

## Depression among elderly attending geriatric clubs in Assiut City, Egypt

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**Abstract: Background:** with the growth of aging population in the community, mental health problems among elderly are receiving more attention. **Aim of the study:** to investigate prevalence and risk factors associated with geriatric depression among attendants of geriatric clubs in Assiut City, Egypt. **Subjects and methods:** A cross-sectional study was conducted in two geriatric clubs in Assiut City among attendants aged 60 years and more. Trained nursing interviewers collected data through personal interview. Collected data included demographic characteristics and present medical history. Geriatric depression scale-short form (GDS-SF) was used to evaluate the depressive symptoms of the elderly subjects in the past one week. Geriatric depression was defined as a score of  $\geq 5$  on the GDS-SF. **Results:** The prevalence of geriatric depression was 25.3% in 466 participants, with a higher rate in women (29.0%) than men (20.0%). Geriatric depression was significantly associated ( $P < 0.05$ ) with: female gender, divorced/ separated marital status, lower educational level, living alone and some chronic diseases as cardiovascular disease and arthritis. On multivariate logistic regression analysis, the main risk factors for geriatric depression were: divorced/separated marital status (OR 2.29), living alone (OR 2.06), history of cardiovascular disease (OR 2.25), lower education (OR 1.67), female gender (OR 1.45) and age group 60-65 (OR 1.48). **Conclusion and recommendations:** Mental health of the elderly should receive more attention. Geriatric depression is an underestimated public health problem in our community, with women having higher prevalence than men. Establishment of integrated geriatric health care centers must be considered for primary prevention and early detection of geriatric health problems including depression.

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**Key words:** Depression-elderly-geriatric mental health- prevalence-risk factors.

### 1. Introduction

One of the main features of the Egyptian population over the last few decades is the gradual increase in the absolute and relative numbers of older people. This trend will continue over the next decades. The percent of older people, defined as 60 years of age and more, was 6.1% of the total population in 1996 and reached 7.2% in 2006 according to the last Egyptian census. The expected percentage of older people may reach 8.9% in 2016 and 10.9% in 2026. Accordingly, the expected rate of increase of total population from 1996 to 2026 is about 57% while the expected rate of increase among older people during the same period is about 79%<sup>(1,2)</sup>. These demographic trends are important for the future patterns of health care and disease<sup>(3)</sup>. This reflects the importance of providing health care for older people in Egypt.

With the growth of aging population in the community, mental health problems among elderly are receiving more attention. Older adults are more susceptible than young and middle aged adults to experience depression problems<sup>(4)</sup>.

Based on previous studies of geriatric depression in many countries, the prevalence of depressive disorders is 12.9 – 21.2% in the community

setting<sup>(5,6)</sup> and is higher for depressive symptoms, around 26.0 – 37.7%<sup>(5-8)</sup>. Major indicators that are correlated with depression are age, chronic disease, functional disability, cognitive impairment, poor social support, perceived poor health, and low income<sup>(5-9)</sup>. Numerous epidemiological studies have shown that women have a higher prevalence of depression than men across generations and cultures<sup>(9-11)</sup>. There has been a lack of studies on geriatric depression in Egypt. To provide better strategies for prevention and intervention in geriatric depression in our community exploring related issues is essential. Therefore, the present study was conducted to investigate the prevalence and risk factors associated with geriatric depression among attendants of geriatric clubs in Assiut City.

### 2. Subjects and Methods

A cross sectional study was conducted in two geriatric clubs in Assiut City, Egypt. Geriatric clubs are daycare centers in which different activities are practiced under the supervision of the organizing committees and the Ministry of Social Affairs. Attendants aged 60 years and older were invited to

participate in the study. The duration of the survey was about 4 months starting on April 2010.

All demographic characteristics; including age, sex, educational level, marital status and living arrangements were collected through personal interview by two well-trained nursing interviewers. We did not directly measure social support as a variable, but used marital status and living arrangements as proxies for social support. The living arrangements were divided into four categories: (1) living with spouse only; (2) living with children (regardless of whether living with spouse or not); (3) living with others besides spouse and children; and (4) living alone.

Four chronic diseases, diabetes mellitus, hypertension, cardiovascular disease, and arthritis, were used to assess their association with geriatric depression. Chronic disease was defined only if both self-reported answers were "yes" to (1) "have the disease" and (2) "have related treatment". Previous studies have fair agreement between self-reported history and medical records<sup>(9,12)</sup>.

