Prevalence of Depression and Its Influence on the Quality of Life of Jordanians Living in Residential Care Facilities

Rasmieh AL-AMER1* • Maha SUBIH2 • Hanan ALDARAAWI3 • Sue RANDALL4 • Wafaa Mousa Mustafa OTHMAN5 • Yenna SALAMONSON6

ABSTRACT

Background: As a third-world country experiencing a rise in the elderly population and changes to traditional family structures, improving psychological health is critical to improving quality of life (QoL) in the older adults living in residential care facilities in Jordan.

Purpose: This study aimed to (a) estimate the prevalence of depression among nursing home (NH) residents in Jordan; (b) measure perceived QoL in these NH residents in the dimensions of mobility, self-care, usual activity, pain and discomfort, and anxiety/depression; and (c) assess the influence of depression on each of these QoL dimensions.

Methods: This cross-sectional study recruited a convenience sample of 155 participants living in a residential care facility in Jordan. The instruments used included a sociodemographic and clinical questionnaire, the Mini-Mental State Examination, a Geriatric Depression Scale (GDS), and the EuroQol, which is a five-dimension, five-level questionnaire. The data were presented as means, standard deviations, and percent-ages as well as adjusted odds ratios (AORs) with 95% confidence intervals (CIs).

Results: A high prevalence of depression was found in the study population, with 72.3% having a score between 6 and 9 on the GDS, which is suggestive of depression. Moreover, 18.1% scored ≥ 10 on the GDS, which is indicative of a nearly continual state of depression. With regard to the QoL dimensions, 84.5% of the participants reported experiencing pain, 81.9% reported anxiety/depression, 80.6% reported problems performing usual activities, 75.5% reported problems with self-care, and 63.2% reported mobility difficulties. Pain, anxiety, and depression were found to be significantly associated with level of depression (AOR = 2.78 and 95% CI [1.18, 6.57]; AOR = 5.81 and 95% CI [2.14, 15.78], and AOR = 4.75 and 95% CI [1.87, 12.07], respectively).

Conclusions: Depression is common among NH residents in Jordan and is associated significantly with poor QoL. This study yielded empirical data that may be used to develop strategies to enhance or promote the mental health status and QoL of NH residents in Jordan.

Key Words: depression, geriatrics, nursing homes, quality of life.

Introduction

Since the beginning of this millennium, elderly people (≥ 60 years old) have increased significantly as a percentage of the worldwide population (World Health Organization, 2006). This increasing trend is likely to continue globally as well as in Jordan. Jordan, a part of the Arab community of nations, recorded a 5.2% increase in its elderly population in 2011, with this upward trend expected to continue (The High Health Council, The Hashemite Kingdom of Jordan, 2015). Concomitant with this increase are age-related co-morbidities, of which depression, in particular, is recognized as having a significant impact on quality of life (QoL; Scocco & Nassuato, 2017; Snowdon, 2010).

Depression is widespread among the older adults and particularly prevalent among those who live in nursing homes (NHs; Snowdon, 2010). Studies of NH residents in the developed world report that the prevalence of depression and subsyndromal depression symptoms is, respectively, 1%–4% and 10%–15% (Blazer, 2003). Reports from Islamic nations have estimated the overall depression rate to be 23.5% in Iran (Majdi, Ghayour Mobarhan, Salek, Taghi, & Mokhber, 2011), 33.5% in Indonesia (Djernes, 2006), and 37.5% in Egypt (Ahmed, El Shair, Taher, & Zyada, 2014).

Although depression is highly prevalent among NH residents, it is underdiagnosed. Bagley and colleagues found that only 15%–27% of NH residents with depression were
diagnosed as depressed, with the rate of diagnosis varying according to the definition of depression that was used (Bagley et al., 2000). Reflecting this problem, one study in North America found that only around 25% of NH residents with depression had been properly diagnosed and treated (Cohen, Hyland, & Kimby, 2003).

Recent studies have reported that depression lowers QoL in NH residents (Ahmed et al., 2014; Majdi et al., 2011; Snowdon, 2010). Furthermore, it has been found that NH residents with depression face increased risks of both morbidity and mortality, which in turn reduces their QoL (Jongenelis et al., 2004).

When QoL is considered in healthcare settings, it is often referred to as a person's well-being influenced over time by a disease or a disability, related to an individual's contextual expectations (Doumit & Nasser, 2010; Kane, 2003). Of note, the expectations of an individual are subject to change over time based on factors including health and functional status, family and social support, and environment. The dimensions of QoL, which are derived from the definition of health that was adopted by the International Consensus Conference, include complete physical, social, and psychological well-being; global life satisfaction; and self-perceived health condition (Lenox-Smith et al., 2013). Not surprisingly, physical health is the most visible health dimension (Anand, 2015). These constructs are vital in assessing the impact on QoL of a specific disease and its treatment and are thus considered primary indicators in relation to health outcomes. Furthermore, it has been reported that depression, psychiatric problems, and cognitive impairment are the factors that are most significantly associated with reduced QoL (Ahmed et al., 2014).

