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Severity of Depression among Elderly Women Attending Holy Quran Memorization Centers in Saudi Arabia

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Abstract

Background: Depression is the most common mental health problem among the elderly, causing considerable morbidity worldwide, as well as increased healthcare costs. The purpose of this study was to determine the severity of depression among Saudi elderly women attending Quran Memorization Centers in the Kingdom of Saudi Arabia.

Methods: We recruited 340 participants aged 65 years and older from 11 Quran Memorization Centers in the cities of Dammam, Khobar and Dhahran in the Eastern Province of Saudi Arabia. We used a structured interview questionnaire composed of socio-demographic characteristics and the Activity of Daily Living instrument to assess participants' physical, social, and health-status conditions. In addition, we used the English version of the Geriatric Depression Scale and the Arabic version of Montreal Cognitive Assessment as the main screening instruments for depression and cognitive impairment respectively.

Results: Severity of depression among all participants was 42.1%. Low monthly income, the absence of a caregiver, diabetes, disability, and sleep disturbance were identified as common factors associated with depression.

Conclusion: The present study showed that depression in elderly females attending these centers was high and associated with multiple medical and socioeconomic characteristics, which is a cause of concern.

Keywords: Depression; Elderly; Female; Risk factors; Saudi Arabia

Introduction

Population aging is on the rise around the globe due to consistent improvements in socio-economic and healthcare systems [1,2]. The most accepted definition of the age group characterized as elderly is a person aged 65 years and older [3]. It is the fastest growing age group worldwide as a result of both increased life expectancy and a dramatic decline in fertility rates [4]. By 2050, the number of elderly persons is projected to increase from the current 6.9% to 16.4% [5]. For example, in Kingdom of Saudi Arabia (KSA), the elderly population increased from 3.48% in 1993 to 6.7% in 2004. This increase is a result of improved healthcare and socioeconomic standards [1].

Although population health generally improved, the increased life expectancy has brought about increased numbers of certain mental illnesses, such as depression. Depression is a widespread, disabling disorder in the elderly and is characterized by feelings of sadness and grief in response to contextual conditions and life events, such as bereavement, retirement, loss of income, transition from independent living to assisted or residential care, and disabilities that affect physical, social, and cognitive functions [2-6]. The diagnosis of depression as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) is described by the presence of five or more of the following symptoms: depressed mood, sleep disturbance, lack of interest or pleasure in activities, feelings of guilt or worthlessness, lack of energy, loss of concentration and difficulty making decisions, weight loss, psychomotor agitation or retardation, and suicidal ideation [7].

Literature regarding the prevalence of depression in the elderly is inconsistent. The reported prevalence worldwide ranged from 10% to 15%, with the highest level reported to be 45% (4,8). In developed countries, the prevalence of depression in the elderly ranged from 0.9% to 9.4% in private households and from 14% to 42% in institutional settings [8]. As for developing countries, such as Arab countries, elderly community-based studies reported a depression rate of 24.3% in Jordan [9], 25% in Kuwait [10], and 38.9% in Iraq [11]. A Saudi national survey showed a lower rate of 17.5% [12,13]. In cognitively impaired persons, the severity of depression varied from 50% to 70% and was linked to increased medical mobility and mortality in the elderly [12,14]. In both developed and developing countries, depression was reported to be more common among women than men [13,15].

Studies on risk factors showed that bereavement, sleep disturbance, disability, prior history of depression, and female gender are strongly associated with depression in the elderly [16]. Another survey showed that the main predictors of depression were female gender, somatic illness, cognitive and functional impairment, loss of close social contacts, and prior history of depression [8]. Alshammari and Al-Subaie [13] reported depression as a contributing risk factor in complicating diagnosis and health management in the Saudi elderly. A

subsequent study by Katona and Shankar (2004) reported similar results [17].

