20.0% [19]. Also, in China, (2018), the prevalence of depressive symptoms was 32.8% [20]. In Vitnam, a rate of 66.9% of self-reported depression was reported. It was mild, moderate and severe among 32.8%, 30.4% and 3.7% of them, respectively [21]. In South Africa, the prevalence of depression was 40% [22]. In Malaysia (2019), the prevalence of depression was 19.3% [23]. Also, in Malaysia (2016), the prevalence of depressive symptoms was 16.5% among community-dwelling older adults [24].

No gender difference was reported in the current study regarding the prevalence of depression among elderly patients, in agreement with others [21]. However, female predominance was observed by others.

Among studied sociodemographic risk factors for depression, the present study revealed in univariate analysis an association between depression and relatively younger age, non-Saudi nationality, widowed status, illiteracy and working conditions. However, in multivariate analysis, after controlling for confounders, only marital status was the significant risk factor as widowed were more likely to have moderate/severe depression than married persons. In Jeddah, depression was associated with unmarried status, and lower income [13]. In Abha city, also singles or divorced were at higher significant risk for depression [14]. In south Africa in accordance with our finding, widow status was a significant risk factor for depression whereas marriage was a protective factor [22]. In India, significant sociodemographic determinants for depression were marital status, economic dependency, unemployed status, and lack of regular physical exercise.in another Indian study, univariate analysis revealed that age, educational level, job status, marital status, family type, and financial dependency were significant predictors for depression. However, in multivariate analysis, only age was proved to a significant predictor for depression. In Malaysia, less educated individuals were more likely to have depression [24].

In the present study, depression, in univariate analysis, was associated with some chronic health problems

such as stroke, diabetes, renal diseases, memory deficits, cancer and poor vision. However, after controlling for the confounding effect in multivariate logistic regression analysis, only diabetes remained as a risk factor for depression among geriatric people. In Jeddah, depression was associated with cardiovascular disease and cancer among hospitalized elderly [13]. In Abha, significant predictors for depression among elderly patients were diabetics, cancer patients, osteoarthritis patients, patients with end-stage renal disease, hepatic patients and those having visual impairment. In Omani study, depression was predicted by the presence of dementia, joint problems, mobility restrictions and impairment in the activity of daily living. In Malaysia, depression was associated with cognitive impairment, and marked dependence [23]. In another study carried out in Malaysia, patients having neurotic disorder, having a lower score of instrumental activities of daily living, poor physical fitness level, having hypertension, and osteoarthritis were more likely to be depressed [24]. In India, health status and limitation of daily activities were significant predictors for depression. In China, multivariate analysis showed impaired cognitive functions, disturbed family function and frailty and prolonged hospital length were the significant predictors for depression [21]. The mechanism associating depression to chronic health problems, particularly diabetes is not fully understood, but most likely to include several pathways such as restricted dietary habits, impaired behavioral adaptation, and greater susceptibility to complications [25]. Further work is warranted to explore these biological and behavioral pathways in geriatric patients.

Limitations of the present study including conduction of the study among geriatric patients attending primary healthcare centers, rather than the general population which impacts the generalizability of results. Also, depending on geriatric depression scale in diagnosing depression, rather than clinical diagnosing depression, which might causes overestimation of depression as clear in our findings. The cross-sectional study design is among possible limitations of the study as it generates information related to associated factors, but not related to causative factors. Finally, the study was done at a single city, and thus the result might be not generalized to other cities in the Kingdom of Saudi Arabia. Despite of those limitations, it added to the literature as this subject is limited investigated in Saudi Arabia, although important as a result of aging caused by development in the Kingdom.

Conclusions

Depression is a very prevalent health problem affecting geriatric patients attending primary healthcare centers in Al-Madinah. However, most of cases are of mild or moderate severity. Widowed as well as diabetic persons were more likely to have depression than others. Based on these findings, periodic screening for depression among geriatric patients is indicated for early discovery and stating adequate management.

Conflict of interests

The authors declared no conflict of interests.