In Jordan, over two thirds of the elderly population are between 60 and 69 years old, with the remainder (≥ 70 years old) constituting about 27% of this population. Interestingly, the number of elderly men outnumber elderly women in all age subgroups (66.7% male to 33.3% female overall; Al-Qudah, 2011). The percentage of dependent older adults in Jordan is increasing because of the significant rise in the proportion of noncommunicable diseases including hypertension, diabetes, cancer, and heart and vascular diseases (The High Health Council, The Hashemite Kingdom of Jordan, 2015), which are currently the main cause of morbidity and disability in Jordan (The High Health Council, The Hashemite Kingdom of Jordan, 2015).

The dissolution of the traditional extended family system and the trend toward urbanization have reduced the level of care and support that is traditionally provided by close relatives to older and disabled family members. Close relatives are now qualified to admit the older adult to elderly care facilities. Moreover, nonelderly individuals facing acute economic, social, or health needs are also eligible for admission to elderly care facilities in Jordan (Al-Qudah, 2011).

No clear legislation or policies underpin the services provided by elderly care facilities in Jordan (Al-Qudah, 2011). However, some of these facilities provide modest recreation and social services such as watching TV, outdoor exercise in facility yards, and some social gathering activities (The

Study Questions

This study was designed to address the following research questions.

1. What are the prevalence of depressive symptoms and the status of QoL dimensions of mobility, self-care, usual activity, pain and discomfort, and anxiety/depression among the elderly residents of NHs?

2. What is the status of the following QoL dimensions among older adults in NHs: mobility, self-care, usual activity, pain and discomfort, and anxiety/depression?

3. What is the relationship between depression and each of these QoL dimensions after controlling for age, gender, and marital status?
Methods

Study Design, Sample, and Setting
This article was prepared in accordance with Strengthening the Reporting of Observational Studies in Epidemiology guidelines (Von Elm et al., 2014). This cross-sectional study recruited a convenience sample of 155 participants from NH residents in Jordan. Data collection was undertaken between March 15 and July 30, 2017. To establish trust and assist recruitment, the first author arranged a face-to-face presentation on the study before distributing flyers about the study to each section in the NH. All potential participants were informed that participation was voluntary. A power analysis using the G*Power program (Version 3.0.10) determined that a sample size of 108 was needed to answer the study questions with an alpha level set at .05, a beta level set at .90, and an effect size set to medium. The sample was composed of Jordanian elderly individuals who were currently residing in the largest NH in Jordan (in Amman, the national capital). Although the target NH is privately operated, an agreement with the government allows qualified older adults who lack social support and who experience health or economic problems to apply to live in the facility.

Recruitment of Participants
Two of the researchers administered the questionnaires in a standardized manner. The study was approved by the institutional review board under the Isra University Research and Ethics Committee (Approval Number 1620/6/SJ). Participants were required to meet the following criteria: (a) current NH resident, (b) willing to participate and able to communicate verbally, and (c) no significant cognitive impairment as determined using the Arabic Mini-Mental State Examination (AMMSE; Al-Rajeh et al., 1999). Furthermore, those known to experience terminal illnesses were excluded from the study. Permission to access participants’ medical files was also obtained from the residents, staff, and directors at the NH.

Measures
The study used a survey composed of four major sections, including those listed hereinafter.

Sociodemographic and clinical questionnaires
The sociodemographic and clinical questionnaires were developed by the researchers based on previous studies. The sociodemographic section gathered data on participant age, gender, education, marital status, height, and weight. The clinical information was gathered from the medical files of participants and included data on hypertension, diabetes mellitus, high cholesterol, cardiac condition, stroke, and mental illness background.

Geriatric Depression Scale
Severity of depressive symptoms was assessed using the Geriatric Depression Scale (GDS). The GDS is a validated 15-item scale with a demonstrated sensitivity of 85% and a specificity of 74% for detecting depression (Herrmann et al., 1996) and a Cronbach’s alpha of .81 (Almeida & Almeida, 1999). Using a yes/no response format, the GDS is designed to assess mood during the immediately preceding 7-day period. Higher scores on GDS indicate more severe depression. The cutoffs for GDS used in this study were as follows: 0–5, normal; ≥ 5 to 9, indicative of depression; and ≥ 10, indicative of continual depression (Herrmann et al., 1996).