Saudi Arabia is a rapidly growing country with modern changes that have influenced a more social and urbanized lifestyle for people and created consequences for the elderly [18,19]. A few community studies have assessed health issues faced by the Saudi elderly [12,13]. Hence, the present study was conducted to determine the severity of depression among Saudi elderly women frequently attending Quran Memorization Centers (QMCs) in the Eastern Province (EP) of KSA and to assess the risk factors associated with their overall health status.

Methods

In this cross-sectional study, we recruited a sample of elderly women aged 65 years and older from QMCs in the three urban cities of Dammam, Khobar, and Dhahran in the EP of Saudi Arabia during the period from 2011 to 2012. In view of the limited options for entertainment, QMCs remained to be popular recreational activities for elderly. We randomly selected our participants from the eleven centers as follows: 231(67.2%) participants from five centers in Dammam, 85 (24.7%) participants from four centers in Khobar, and 25 (7.3%) participants from two centers in Dhahran. We excluded elderly who were less than 65 years, non-Saudis, not regularly attending QMCs and had difficulty communicating or refused to participate in the study. Among 344 targeted samples, 340 participants agreed to fill out a structured questionnaire to assess their physical, social, and health-status conditions. The questionnaire was translated into simple Arabic by the method of back-translation. Permission to carry out the study was obtained from the authorities of each center. Ethical approval for the study was obtained from the Department of Family and Community Medicine (FAMCO), University of Dammam. After the objectives of the study were explained, the participants gave verbal consent to participate when written informed consent could not be obtained. Confidentiality and the right to withdraw were also explained. The interviews were conducted by the senior author, who had previous training in interviewing the elderly and was well aware of the conservative nature of Saudi society. Because the majority of the participants lacked formal education, the interviewer was available to provide assistance and supervision.

The structured questionnaire also included information on the Activity of Daily Living (ADL) and socio-demographic variables. The socio-demographic information covered four characteristics: age, residence, marital status, and education. The Arabic version of the ADL was employed to assess daily activities in elderly nursing-home residents and to assist caregivers or healthcare practitioners in prescribing appropriate physical exercise for Arabic-speaking elderly. The instrument assesses overall functional activity in bathing, dressing, going to the toilet, transforming, continence, and feeding [20].

We also used the Geriatric Depression Scale (GDS) and the Montreal Cognitive Assessment (MoCA) to assess depressive symptoms and cognitive impairment respectively. The GDS was first developed by Yesavage et al. [21] to screen for depression in older persons. It is a brief questionnaire in which participants are asked to respond to questions in reference to how they felt on the day of administration. Scores of 0 to 9 are considered normal, 10 to 19 indicate mild depression, and 20 to 30 indicate severe depression. The GDS was found to have 92% sensitivity and 89% specificity when evaluating major depression. The reported reliability in a pilot study was 86% [6]. The Arabic version of MoCA is a brief screening instrument for dementia and mild cognitive impairment (MCI) in the elderly [22]. It was found to have 92.3% sensitivity, 85.7% specificity, and a reliability of 83%. Participants are categorized as normal in the cognitive assessment when their MoCA scores are 90 or more. A score of 89 to 78 indicated the presence of MCI, and a score below 78 was categorized as dementia.

After data collection, all variables were checked for accuracy, coded, entered into a personal computer, and analyzed by using the Statistical Package for Social Sciences 16.0 (SPSS). Univariate comparison of variables was done between the depressed and non-depressed elderly. The Chi square test was performed for categorical variables. Multiple logistic regression analysis was carried out to determine which factors were independent predictors of depression among the elderly. The significant level used was $p<0.05$ to determine the association between depression and each factor tested.

Results

Out of a total of 344 elderly citizens, 340 participants were interviewed, giving a response rate of 98.8%. All participants were unemployed Saudi women; with mean age of 68.69 years (SD 3.96) ranging 65-83years. One hundred forty three (n=340; 42.1%) participants reported to have been depressed.