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Table 2: Participants` personal and sociodemographic factors associated with geriatric depression.

	Geriatric depression				*p-value*
	Absent	**Mild**	**Moderate**	**Severe**	
Sex					
Male (n=180)	7 (3.9)	96 (53.3)	71 (39.4)	6 (3.3)	
Female (n=180)	5 (2.8)	100 (55.6)	69(38.3)	6 (3.3)	0.931*
Age (years)					
Mean±SD	74±8.3	70.4±4.4	71.3±4.6	69±2.3	0.015**
Nationality					
Saudi (n=278)	9 (3.2)	155 (55.8)	109 (39.2)	5 (1.8)	
Non-Saudi (n=82)	3 (3.7)	41 (50.0)	31 (37.8)	7 (8.5)	0.028*
Marital status					
Married (n=282)	10 (3.5)	160 (56.7)	104 (36.9)	8 (2.8)	
Divorced (n=26)	0 (0.0)	18 (69.2)	8 (30.8)	0 (0.0)	
Widowed (n=34)	0 (0.0)	12 (35.3)	18 (52.9)	4 (11.8)	
Single (n=18)	2 (11.1)	6 (33.3)	10 (55.6)	0 (0.0)	0.006*
Educational level					
Illiterate (n=8)	0 (0.0)	4 (50.0)	2 (25.0)	2 (25.0)	
Elementary school (n=90)	2 (2.2)	51 (56.7)	33 (36.7)	4 (4.4)	
High school (n=204)	10 (4.9)	107 (52.5)	81 (39.7)	6 (2.9)	
Bachelor (n=58)	0 (0.0)	34 (58.6)	24 (41.4)	0 (0.0)	0.027*
Job status					
Not working (n=336)	12 (3.6)	186 (55.4)	130 (38.7)	8 (2.4)	
Working (n=24)	0 (0.0)	10 (41.7)	10 (41.7)	4 (16.7)	0.002*
Income (Saudi Riyals/month)					
<5000 (n=207)	8 (3.9)	115 (55.6)	76 (36.7)	8 (3.9)	
5000-10000 (n=99)	3 (3.0)	50 (50.5)	45 (45.5)	1 (1.0)	
10001-15000 (n=31)	1 (3.2)	19 (61.3)	10 (32.3)	1 (3.2)	
>15000 (n=23)	0 (0.0)	12 (52.2)	9 (39.1)	2 (8.7)	0.632*
Place of current residence					
City (n=322)	12 (3.7)	174 (54.0)	124 (38.5)	12 (3.7)	
Village (n=38)	0 (0.0)	22 (57.9)	16 (42.1)	0 (0.0)	0.386*

Table 3: Participants` habitual factors associated with geriatric depression.

Factors	***Geriatric depression***				***p-value****
	Absent	**Mild**	**Moderate**	**Severe**	
	N=12	**N=196**	**N=140**	**N =12**	
	N (%)	**N (%)**	**N (%)**	**N (%)**	
Regular practicing physical exercise					
No (n=283)	8 (2.8)	151 (53.4)	112 (39.6)	12 (4.2)	
Yes (n=77)	4 (5.2)	45 (58.4)	28 (36.4)	0 (0.0)	0.193
Smoking					
No (n=207)	8 (3.9)	113 (54.6)	74 (35.7)	12 (5.8)	
Current smoker (n=109)	4 (3.7)	56 (51.4)	49 (45.0)	0 (0.0)	
Ex-smoker (n=44)	0 (0.0)	27 (61.4)	17 (38.6)	0 (0.0)	0.048*