EuroQol five-dimensions, five-levels questionnaire
QoL was evaluated using the EuroQol five-dimensions, five-levels questionnaire (EQ-5D-5L), which consists of five questions with five response categories (Brooks, Rabin, & de Charro, 2013). The questions respectively evaluate the domains of mobility status, self-care behaviors, usual activities, pain, and mental health status, the latter of which includes anxiety/depression (Brooks et al., 2013). This scale uses a Likert-scale response format with the following anchoring points: 0 = no problem, 1 = slight problem, 2 = moderate problem, 3 = severe problem, and 4 = extreme problem (Brooks et al., 2013).

EuroQol visual analogs
The EuroQol visual analog scale reports self-evaluated health using a 100-point, 20-cm vertical, visual analog measure with end points marked as, respectively, the best (100) and the worst (0) health an individual is able to imagine (Brooks et al., 2013). Scale data are used to quantify self-perceived health status. In this study, the interviewers asked the participants to “mark an X symbol on the visual analog scale to show how their health is TODAY” and then to write the corresponding score number in the box at the bottom of the scale. If a discrepancy was found between the location of the symbol X and the written number, this study used the number that was written in the box.

Arabic Mini-Mental State Examination
In this study, cognitive impairment screening was assessed using the AMMSE (Al-Rajeh et al., 1999), which is a 30-item instrument with demonstrated validity and reliability that has been used widely to assess cognitive functioning. AMMSE has a score range of 0–30, with a score < 18 indicating severe cognitive impairment, 18–23 indicating mild cognitive impairment, and 24–30 indicating no cognitive impairment (Al-Rajeh et al., 1999). Otherwise qualified participants who earned an aggregate AMMSE score below 18 were excluded from this study to ensure that the results would not be affected by significant cognitive decline (Tombaugh & McIntyre, 1992). Word list recall was used for participants with low educational levels who were unable to perform AMMSE Item 9, “Please read this and do what it says,” and AMMSE Item 10, “Make up and write a sentence about anything” (Gavett & Horwitz, 2011).

Translation procedure and pilot testing
The translation method described by Sousa, Hartman, Miller, and Carroll (2009) was used to translate the GDS and the
EQ-5D-5L from English into Arabic. A panel of experts (three clinical nurses, one doctor with a PhD in rehabilitation science, two academics specializing in community nursing, and two laypersons with a good command of both the Arabic and English languages) translated the questionnaires (forward and backward translation). The panel discussed the discrepancies between the original versions of the questionnaires and the translated versions, and the questionnaires were iterated as necessary until consensus was reached. The survey was then pilot tested with 10 participants from the targeted NH facility who met the inclusion criteria to validate the feasibility of the survey and estimate the appropriate time needed for data collection. The final version of the survey was finalized based on the comments and suggestions of the panel and pilot study participants. The data of these 10 participants were excluded from the final report to avoid data contamination.

Data Collection
Before conducting the interviews, the main researcher explained in detail the aim of the study to the residents of the NH. Three of the researchers approached the residents who met the inclusion criteria, and those who agreed to participate were asked to sign a consent form. After the participants had completed the surveys, the required clinical data were copied from their medical files.

Rigor in Data Collection
In this study, the clinical data were abstracted directly from participants’ medical records. Thus, it was important to engage three of the researchers in the data collection process, two of whom had a nursing background and one of whom had a medical background. This was important because abstraction of the data from the files of participants should be conducted by someone who is familiar with both the relevant medical terms and the structure of the medical records to avoid misinterpretation and enhance the validity of the data. In addition, the abstraction process was observed via a table that showed the predetermined variables that were relevant to this study. Furthermore, having a medical or nursing background provides a thorough knowledge and awareness of human ethics that is critical in those who have access to medical records to fully protect participants’ rights. The qualifications of the study data abstractors helped ensure that ethical requirements were fully upheld.

Operational Definitions
In line with similar scholarly research, elderly persons should be defined in the context of functional ability in relation to the workforce and the current political and economic situation (Thane, 1978). Hence, old age was defined in this study based on the age of retirement in Jordan, which is between 45 and 55 years for women and 55 and 65 years for men (Al-Qudah, 2011). In this study, mobility was defined as the ability to move in one’s surroundings effectively and without restrictions (World Health Organization, 1980); self-care was defined as any activity that a person performs after health-related needs arise with the intention of managing these needs (Webber, Guo, & Mann, 2013); usual activity was defined as activities of daily living that are practiced independently without assistance (including eating, bathing, dressing, toileting, walking, and continence; Covinsky et al., 2003); pain was defined as any highly unpleasant feelings, physical discomfort, or emotional discomfort that results from illness or injury (Derbyshire, 1999); and anxiety was defined as a diffuse feeling of worry and/or apprehension about future events that is associated with uncertainty and helplessness (Nolen-Hoeksema, 2004). Furthermore, education was categorized into primary school or less (10 years of study or equivalent) and secondary school or higher (more than 10 years of study or equivalent), and elderly care facility was defined as a facility that provides care that fulfills the special needs of the older adults in terms of accommodations and assistance with day-to-day living (Al-Qudah, 2011).