Table 1 shows the socio-demographic characteristics of participants, who were predominantly widowed (56%), living in urban areas (98.8%), lacking formal education (83.2%), and 65 to 74 years of age (89.1%). The found depression in our sample was 42.1%. Among the 143 who had geriatric depression, 134 (39.4%) had mild depressive symptoms, whereas only 9 (2.6%) had moderate to severe depressive symptoms.

Characteristics	Numbers	Percent
Age range (years)		
65-74	303	89.1
75-84	37	10.9
Residence		
Urban	336	98.8
Rural	4	1.2
Marital status		
Married	131	38.5
Divorced	13	3.8
Widowed	192	56.5
(Single +separated)	4	1.2
Education		
informal*	283	83.2
Official+	57	16.8
* Informal (no read & no write + read &write)		

+ Official (primary, secondary, high school, or diploma and university and more)

Table 1: Socio-demographic characteristics of elderly female participants (N=340)

Table 2 shows the association between depression and health status characteristics, which demonstrates that 276 (81.2%) of participants had chronic illnesses. Of these, 148 (43.5%) received 5 or more drugs, 113 (33.2%) received 3 to 4 drugs, 58 (17.1%) received 1 to 2 drugs, and the rest (6.2%) did not take any medication. Of 338 participants who reported their health statuses, 230 (68%) rated their health condition as good, 94 (27.8%) as average, and 14 (4.1%) as poor. A significant relationship existed between poor self-perceived health and sleep disturbance (p<0.001). In terms of functional capacity, 310 (91.2%) participants were totally independent, as opposed to 30 (8.8%) participants who were partially able to live independently. The majority of elderly (n=314, 92.4%) showed cognitive impairment that was not significantly associated with depression. Of the 314 cognitively impaired, 126(40.13%) had mild cognitive impairment whereas 9 (6.87%) had moderate to severe cognitive impairment. Similarly, comorbidity, prior history of depression, use of medication, and impaired functional capacity were also not significantly associated with depression.

Characteristic	Total		Depression		p-value*
	N	%	N	%	
Chronic medical illness					
Yes	276	81.2	116	42	0.545
No	64	18.8	27	42.2	
Medication use					
Non	21	6.2	7	33.3	
2-Jan	58	17.1	24	41.4	0.767
4-Mar	113	33.2	46	40.7	
>5	148	43.5	66	44.6	
Perceived health status					
Good	230	68	96	41.7	
Average	94	27.8	36	38.3	0.017
Poor	14	4.1	11	78.6	
Functional capacity					
Totally independent	310	91.2	126	40.6	0.067
Partially independent	30	8.8	17	56.7	
History of depression					
Yes	115	33.8	55	47.8	0.077
No	225	66.2	88	39.1	
History of Sleep disturbance					
Yes	170	50	89	52.4	0.001
No	170	50	54	31.8	
Cognitive assessment					
Normal	26	7.6	8	30.8	0.157
All levels of impairment	314	92.4	135	43	
*P value is based on chi square					

Table 2: The association between depression and health status characteristics with regard to co-morbidity, medication, perceived health, ADL and CMI of participants (N=340)

Table 3 shows the association between depression and certain socioeconomic characteristics of participants. The majority of participants (n=312, 91.8%) were living with others. Two-thirds (66.2%) were living with spouses and sons or were cared for by house helpers, and one-third (n=115, 33.8%) had no caregivers. A significant association existed between the absence of a caregiver and depression (p=0.032). Of the participants, 297 (87.3%) were financially supported by either themselves or their sons, and 39 (11.5%) were supported by the government. One hundred ninety five (57.4%) participants had a family income per month that ranged between 1000 Saudi Riyal (SAR) and 5000 SAR (1USD=3.75 SAR). Those with a monthly income of less than 1000 SAR (17.4%) numbered almost the same as those with a monthly income of more than 5000 SAR (17.9%). The association between depression and low income was statistically significant (p=0.005). Factors that did not show a significant association with depression included living alone or sharing accommodations, having a family system, financial support, loss of a close person, and recreational activities.