#### Geriatric depression scale-short form (GDS-SF):

GDS-SF was used to evaluate the depressive symptoms of the elderly subjects in the past one week<sup>(13,14)</sup>. GDS-SF has shown good sensitivity and specificity for predicting depressive disorders in different settings<sup>(15)</sup>. The self-report scale consisted of 15 questions in a yes/no format, with total scores that ranged from 0 to 15. A cutoff value of  $\geq 5$  was used to define geriatric depression and to compare the data with other studies<sup>(5,8,9,14,15)</sup>.

#### Statistical analysis:

Statistical package for social sciences (SPSS) version 11.0 was used for data entry and analysis. Descriptive statistics (frequency and percentage) were used to present distribution of study population. Pearson's  $\chi^2$  test was used to examine significant associations between categorical variables. Multivariate logistic regression analysis was performed to identify predictors of geriatric depression. A p-value  $< 0.05$  was considered statistically significant.

### 3. Results

Among 500 attendants interviewed and invited to participate in the study, 34 refused. The response rate was 93.2%. A total of 466 attendants of the geriatric clubs participated in the study and completed the questionnaires.

More elderly women (59.2%) participated in the study. Women were more likely to be younger and of lower educational level. Most of study participants were married (72.7%) and living with children (66.1%). Women had higher frequency of diabetes and

hypertension while men had higher frequency of arthritis (Table 1).

The prevalence of geriatric depression was 25.3%. Women had a higher prevalence than men (29% vs. 20%,  $P < 0.03$ ). Age, marital status, educational level, living arrangements, cardiovascular disease and arthritis were significantly associated ( $P < 0.05$ ) with geriatric depression (Table 2).

On logistic regression analysis, the main risk factors found to be associated with geriatric depression were: female gender (OR 1.45), age group (60- < 65 years) (OR 1.48), lower education (OR 1.67), divorced/separated marital status (OR 2.29), living alone (OR 2.06), history of cardiovascular disease (OR 2.25), diabetes mellitus (OR 1.52) and arthritis (OR 1.34) (Table 3).

Table (4) presented sex differences in risk factors of geriatric depression. Divorced/separated women, living alone and those having history of arthritis or cardiovascular disease were at higher risk of depression. Regarding elderly men, the most important risk factors were divorced/separated marital status, age (60- < 65), cardiovascular disease and lower education.

Table (1): Demographic characteristics and morbidity of the studied population, Assiut city, 2010

| Variable                 | Male No. (%) | Female No. (%) | Total No. (%) |
|--------------------------|--------------|----------------|---------------|
| Total                    | 190 (40.8)   | 276 (59.2)     | 466 (100)     |
| Age (yrs):               |              |                |               |
| 60 –                     | 58 (30.5)    | 113 (40.9)     | 171 (36.7)    |
| 65 –                     | 76 (40.0)    | 120 (43.5)     | 196 (42.1)    |
| 70 +                     | 56 (29.5)    | 43 (15.6)      | 99 (21.2)     |
| Marital status:          |              |                |               |
| Married                  | 157 (82.6)   | 182 (65.9)     | 339 (72.7)    |
| Divorced/ separated      | 5 (2.6)      | 20 (7.2)       | 25 (5.4)      |
| Widowed                  | 28 (14.7)    | 74 (26.8)      | 102 (21.9)    |
| Educational level:       |              |                |               |
| Basic                    | 29 (15.3)    | 121 (43.8)     | 150 (32.2)    |
| Secondary                | 94 (49.5)    | 106 (38.4)     | 200 (42.9)    |
| University               | 67 (35.3)    | 49 (17.8)      | 116 (24.9)    |
| Living arrangements:     |              |                |               |
| With spouse only         | 51 (26.8)    | 62 (22.5)      | 113 (24.2)    |
| With children            | 116 (61.1)   | 192 (69.6)     | 308 (66.1)    |
| With others              | 10 (5.3)     | 12 (4.3)       | 22 (4.7)      |
| Alone                    | 13 (6.8)     | 10 (3.6)       | 23 (4.9)      |
| <b>Chronic diseases:</b> |              |                |               |
| Diabetes:                |              |                |               |
| Yes                      | 26 (13.7)    | 45 (16.3)      | 71 (15.2)     |
| No                       | 164 (86.3)   | 231 (83.7)     | 395 (84.8)    |
| Hypertension:            |              |                |               |
| Yes                      | 74 (38.9)    | 116 (42.0)     | 190 (40.8)    |
| No                       | 116 (61.1)   | 160 (58.0)     | 276 (59.2)    |
| Cardiovascular disease:  |              |                |               |
| Yes                      | 38 (20.0)    | 53 (19.2)      | 91 (19.5)     |
| No                       | 152 (80.0)   | 223 (80.8)     | 375 (80.5)    |
| Arthritis:               |              |                |               |
| Yes                      | 28 (14.7)    | 32 (11.6)      | 60 (12.9)     |
| No                       | 162 (85.3)   | 244 (88.4)     | 406 (87.1)    |