Data Analysis
Statistical analyses were held using an SPSS Version 24 (IBM, Armonk, NY, USA). Internal consistency of the GDS in this study was computed using the Cronbach’s alpha (α = .69), but not for the QoL EuroQol five-dimensions questionnaire (EQ-5D), as this value does not provide useful information about this instrument (Konerd, 2013). A score of ≥ 6 on the GDS was interpreted as indicating the presence of some depressive symptoms (Herrmann et al., 1996). For the EQ-5D-5L scale, each QoL dimension was clustered into two levels: having no problem (0) and having a slight to extreme problem (1). Descriptive statistics were obtained to summarize the sociodemographic and clinical data of the study participants (Gerstman, 2008). A multivariate regression model was used to predict the relationship between each of the QoL dimensions (mobility, self-care, usual activities, pain, and anxiety/depression) and depression after controlling for the three sociodemographic characteristics of age, gender, and education. A p value of < .05 was considered significant.

Results
Three hundred twenty residents were invited to participate in this study, of which 200 (62.5%) completed the questionnaire. The AMMHS was used to screen for study eligibility, and 45 residents were excluded after completion because of moderate-to-severe cognitive impairment based on their AMMSE score (< 18) and taking into consideration that the mean (SD) of AMMSE was 24.1 (3.20; Table 1).

Therefore, 155 participants completed the study questionnaire. Four fifths (83.2%) of the participants were male, the median age was 67 (range: 56–87) years, and over three quarters (76.1%) were married. The highest educational level of more than one third (34.8%) was primary school (Table 1). In terms of the depression scores, as measured
TABLE 1.
Characteristics of Participants (N = 155)

| Variable                        | n   | %    |
|---------------------------------|-----|------|
| Age (years; M, SD)              | 68.96 | 7.67 |
| Range, median                   | 56–87 | 67.00 |
| Gender                          |      |      |
| Female                          | 26  | 16.8 |
| Male                            | 129 | 83.2 |
| Marital status                  |      |      |
| Single, widowed, divorced       | 37  | 23.9 |
| Married                         | 118 | 76.1 |
| Highest educational level       |      |      |
| Primary school or less (≤ 10 years) | 54 | 34.8 |
| Secondary school or more (> 10 years) | 101 | 65.2 |
| Associated medical conditionsa |      |      |
| Hypertension                    | 106 | 68.4 |
| Diabetes mellitus               | 102 | 65.8 |
| High cholesterol                | 40  | 25.8 |
| Cardiac condition               | 34  | 21.9 |
| Stroke score (M, SD)            | 30  | 19.4 |
| Mental illness                  | 15  | 9.7  |
| MMSE score (M, SD)              | 24.10 | 3.20 |
| Range, median                   | 4–12 | 25.00 |
| 18–23 (mild cognitive impairment) | 65 | 41.9 |
| 24–30 (no cognitive impairment) | 90  | 58.1 |
| BMI (kg/m²; M, SD)              | 25.79 | 4.01 |
| Range, median                   | 17.3–38.8 | 25.00 |
| Quality of life dimensions [EQ-5D]a |      |      |
| Problems with mobility          | 98  | 63.2 |
| Problems with self-care         | 117 | 75.5 |
| Problems with pain              | 131 | 84.5 |
| Problems with usual activities  | 125 | 80.6 |
| Problems with anxiety           | 127 | 81.9 |
| GDS score (M, SD)               | 7.65 | 1.78 |
| Range, median                   | 4–12 | 7.00 |
| Best health today (EQ-VAS; M, SD) | 52.86 | 25.34 |
| Range, median                   | 0–100 | 55.00 |

Note. MMSE = Mini-Mental State Examination; BMI = body mass index; EQ-SD = EuroQol five dimensions; GDS = Geriatric Depression Scale; EQ-VAS = EuroQol visual analog scale.

Depression as a Predictor of Problems With Quality of Life Dimensions

To examine for predictors of each of the QoL dimensions, the same four variables were entered simultaneously into each of the logistic regression models. Those who reported problems with mobility were over three times more likely to be older (AOR = 3.7, 95% CI [1.77, 7.94]) and twice as likely (AOR = 2.78, 95% CI [1.18, 6.57]) to have high depression scores (GDS score > 7), taking into account marital status and level of education (Table 2).