Characteristics	Total		Depression		p-value*
	N=340	%	N%		
Private room					
Specified for me	270	79.4	108	40	
Specified shared	68	20	33	48.5	0.111
No specific	2	0.6	2	100	
Living condition					
Alone	28	8.2	10	35.7	0.308
With others	312	91.8	133	42.6	
Family system					
Nuclear	163	47.9	68	41.7	0.477
Extended	176	51.9	75	42.6	
Caregiver					
Nobody	115	33.8	54	47	
Sons	152	44.7	68	44.7	0.032
Others(spouse, househelper)	73	21.5	21	28.8	
Financial support					
Self	146	42.9	54	37	
Sons	151	44.4	72	47.7	0.132

Governmental support	39	11.5	16	41	
Monthly income					
**Less than 1000 SAR	59	17. 4	32	54.2	
1000-5000	195	57.4	88	45.1	0.005
More than 5000	61	17.9	16	26.2	
I don't want answer	25	7.4	7	28	
Loss of close person					
Yes	135	39.7	55	40.7	0.387
No	205	60.3	88	42.9	
Participation in recreational activities					
Yes	154	45.3	57	37	0.054
No	186	54.7	86	46.2	
*P value is based on chi square **1 USD = 3.75 SAR (Saudi Riyal)					

Table 3: Association between depression and characteristics of participants regarding certain socioeconomic factors.

Table 4 shows the distribution of depression in regard to medical chronic illnesses and disability reported by the participants. The association between depression and the following chronic illnesses or disability among participants was statistically significant: diabetes (p=0.001), heart disease (p=0.001), joint disease (p=005), and disability (p=0.007). The result did not reach significance for other comorbidities, namely dyslipidemia, hypertension, bronchial asthma, thyroid disease, and osteoporosis.

P value*	Depression		Disease
	%	N	
0.518	(42.2) (41.8)	84 59	Dyslipidemia No dyslipidemia
0.001	(32.9) (49.5)	50 93	Diabetes No diabetes
0.505	(41.8) (42.3)	74 69	Hypertension No hypertension
0.001	(55.7) (36.6)	54 89	Heart disease No heart disease
0.005	(35.6) (50.0)	67 76	Joint disease No joint disease
0.007	(58.5) (39.0)	31 112	Disability No disability
0.263	(47.1) (41.2)	24 119	Bronchial asthma No bronchial asthma
0.314	(45.2)	33	Thyroid disease
	(41.2)	110	No thyroid disease
0.492	(41.4) (42.3)	36 107	Osteoporosis No osteoporosis

Table 4: Distribution of depression with self-reported chronic medical illnesses and disability among participants

Table 5 shows the results of a logistic regression analysis to predict the independent variables that have a significant relationship to depression, which included monthly income (p=0.031), caregiver (p=0.012), diabetes (p=0.013), disability (p=0.012), and sleep disturbance (p=0.029). Altogether these predictors were able to explain 18.6% of the depressive symptoms experienced by the participants (p<0.001). The other predictors that did not attain statistical significance were perceived health status, heart disease, and joint disease.

Variables	P value	Odds Ratio	(95.0% confidence interval for odds ratio)	
Perceived Health Status	0.126	1.049	0.987	1.116
Monthly income	0.031	0.706	0.515	0.969
Caregiver	0.012	0.655	0.471	0.911
Heart disease	0.128	0.661	0.388	1.127
Diabetes	0.013	1.834	1.135	2.964
Joint disease	0.051	1.666	0.997	2.783
Disability	0.012	0.427	0.219	0.832
Sleep disturbance	0.029	0.575	0.35	0.946
Chi square is 410.07, p-value < 0.001, R2 = 18.6%				

Table 5: Logistic regression analysis showing independent predictors of depression in the participants