Table (2): Factors associated with geriatric depression among study population, Assiut city, 2010

| Variable                 | Depressive symptoms<br>No. (%) | No depressive symptoms<br>No. (%) | Total<br>No. (%) | P-value<br>( $\chi^2$ ) |
|--------------------------|--------------------------------|-----------------------------------|------------------|-------------------------|
| Total                    | 118 (25.3)                     | 348 (74.7)                        | 466 (100)        |                         |
| Gender:                  |                                |                                   |                  |                         |
| Male                     | 38 (20.0)                      | 152 (80.0)                        | 190 (40.8)       | 0.030<br>(4.805)        |
| Female                   | 80 (29.0)                      | 196 (71.0)                        | 276 (59.2)       |                         |
| Age (yrs):               |                                |                                   |                  |                         |
| 60-                      | 53 (31.0)                      | 118 (69.0)                        | 171 (36.7)       | 0.026<br>(7.313)        |
| 65-                      | 49 (25.0)                      | 147 (75.0)                        | 196 (42.1)       |                         |
| 70+                      | 16 (16.2)                      | 83 (83.8)                         | 99 (21.2)        |                         |
| Marital status:          |                                |                                   |                  |                         |
| Married                  | 74 (21.8)                      | 265 (78.2)                        | 339 (72.7)       | 0.004<br>(10.961)       |
| Divorced/ separated      | 12 (48.0)                      | 13 (52.0)                         | 25 (5.4)         |                         |
| Widowed                  | 32 (31.4)                      | 70 (68.6)                         | 102 (21.9)       |                         |
| Educational level:       |                                |                                   |                  |                         |
| Basic                    | 49 (32.7)                      | 101 (67.3)                        | 150 (32.2)       | 0.035<br>(6.701)        |
| Secondary                | 46 (23.0)                      | 154 (77.0)                        | 200 (42.9)       |                         |
| University               | 23 (19.8)                      | 93 (80.2)                         | 116 (24.9)       |                         |
| Living arrangements:     |                                |                                   |                  |                         |
| With spouse only         | 26 (23.0)                      | 87 (77.0)                         | 113 (24.2)       | 0.006<br>(12.511)       |
| With children            | 74 (24.1)                      | 234 (76.0)                        | 308 (66.1)       |                         |
| With others              | 5 (22.7)                       | 17 (77.3)                         | 22 (4.7)         |                         |
| Alone                    | 13 (56.5)                      | 10 (43.5)                         | 23 (4.9)         |                         |
| <b>Chronic diseases:</b> |                                |                                   |                  |                         |
| Diabetes mellitus:       |                                |                                   |                  |                         |
| Yes                      | 25 (35.2)                      | 46 (64.8)                         | 71 (15.2)        | 0.053<br>(4.332)        |
| No                       | 93 (23.5)                      | 302 (76.5)                        | 395 (84.8)       |                         |
| Hypertension:            |                                |                                   |                  |                         |
| Yes                      | 50 (26.3)                      | 140 (73.7)                        | 190 (40.8)       | 0.745<br>(0.168)        |
| No                       | 68 (24.6)                      | 208 (75.4)                        | 276 (59.2)       |                         |
| Cardiovascular disease:  |                                |                                   |                  |                         |
| Yes                      | 34 (37.4)                      | 57 (62.6)                         | 91 (19.5)        | 0.005<br>(8.670)        |
| No                       | 84 (22.4)                      | 291 (77.6)                        | 375 (80.5)       |                         |
| Arthritis:               |                                |                                   |                  |                         |
| Yes                      | 22 (36.7)                      | 38 (63.3)                         | 60 (12.9)        | 0.038<br>(4.687)        |
| No                       | 96 (23.6)                      | 310 (76.4)                        | 406 (87.1)       |                         |