In this study, depression was not found to predict problems with self-care or with usual activities. However, those who reported problems with pain were nearly six times (AOR = 5.81, 95% CI [2.14, 15.78]) more likely to have high depression scores (≥ 7). Similarly, those with anxiety/depression problems were over four times (AOR = 4.75, 95% CI [1.87, 12.07]) more likely to have high depression scores. The variance explained for each of the four regression models (Nagelkerke $R^2$) and model fits (Hosmer–Lemeshow test) are shown in Table 2.

Discussion

The principal purpose of this study was to assess the prevalence of depression and its association with the QoL dimensions of mobility, self-care, pain and discomfort, usual activity, and anxiety/depression. The sample was composed of Jordanian residents of a large NH. Most of the participants were afflicted by hypertension and diabetes, and only a few had some form of mental illness. These results are consistent with national statistics that show hypertension and diabetes mellitus as highly prevalent and as main causes of disability among Jordanians (The High Health Council, The Hashemite Kingdom of Jordan, 2015).

In addition, over two thirds of the participants in this study experienced mild depression, and around a quarter reported moderate-to-severe depressive symptoms, suggesting poor mental health status. These results are consistent with the “even higher scores” reported in Majdi et al. (2011), which also found that around a quarter of their study participants had experienced depression, and with a study conducted in Egypt (Ahmed et al., 2014), which reported an overall depression rate of around 30% among NH residents in Cairo. A possible explanation for these results is that this sample of Jordanian participants reported high levels of depressive symptoms because of several factors, potentially in the physiological and/or social realms, which complicated their psychological status and reduced self-perceived QoL. The high number of participants experiencing various comorbid conditions such as hypertension, diabetes, high cholesterol, heart problems, cerebrovascular disease, and psychiatric illness supports this supposition. Comorbidity has been reported as a risk factor for depression and lower QoL (Anand, 2015; Scocco & Nassuato, 2017). In addition, other factors such as age, marital status, and educational level may have impacted the relationship between depression and QoL. For example, 10 years of schooling may have been a protective factor that reduced the impact of depression on

using the GDS, 90.3% scored > 5 and 72.3% of the participants scored in the 5–9 range, which is suggestive of depression and warrants follow-up for a comprehensive assessment. Moreover, 18.1% of the participants scored ≥ 10 on the GDS, which suggests a state of almost continual depression. The median GDS score in this sample was 7 (range: 4–12, maximum score: 15; Table 1).

In relation to the QoL dimensions assessed using the EQ-5D, nearly two thirds (63.2%) reported problems with mobility. The percentages of participants reporting problems in the other four QoL dimensions were even higher, with the largest number (84.5%) reporting problems with pain (Table 1).
the QoL among those who are < 67 years old and reported being affected by pain and discomfort. Furthermore, being unmarried may have decreased the effect of depression in those who had problems with usual activities and anxiety/depression. The literature on this issue is unclear, with some studies confirming this effect and others rejecting it (Mielck, Vogelmann, & Leidl, 2014). In addition, spiritual and cultural factors were not measured in this study and may have complicated the depressive symptoms. To illustrate, most Arabs are Muslims, and the spiritual and cultural orientation of Muslims as well as the Qur’an forbid Muslims from sending their older adults to geriatric care facilities. Islam mandates that older people in the community, particularly parents, should be treated with great respect (Holy Quran 17:23–24). Consequently, sending older adults to NHs may represent unfulfilled spiritual and cultural obligations, which in turn may elicit feelings of despair (Al-Heeti, 2007).

Furthermore, this study found overall low levels for the QoL dimensions among the participants. Anxiety/depression and pain were the most prevalent problems, followed by self-care and mobility, in decreasing order. This finding helps confirm that the EQ-5D assesses different aspects of health (Konerding, 2013). A likely explanation for these results is that the participants were well supported in meeting their mobility and self-care needs and that pain and anxiety/depression are highly subjective issues that may be less visible to NH staff and hence at a greater risk of being overlooked and untreated.

Finally, this study found a significant association between depression and the three QoL dimensions of pain, anxiety/depression, and mobility, which echoes similar findings in the literature that linked pain (Blazer, 2003; Snowdon, 2010), anxiety/depression (Ahmed et al., 2014; Blazer, 2003; Creighton, Davison, & Kissane, 2017; Snowdon, 2010), and mobility problems (Ahmed et al., 2014) with high levels of depressive symptoms and subsequently lower, which in turn lower QoL in NH residents (Scocco & Nassuato, 2017). Early detection of depression will be critical to promoting QoL in this sample of NH residents. The high proportion of older adults in Jordan with depression symptoms and functional disabilities is a concern that warrants routine assessment by health professionals. Moreover, the influence of depression on the three QoL dimensions of pain, anxiety/