***Chi-square test**

Table 4: Participants` medical factors associated with geriatric depression

Factors	*Geriatric depression*				*p-value*
	Absent N=12 N (%)	**Mild N=196 N (%)**	**Moderate N=140 N (%)**	**Severe N =12 N (%)**	
Hypertension					
No (n=228)	7 (3.1)	126 (55.3)	90 (39.5)	5 (2.2)	
Yes (n=132)	5 (3.8)	70 (53.0)	50 (37.9)	7 (5.3)	0.443
Cardiovascular diseases					
No (n=316)					
Yes (n=44)	12 (3.8)	170 (53.8)	126 (39.9)	8 (2.5)	
	0 (0.0)	26 (59.1)	14 (31.8)	4 (9.1)	0.058
Stroke					
No (n=340)	12 (3.5)	184 (54.1)	136 (40.0)	8 (2.4)	
Yes (n=20)	0 (0.0)	12 (60.0)	4 (20.0)	4 (20.0)	<0.001
Diabetes mellitus					
No (n=144)	7 (4.9)	94 (65.3)	42 (29.2)	1 (0.7)	
Yes (n=216)	5 (2.3)	102 (47.2)	98 (45.4)	11 (5.1)	0.001
Renal diseases					
No (n=322)	8 (2.5)	176 (54.7)	129 (40.1)	9 (2.8)	
Yes (n=38)	4 (10.5)	20 (52.6)	11 (28.9)	3 (7.9)	0.016
Eye problems					
No (n=298)	11 (3.7)	162 (54.4)	118 (39.6)	7 (2.3)	
Yes (n=62)	1 (1.6)	34 (54.8)	22 (35.5)	5 (8.1)	0.116
Urinary problems					
No (n=290)	8 (2.8)	153 (52.8)	121 (41.7)	8 (2.8)	
Yes (n=70)	4 (5.7)	43 (61.4)	19 (27.1)	4 (5.7)	0.078
Memory deficit					
No (n=308)	10 (3.2)	169 (54.9)	123 (39.9)	6 (1.9)	
Yes (n=52)	2 (3.8)	27 (51.9)	17 (32.7)	6 (11.5)	0.005
Dyslipidemia					
No (n=240)	9 (3.8)	123 (51.2)	100 (41.7)	8 (3.3)	
Yes (n=120)	3 (2.5)	73 (60.8)	40 (33.3)	4 (3.3)	0.369
Respiratory diseases					
No (n=318)	10 (3.1)	170 (53.5)	128 (40.3)	10 (3.1)	
Yes (n=42)	2 (4.8)	26 (61.9)	12 (28.6)	2 (4.8)	0.499
Joint pain					
No (n=97)	3 (3.1)	62 (63.9)	30 (30.9)	2 (2.1)	
Yes (n=263)	9 (3.4)	134 (51.0)	110 (41.8)	10 (3.8)	0.170
Cancer					
No (n=324)	12 (3.7)	178 (54.9)	126 (38.9)	8 (2.5)	
Yes (n=36)	0 (0.0)	18 (50.0)	14 (38.9)	4 (11.1)	0.033
Poor vision					
No (n=264)	11 (4.2)	143 (54.2)	107 (40.5)	3 (1.1)	
Yes (n=96)	1 (1.0)	53 (55.2)	33 (34.4)	9 (9.4)	0.001
Poor hearing					
No (n=293)	12 (4.1)	165 (56.3)	106 (36.2)	10 (34.0)	
Yes (n=67)	0 (0.0)	31 (46.3)	34 (50.7)	2 (3.0)	0.080
Using hearing aids					
No (n=340)	12 (3.5)	184 (54.1)	132 (38.8)	12 (3.5)	
Yes (n=20)	0 (0.0)	12 (60.0)	8 (40.0)	0 (0.0)	0.673

Table 5: Multivariate logistic regression analysis for predictors of moderate/severe depression among geriatric patients

	B	*Standard error*	*Adjusted OR (95% CI)*	*p-value*
Marital status				
Married (n=282)			1.0	---
Divorced (n=26)	-0.279	0.452	0.76 (0.31-1.83)	0.537
Widowed (n=34)	1.035	0.387	2.82 (1.32-6.01)	0.008
Single (n=18)	0.718	0.502	2.05 (0.77-5.48)	0.152
Diabetes mellitus				
No (n=144)				
Yes (n=216)			0.1	
	0.874	0.231	2.40 (1.52-3.77)	<0.001

B: Slop

OR: Odds ratio

CI: Confidence interval