Discussion

Severity of Depression: Our findings revealed that the depression among elderly females aged 65 and older was 42.1%. This proportion was much higher than the international figure of 10% to 15% reported in elderly who live in community settings [4,23], and slightly higher than a local study that estimated depression rate at 17.5% [12]. The figure was also higher compared to similar studies among elderly reported in neighboring Iraq (38.9%), Kuwait (25%), and Jordan (24.3%) [9-11,24]. However, the findings were consistent with depression rates predicted in Caucasian and Indian community samples (14% to 49% vs. 6% to 50% respectively) [5,8]. These findings raise the concern that this population group is vulnerable to mental health issues [25].

Mild depression was observed in 39.9% of the participants, which was much higher than the rate reported in Chinese immigrants in North America [19,25]. A moderate to severe depression range was found in only 2.6% of our sample, which was lower than the national figure of 8.4% [13] and the regional figure of 7.5% among Bahraini elderly females [24]. However, Lai's study reported a lower prevalence of 2% among Chinese elderly [25]. The present findings lacked association between depression and cognitive functions.

It is unclear whether this wide divergence in symptoms of depression was largely due to methodological differences in study designs or instruments [5]. Various experts in the field attributed this variation to problems in the definitions of depression, varying sampling strategies, and sample sizes used by different studies [5,15]. Beekman et al. [19] explained the differences in terms of systematic bias due to translations and the administration of screening instruments to non-native English subjects. Another possible explanation could be the fact that our study assessed only the female gender. A host of studies showed that depression in elderly women was twice that found in elderly men (33% vs. 15.7%) and that women were more likely to report depression than men [5,12,15,23]. Thus, the high rates of depression in the present study could be explained by women being more vulnerable, more exposed to etiological factors and lacking rewarding roles in society and are, therefore more apt to report symptoms of depression [26].

Socio-demographic Variables: The obtained findings showed that all participants were unemployed, more than half were widowed, and the majority lived in urban areas with an informal education. These socio-demographic variables may not only have complicated depressive symptoms but also may have led to potential economic difficulties and to the absence of a caregiver [5,27]. Several studies indicated a possible risk for depression among the widowed elderly with lower educational levels who were affected by urbanization and decreased caregiving support [5,23].

In the present study, a logistic regression analysis identified the socio-demographic characteristics of low income and the presence of a caregiver as independent risk factors for depression. However, the results did not reach significance for the financial support and functional capacity variables as 91.2% of the participants reported total independence and 79.4% had independent living arrangements in the presence of others (91.8%). One possible explanation for these findings could be that KSA is an affluent country, and two-thirds of the participants were either financially self-sufficient or were cared for by their relatives. Also, more than 10% of those with low incomes received pensions from the government. This proportion was considerably lower than the proportion of elderly women receiving pensions reported in other studies [27]. We assumed that the abundance of economic resources available for basic living conditions, such as housing and free healthcare, decreased the dependence on caregivers and improved the perceived health status of participants. Logistic regression analysis failed to predict perceived health status as a significant risk factor for depression.

Health Status Characteristics: The present study showed sleep disturbance as significantly associated with depression. Previous studies reported similar findings [8,16]. Similarly, the association between depression and a poorly perceived health status existed and was reported by 4.1% of participants. A compatible local finding showed 5% was reported in the southern Saudi City of Abha [12]. By contrast, in two local studies, a high proportion was reported among elderly females (31.2%) [28] and in both genders (23.5%) [13]. Chang and Chueh (2011) found those with poor health status, chronic disease and high dependence on others for ADL had the highest prevalence of depression [29].

Cognitive Functions: Cognitive function was not identified as having a link to depression; although 92.4% of participants were found to have MCI based on their MoCA scores. This finding contradicts some local and regional studies. For instance, two studies conducted in the cities of Jeddah and Riyadh estimated MCI at 25% and 0.02% respectively [28,30]. In Cairo, depression among healthy elderly men and women was 34.2% and 44.3% respectively [22]. A much lower international rate varied from 3% to 11% in persons 65 years and older and from 25% to 47% in persons 85 years and older [31].