**TABLE 2.**

Logistic Regressions of Participant Characteristics and Depression Associated With Quality of Life Dimensions

| EQ-5D/Variable                          | Adjusted Odds Ratio | 95% CI     | p     | Model Summary |
|-----------------------------------------|---------------------|------------|-------|---------------|
| **Problems with mobility**              |                     |            |       | R²  | χ²  | df | p |
| Age: ≥ 67 years                         | 3.74                | [1.77, 7.94] | .001* | .175 | 7.94 | 6  | .242 |
| Marital status: Married                  | 1.34                | [0.59, 3.05] | .480  |     |     |    |    |
| Highest education level: Secondary school or higher | 1.87     | [0.86, 4.07] | .115  |     |     |    |    |
| GDS score: ≥ 7                          | 2.78                | [1.18, 6.57] | .020* |     |     |    |    |
| **Problems with self-care**             |                     |            |       | .057 | 4.25 | 7  | .750 |
| Age: ≥ 67 years                         | 1.64                | [0.75, 3.58] | .251  |     |     |    |    |
| Marital status: Married                  | 2.01                | [0.88, 4.57] | .098  |     |     |    |    |
| Highest education level: Secondary school or higher | 1.45    | [0.62, 3.38] | .394  |     |     |    |    |
| GDS score: ≥ 7                          | 1.03                | [0.44, 2.42] | .940  |     |     |    |    |
| **Problems with pain/discomfort**       |                     |            |       | .236 | 6.14 | 7  | .524 |
| Age: ≥ 67 years                         | 3.49                | [1.18, 10.27] | .024* |     |     |    |    |
| Marital status: Married                  | 1.07                | [0.34, 3.39] | .909  |     |     |    |    |
| Highest education level: Secondary school or higher | 4.54    | [1.60, 12.89] | .004* |     |     |    |    |
| GDS score: ≥ 7                          | 5.81                | [2.14, 15.78] | .001* |     |     |    |    |
| **Problems with usual activities**      |                     |            |       | .081 | 4.89 | 7  | .673 |
| Age: ≥ 67 years                         | 1.79                | [0.76, 4.22] | .180  |     |     |    |    |
| Marital status: Married                  | 2.63                | [1.01, 6.28] | .029* |     |     |    |    |
| Highest education level: Secondary school or higher | 1.31    | [0.51, 3.33] | .576  |     |     |    |    |
| GDS score: ≥ 7                          | 1.14                | [0.43, 2.97] | .795  |     |     |    |    |
| **Problems with anxiety**               |                     |            |       | .159 | 11.56| 8  | .172 |
| Age: ≥ 67 years                         | 1.62                | [0.64, 4.15] | .311  |     |     |    |    |
| Marital status: Married                  | 2.73                | [1.05, 7.10] | .040* |     |     |    |    |
| Highest education level: Secondary school or higher | 1.69    | [0.61, 4.70] | .314  |     |     |    |    |
| GDS score: ≥ 7                          | 4.75                | [1.87, 12.07] | .001* |     |     |    |    |

Note. CI = confidence interval; EQ-5D = EuroQol five dimensions; GDS = Geriatric Depression Scale.

*p < .05.
depression, and mobility problems in NH residents requires further investigation. There is a need to raise awareness of the prevalence of depression and of the low QoL among NH residents to develop interventions and policies that improve the QoL of NH residents. In addition, future studies should explore spiritual and cultural issues to evaluate the impact on depression and QoL of elderly Arabs.

**Limitation of the Study**

This study was affected by several limitations. First, the convenience sample used in this study may not be representative of the general population of NH residents in Jordan. Second, as most of the study participants were men, this imbalanced ratio in favor of men precluded our comparing the impact of depressive symptoms on the QoL dimensions by gender. However, as previously mentioned, men outnumber women in all age groups in the Jordanian population. Third, the cross-sectional design used in this study did not allow inferences regarding direction of causality between the study variables. Finally, this study did not examine the interrater reliability for chart reviews, although this likely did not reduce the precision of the data used, as all of the data abstractors both were familiar with the medical records and used a consistent and precise table for the abstraction process. Because the observed associations underpinned its findings, the generalizability of this study should be inferred with caution. Despite the above limitations, the findings of this study are an important reference that should inform health policy makers and healthcare providers in Jordan regarding the mental health status and QoL of this marginalized cohort.

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**References**

Ahmed, D., El Shair, I. H., Taher, E., & Zyada, F. (2014). Prevalence and predictors of depression and anxiety among the elderly population living in geriatric homes in Cairo, Egypt. The Journal of the Egyptian Public Health Association, 89(3), 127–135. https://doi.org/10.1087/01.EPX.000045729.66131.49

Al-Heeti, R. M. (2007). Why nursing homes will not work: Caring for the needs of the aging Muslim American population. The Elder Law Journal, 15, 205–231.