Table (3): Multivariate logistic regression analysis for risk factors of geriatric depression among study population (n = 466)

| Variable                           | Odds ratio | 95% confidence interval |
|------------------------------------|------------|-------------------------|
| Sex, female vs. male               | 1.45       | 1.22 – 3.18             |
| Age:                               |            |                         |
| 60- < 65 (vs. 70+)                 | 1.48       | 0.99 – 2.23             |
| 65- < 70 (vs. 70+)                 | 1.27       | 0.97 – 2.06             |
| Marital status:                    |            |                         |
| Divorced/ separated vs. married    | 2.29       | 1.18 – 4.23             |
| Widowed vs. married                | 1.46       | 1.14 – 1.90             |
| Educational level:                 |            |                         |
| Secondary vs. university           | 1.19       | 0.86 – 1.91             |
| Basic vs. university               | 1.67       | 1.21 – 2.28             |
| Living arrangements:               |            |                         |
| With children vs. with spouse only | 1.04       | 0.81 – 1.73             |
| Alone vs. with spouse only         | 2.06       | 1.28 – 3.32             |
| Diabetes mellitus                  | 1.52       | 1.04 – 2.48             |
| Hypertension                       | 0.83       | 0.49 – 1.89             |
| Cardiovascular disease             | 2.25       | 1.36 – 3.72             |
| Arthritis                          | 1.34       | 0.99 – 2.17             |

OR: Odds ratio, CI: Confidence Interval

Table (4): Sex differences in risk factors of geriatric depression among study population

| Variable                           | Male (n= 190)<br>OR (95%CI) | Female (n= 276)<br>OR (95%CI) |
|------------------------------------|-----------------------------|-------------------------------|
| Age:                               |                             |                               |
| 60- < 65 (vs. 70+)                 | 1.70 (0.98 – 2.94)          | 1.17 (0.69 – 2.00)            |
| 65- < 70 (vs. 70+)                 | 1.34 (0.94 – 1.91)          | 1.10 (0.68 – 1.78)            |
| Marital status:                    |                             |                               |
| Divorced/ separated vs. married    | 2.22 (0.77 – 6.40)          | 2.67 (0.99 – 4.46)            |
| Widowed vs. married                | 1.50 (1.21 – 2.28)          | 1.18 (0.69 – 2.46)            |
| Educational level:                 |                             |                               |
| Secondary vs. university           | 1.32 (0.80 – 1.57)          | 0.83 (0.49 – 1.39)            |
| Basic vs. university               | 1.77 (1.28 – 2.45)          | 0.95 (0.67 – 1.34)            |
| Living arrangements:               |                             |                               |
| With children vs. with spouse only | 0.86 (0.63 – 2.17)          | 0.46 (0.33 – 1.17)            |
| Alone vs. with spouse only         | 1.62 (0.76 – 3.45)          | 2.32 (1.20 – 4.46)            |
| Diabetes mellitus                  | 0.95 (0.67 – 1.34)          | 1.12 (0.80 – 1.57)            |
| Hypertension                       | 1.02 (0.62 – 1.70)          | 1.10 (0.68 – 1.78)            |
| Cardiovascular disease             | 2.56 (1.38 – 4.77)          | 1.68 (0.80 – 3.49)            |
| Arthritis                          | 0.83 (0.49 – 1.39)          | 2.25 (1.36 – 3.72)            |

OR: Odds ratio, CI: Confidence Interval

#### 4. Discussion

The prevalence of geriatric depression in our study was 25.3%. There are differences between studies regarding the prevalence of depression in elderly, which probably due to the differences between communities. With the same cutoff value (GDS-SF  $\geq$  5), previous studies have shown the prevalence of depression in community elderly subjects in Taiwan to be 25.7- 27.5%<sup>(5,8)</sup>. Another study reported a lower prevalence (9.8%) and the authors described that as underestimation due to the probability of selection bias and to different demographic characteristics of study participants. They were more likely to be males, have higher education and be living with a spouse, compared to other studies<sup>(9)</sup>.

A meta-analysis done by the University of Liverpool found a 3.9% prevalence rate of depressed elderly in China<sup>(16)</sup>, compared to a 12% prevalence in Western Europe<sup>(17)</sup>. Some authors argued that reported low prevalence is faulty because of the differences in culture while others argued that the difference in cultures is the cause of low prevalence<sup>(16,18,19)</sup>.