The association between depression and cognitive impairment is far from clear. There is no consensus about whether depression is the consequence or cause for a cognitive deficit in elderly. Previous studies used different diagnostic criteria, and measurements failed to affirm this relationship [32]. The Parmelee et al. [14] study showed that the prevalence of depression rises from 50% to 70% in cognitively impaired patients. Rahman and ElGaafary [22] suggest age and poor education rather than depression are risk factors for MCI. Hence, in our study, the high prevalence of MCI could be because MCIs are concomitant symptoms rather than risk factors for depression. Another possible explanation could be that the instrument employed has been affected by a low level of education or by visual impairment that was not identified prior to the assessment of the participants' cognitive functions.

Physical and Social Characteristics: The World Health Organization found depression to be more frequent in persons with a chronic condition [33,34]. As in other studies, in our sample, depression was significantly associated with the presence of chronic medical illness [16,6,35]. The medical conditions that correlated significantly with depression were diabetes, heart disease, joint disease, and disability. Diabetes was reported by 32.9% of our participants, which is in concert with Rifkn's finding of 33%, and much lower than that of 85% reported in Bahrain [37,24]. After controlling for confounders, heart and joint diseases did not attain statistical significance as predictive factors of depression. This finding contradicts what was found in previous cross-sectional studies [24,36]. Among medical conditions, disability, followed by diabetes ($p=0.013$), was found to be the strongest risk factor for depression ($p=0.012$) and to be more predictive of depression than age [23,38]. Not surprisingly, one-third of participants with a previous history of depression reported sleep disturbance as a predictive risk factor for depression.

The link between depression and chronic illness is complex and should be viewed guardedly. Some investigators suggest that chronic illness is a risk factor for depression only when it results in functional incapacitation [39,40]. Katon suggests a bidirectional relationship, which indicates that a large prevalence of depression among the elderly could be attributable, at least in part, to medical illness, which in turn could contribute to the increase and worsening of depression [16,33,41]. Hence, early detection and management of depression should be a priority when chronic medical illness is present [41].

The strengths of this study include a low non-response rate (1.2%), a relatively large sample of participants, and the administration of validated Arabic instruments to assess elderly females in the most conservative society in KSA. The main limitations of our study include its cross-sectional nature and the fact that we collected our data from the EP (a total of 13 provinces), which may restrict the generalizability of our results. In addition, we did not include a control group from corresponding communities with which to compare depression rates to, and this oversight could introduce some problems regarding interpreting the data and reporting unbiased results. Furthermore, we used the translated version of GDS, which was reported in several studies as being weak and unreliable when administered to people with cognitive impairment or nonnative English- speaking persons [5,42]. Finally, an enormously high level of informal education among

participants may have caused results that overestimated the symptoms of depression.

Despite these limitations, our study's findings are concordant with the previous studies that found level of depression high among the elderly and are associated with multiple psychosocial and medical factors. These findings may also guide efforts to develop programs to prevent depression in high-risk elderly females.

Despite challenges inherent in the clinical study of religion, religious activities were found to be a strongly protective factor against depression and other social and physical ailments [43]. Hence, future research that includes variables on religiosity and spirituality could help to illustrate whether spiritual activities at the QMCs have a beneficial effect on elderly mood and well-being.

Conclusion

We conclude that depressive symptoms are common and higher in Saudi elderly women and are associated with significant physical, psychological, and socioeconomic risk factors.

Author's contributions

AMA initiated the idea of the study, collected the data and contributed to the write-up of manuscript. AHK designed, analyzed and interpreted the data, and helped in write-up of manuscript. AMS involved in the early stage of study design, supervision and ongoing management of data collection. AWA contributed to the interpretation of data and write-up of manuscript. All authors read and approved the final manuscript

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