Almeida, O. P., & Almeida, S. A. (1999). Short versions of the Geriatric Depression Scale: A study of their validity for the diagnosis of a major depressive episode according to ICD-10 and DSM-IV. International Journal of Geriatric Psychiatry, 14(10), 858–865.

Almomani, F. M., McDowd, J. M., Bani-Issa, W., & Almomani, M. (2014). Health-related quality of life and physical, mental, and cognitive disabilities among nursing home residents in Jordan. Quality of Life Research, 23(1), 155–165. https://doi.org/10.1007/s11136-013-0461-2

Al-Qudah, H. S. S. (2011). Planning of nursing home care services in Jordan: Its reality and challenges. Asian Social Science, 7(10), 94. https://doi.org/10.5539/ass.v7n10p94

Al-Rajeh, S., Ogguniyi, A., Awada, A., Daif, A., & Zaidan, R. (1999). Preliminary assessment of an Arabic version of the Mini-Mental State Examination. Annals of Saudi Medicine, 19(2), 150–152. https://doi.org/10.5144/0256-4947.1999.150

Anand, A. (2015). Understanding depression among older adults in six low–middle income countries using WHO-SAGE survey. Behavioral Health, 2(1), 1–11.

Bagley, H., Cordingley, L., Burns, A., Mozley, C. G., Sutcliffe, C., Challis, D., & Huxley, P. (2000). Recognition of depression by staff in nursing and residential homes. Journal of Clinical Nursing, 9(3), 445–450. https://doi.org/10.1046/j.1365-2702.2000.00390.x

Blazer, D. G. (2003). Depression in late life: Review and commentary. The Journals of Gerontology Series A: Biological Sciences and Medical Sciences, 58(3), M249–M265. https://doi.org/10.1093/gerona/58.3.M249

Brooks, R., Rabin, R., & de Charro, F. (2013). The measurement and valuation of health status using EQ-5D: A European perspective—Evidence from the EuroQol BIOMED research programme. Houten, The Netherlands: Springer.

Cohen, C. I., Hyland, K., & Kimhy, D. (2003). The utility of mandatory depression screening of dementia patients in nursing homes. American Journal of Psychiatry, 160(11), 2012–2017. https://doi.org/10.1176/appi.ajp.160.11.2012

Costanza, R., Fisher, B., Ali, S., Beer, C., Bond, L., Bourmans, R., ... Farley, J. (2007). Quality of life: An approach integrating opportunities, human needs, and subjective well-being. Ecological Economics, 61(2), 267–276. https://doi.org/10.1016/j.ecolecon.2006.02.023

Covinsky, K. E., Palmer, R. M., Fortinsky, R. H., Counsell, S. R., Stewart, A. L., Kresevic, D., ... Landefeld, C. S. (2003). Loss of independence in activities of daily living in older adults hospitalized with medical illnesses: Increased vulnerability with age. Journal of the American Geriatric Society, 51(4), 451–458. https://doi.org/10.1046/j.1532-5415.2003.51152.x

Creighton, A. S., Davison, T. E., & Kissane, D. W. (2017). The correlates of anxiety among older adults in nursing homes and other residential aged care facilities: A systematic review. International Journal of Geriatric Psychiatry, 32(2), 141–154. https://doi.org/10.1002/gps.4378

Derbyshire, S. W. G. (1999). The IASP definition captures the essence of pain experience. Pain Forum, 8(2), 106–109. https://doi.org/10.1016/S1082-3174(99)70036-X
Djernes, J. K. (2006). Prevalence and predictors of depression in populations of elderly: A review. *Acta Psychiatrica Scandinavica, 113*(5), 372–387. https://doi.org/10.1111/j.1600-0447.2006.00770.x

Doumit, J., & Nasser, R. (2010). Quality of life and wellbeing of the elderly in Lebanese nursing homes. *International Journal of Health Care Quality Assurance, 23*(1), 72–93. https://doi.org/10.1080/09526861011010695

Gavett, B. E., & Horwitz, J. E. (2011). Immediate list recall as a measure of short-term episodic memory: Insights from the serial position effect and item response theory. *Archives of Clinical Neuropsychology, 27*(2), 125–135. https://doi.org/10.1093/arclin/acr104

Gerstman, B. B. (2008). *Basic biostatistics: Statistics for public health practice* (1st ed., p. 557). Sudbury, MA: Jones and Bartlett.