The present study showed that the prevalence of geriatric depression was higher in women than men. Elderly women were more likely to be widows and have a lower level of education than their male counterparts, who were more likely to be older and have a history of cardiovascular disease or arthritis as their risk indicators. These findings are consistent with those of previous studies<sup>(20,21)</sup> and support the differential exposure hypothesis. Variables like past history of depression, financial difficulty and functional disability were not included for analysis, although they have shown a tendency toward a female preponderance in other studies<sup>(10,12)</sup>.

Artificial bias such as recall bias, different treatment-seeking behavior and report strategies, and co-morbid anxiety disorder have been evaluated among adult samples, but these factors could not explain the sex differences of prevalence of depression<sup>(22,23)</sup>. That is, depression is indeed more common in women. Further studies are needed to clarify the issue of artificial bias in studies of depression in elderly people.

Regarding the age group (60- < 65), the elders at this age start to change their lives. They retire and suffer from shrinkage of their social activities and their roles. In Egypt, there is shrinkage in the role of elderly men more than elderly women after the age of 60. This is not seen in elderly above 70 years as they accommodate their lives.

Divorced/ separated marital status was associated with geriatric depression in both sexes and in the overall sample as well. This has also been confirmed in previous studies<sup>(3,9,24)</sup>. The current study showed that widowhood was associated with depression in both sexes. The result is consistent with other studies in Western countries and Hong Kong<sup>(25-27)</sup> but differs from others in China and Taiwan<sup>(9,28)</sup>. A follow-up study in China found that support from children protects widowed parents against the adverse effects of spousal death, and a sex difference in the effect of widowhood on depression was not evident<sup>(28)</sup>. However, further analysis of our data revealed that among participants who lived with children, widowed men were still more depressed than those who were married (11.5% vs. 6.2%,  $P < 0.05$ ), while widowed women were not (14.4% vs. 11.6,  $P = 0.12$ ) (data not shown). This finding implies that social support from children is probably less protective against late-life depression for widowed men than women. Further studies with a prospective design and direct

measurement of different types of social support are needed to clarify the causality between social support and depression.

In the current study, being elderly and living alone was associated with depression in overall sample, with women at higher risk of having depression due to loneliness. This is in line with other studies in Taiwan & China<sup>(9,29)</sup> Being elderly and living alone in Western countries is associated with higher income and autonomy, and is not necessarily linked to depression<sup>(30)</sup>. In contrast, elderly women living alone in our community are prone to financial difficulties, have poor social support, and suffer more chronic disease all of which are also highly associated with late-life depression<sup>(24)</sup>.

The association of arthritis and depression has been documented<sup>(31-32)</sup>. Clinical samples of osteoarthritis in Taiwan imply that sex, mediated through a depressive tendency, predicts pain intensity and pain disturbance<sup>(33)</sup>. There is also evidence that pain predicts depression in patients with rheumatoid arthritis<sup>(34)</sup>. Furthermore, different coping strategies between the sexes might play a role. The emotional expression of a painful experience is more socially acceptable in women than in men<sup>(34)</sup>. This difference is more apparent in the culture of Upper Egyptian patients, especially the elderly. These factors could partly explain why elderly men have a higher prevalence of arthritis than women, but are less depressed.

The present study has some limitations. First, the cross-sectional design prevents clear causal inferences between geriatric depression and related risk indicators. Second, since the participants were limited to attendants of geriatric clubs in Assiut city, whether the conclusion apply to elderly people elsewhere (e.g. rural) needs further confirmation. Third, there were no data on variables such as past history of depression, financial difficulty and functional disability, which would provide a more comprehensive picture. Fourth, GDS-SF is a screening tool for depressive symptoms, rather than a diagnostic instrument for depressive disorders. Those screened as positive should receive further evaluation. Nevertheless, geriatric mental health receives poor attention in our community, and this explains the deficiency in Egyptian studies that investigate this issue. Understanding how to prevent depression in elderly people in our community will serve to improve some of the problems that may come in caring for the well-being of the elderly and their families.

In conclusion, women have a higher prevalence of geriatric depression than men. Living alone, lower education, divorced and widowed marital status, age group 60-65 and chronic diseases as cardiovascular

disease, diabetes mellitus and arthritis are independent risk factors for geriatric depression.

Mental health problems among the elderly should receive more attention. The findings of the present study reflect the importance of providing mental health care for elderly in Egypt. Establishment of integrated geriatric health care centers must be considered for primary prevention and early detection of geriatric health problems including depression.

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