Herrmann, N., Mittmann, N., Silver, I. L., Shulman, K. I., Busto, U. A., Shear, N. H., & Naranjo, C. A. (1996). A validation study of the Geriatric Depression Scale short form. *International Journal of Geriatric Psychiatry, 11*(5), 457–460. https://doi.org/10.1002/(SICI)1099-1166(199605)11:5<457::AID-GPS2523.0.CO;2-2

Jongenelis, K., Pot, A., Elsses, A., Beekman, A., Kluter, H., & Ribbe, M. (2004). Prevalence and risk indicators of depression in elderly nursing home patients: The AGED study. *Journal of Affective Disorders, 83*(2), 135–142. https://doi.org/10.1016/j.jad.2004.06.001

Kane, R. A. (2003). Definition, measurement, and correlates of quality of life in nursing homes: Toward a reasonable practice, research, and policy agenda. *The Gerontologist, 43*(2, Suppl.), 28–36. https://doi.org/10.1093/geront/43.suppl_2.28

Khader, F. (2011). Quality of life in the nursing homes in Jordan: Perspectives of residents. *Care Management Journals, 12*(4), 149–162. https://doi.org/10.1891/1521-0987.12.4.169

Konerding, U. (2013). What does Cronbach’s alpha tell us about the EQ-5D? A methodological commentary to “Psychometric properties of the EuroQol Five-Dimensional Questionnaire (EQ-5D-3L) in caregivers of autistic children.”. *Quality of Life Research, 22*(10), 2939. https://doi.org/10.1007/s11136-013-0430-9

Lenox-Smith, A., Macdonald, M. T., Reed, C., Tylee, A., Peveler, R., Quail, D., & Wildgust, H. J. (2013). Quality of life in depressed patients in UK primary care: The FINDER study. *Neurology and Therapy, 2*(1–2), 25–42. https://doi.org/10.1007/s40120-013-0006-1

Majdi, M. R., Ghayour Mobarakhan, M., Salek, M., Taghi, M., & Mohkber, N. (2011). Prevalence of depression in an elderly population: A population-based study in Iran. *Iranian Journal of Psychiatry and Behavioral Sciences, 5*(1), 17–24.

Mielck, A., Vogelmann, M., & Leidl, R. (2014). Health-related quality of life and socioeconomic status: Inequalities among adults with a chronic disease. *Health and Quality of Life Outcomes, 12*(1), 58. https://doi.org/10.1186/1477-7525-12-58

Nolen-Hoeksema, S. (2004). *The response styles theory*. In C. Papageorgiu & A. Wells (Eds.), *Depressive rumination: Nature, theory and treatment* (pp. 105–123). Chichester, UK: Wiley.

Scocco, P., & Nassuato, M. (2017). The role of social relationships among elderly community-dwelling and nursing-home residents: Findings from a quality of life study. *Psychogeriatrics, 17*(4), 231–237. https://doi.org/10.1111/psyg.12219

Snowdon, J. (2010). Depression in nursing homes. *International Psychogeriatrics, 22*(7), 1143–1148. https://doi.org/10.1017/S1041610210001602

Sousa, V. D., Hartman, S. W., Miller, E. H., & Carroll, M. A. (2009). New measures of diabetes self-care agency, diabetes self-efficacy, and diabetes self-management for insulin-treated individuals with type 2 diabetes. *Journal of Clinical Nursing, 18*(9), 1305–1312. https://doi.org/10.1111/j.1365-2702.2008.02729.x

Thane, P. (1978). Muddled history of retiring at 60 and 65 (0028-6729). *New Society, 45*(826), 234–236.

The High Health Council, The Hashemite Kingdom of Jordan. (2015). *The national strategy for health sector in Jordan 2015–2019*. Retrieved from http://www.hhc.gov.jo/uploadedimages/The%20National%20Strategy%20for%20Health%20Sector%20in%20Jordan%202015-2019.pdf

Tombaugh, T. N., & McIntyre, N. J. (1992). The Mini-Mental State Examination: A comprehensive review. *Journal of the American Geriatrics Society, 40*(9), 922–935. https://doi.org/10.1111/j.1532-5415.1992.tb01992.x

Von Elm, E., Altman, D. G., Egger, M., Pocock, S. J., Gøtzsche, P. C., Vandenbroucke, J. P., & Initiative, S. (2014). The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: Guidelines for reporting observational studies. *International Journal of Surgery, 12*(12), 1495–1499. https://doi.org/10.1016/j.ijsu.2014.07.013

Webber, D., Guo, Z., & Mann, S. (2013). Self-care in health: We can define it, but should we also measure it? *SelfCare, 4*(5), 101–106. Retrieved from http://selfcarejournal.com/article/self-care-in-health-we-can-define-it-but-should-we-also-measure-it/

World Health Organization. (1980). *International classification of impairments, disabilities, and handicaps: A manual of classification relating to the consequences of disease*, published in accordance with resolution WHA29. 35 of the Twenty-ninth *World Health Assembly*, May 1976. Retrieved from https://apps.who.int/iris/handle/10665/41003

World Health Organization. (2006). *The world health report 2006—Working together for health*. Geneva, Switzerland: Author. Retrieved from https://www.who.int/whr/2006/en/