Original Article

Prevalence and Factors Associated with Depression in Older Adults in Tabriz, Iran: Data from the Health Status of Aged People in Tabriz (HSA-T Study)

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Abstract

Objectives: To determine the prevalence of depression and identify the factors predicting depression among older people.

Design: Cross-sectional study.

Setting(s): Tabriz, the capital city of the East Azerbaijan Province in northwestern Iran.

Participants: A representative sample of ≥60 years who were not institutionalized participated in this study. A total of 1071 participants (514 males and 557 females) were selected using the probability proportional to the size (PPS) sampling method.

Outcome measures: Depression, perceived social support, socioeconomic status (SES), and life satisfaction were assessed using the Multidimensional Scale of Perceived Social Support (MSPSS), Hospital Anxiety and Depression Scale (HADS), Socioeconomic Status Questionnaire for Urban Households (SES Iran), and the Satisfaction with Life Scale (SWLS), respectively.

Results: Depression was highly prevalent among Iranian older adults, and more than 77.0% (95% confidence interval (CI: 0.75-0.80) of the participants suffered from some level of depression. In addition, the prevalence of depression was significantly higher among women (85.0% vs. 70.0%, $P<0.001$). Furthermore, being female, older age, lower levels of physical activity, lower perceived social support, and lower life satisfaction were all associated with depression severity.

Conclusions: The high prevalence of depression among older people in Iran and the significant role of social factors highlight the need to use a multidimensional approach when developing interventions to reduce depression among older adults.

Keywords: Social determinants of health, Non-communicable diseases, Aging, Depression, Social support

Introduction

As with other parts of the world, the number of older people in Iran is increasing. At present, more than 10% of the population in Iran is at least 60 years old, and this figure will grow to about 33% by 2050.[1] Depression is a major public health problem and the most common emotional disorder among older adults.[2, 3] Moreover, the global incidence of depression increased by 45% from 1990 (172 million) to 2017 (258 million).[4] However, the prevalence of depression varies by country, and it was found to be about 20% in western countries,[5] 28% in Sri Lanka,[6] and more than 60% among Iranian older adults.[7] Globally, depression accounts for the largest proportion of non-fatal health loss. The World Health Organization (WHO) has ranked unipolar depression as the 3rd largest cause of disability worldwide (4.3% of total Disability Adjusted Life Years), and it is projected that it will be the leading cause by 2030.[8] As a country in transition, Iran is currently experiencing a rapid increase in the burden of non-communicable diseases, including mental disorders.[9] Epidemiological studies have found that many demographic and biopsychosocial factors are associated with depression,

including gender,[2, 7, 10, 11] age,[7, 10] marital status,[10, 11] physical activity,[12-15] low education,[7, 11] socioeconomic status (SES), social networks,[16] and perceived social support.[3, 16, 17] As the population of older people is growing fast, it is crucial to understand the factors that may influence depression among older adults. Thus, the current research aimed to investigate the prevalence of depression and identify the factors associated with depression among older people in Tabriz, Iran.

Methods
This study was embedded within the Health Status of Aged people in Tabriz (HSA-T) study, which was conducted on a representative sample of non-institutionalized older people (≥ 60 years) in Tabriz, Iran.

Study Setting
The study was conducted in Tabriz, which is in the East Azerbaijan Province of Iran, from June 2015 to August 2015. The East Azerbaijan Province is in the northwest of Iran, and Tabriz is both the capital of the region and the most populated city.[18] The majority of the city's inhabitants are Iranian Azerbaijanis, and the most common language is Azeri Turkish. According to the last Iranian census data, the total population of those aged 60 and older is about 180000 (around 10.5% of the city's population).[18]

Study Population
This study used a cross-sectional design, and the population included all community-dwelling people aged 60 and above who were living in Tabriz.

Sample Size and Sampling Method
Details on this descriptive cross-sectional study and the sampling methodology have been described elsewhere. [19] In brief, the statistical population included all people aged 60 years and older who lived in the community. A community-based representative sample of 1071 older adults was randomly selected using the probability proportional to the size sampling method. In the first stage, 107 blocks were randomly selected from the 8531 urban blocks in Tabriz. Following this, 10 older adults were then randomly selected from each of the selected city blocks. Of the 1071 cases in the original study, data related to depression was available for 1060 (512 men and 548 women).

Data Collection Tools
The data collection was undertaken by trained interviewers using questionnaires that measured demographic information as well as the scales described below.

Hospital Anxiety and Depression Scale
Depression was assessed using the Hospital Anxiety and Depression Scale (HADS). HADS is a commonly used measure of emotional distress that has been found to adequately measure the severity of anxiety and depression symptoms in primary healthcare as well as in the general population. Although this scale was developed for use in hospital settings, it is also a valid and reliable method of screening mental morbidity in community settings. [20] Furthermore, the Iranian version is an appropriate, reliable, and valid measure of anxiety and depression among older adults.[21] HADS has two subscales: the first measures depression, and the second gauges anxiety. The questions are answered using a 4-point Likert-type scale (0 to 3), which produces a total HADS score of 0 to 42 points. Each subscale has a score ranging from 0 to 21, with higher scores indicating more severe symptoms. In the current study, only the depression subscale data were analyzed. In terms of categorizing the answers, non-depressed individuals had scores between 0-7, while the remainder were classified as mild depression (score 8-10), moderate depression (11-14), and severe depression (15-21).[20]

Multidimensional Scale of Perceived Social Support
The Multidimensional Scale of Perceived Social Support (MSPSS) was used to measure the perceived level of social support, which is received from family, friends, and significant others. This tool was developed by Zimet et al [22] and contains 12 questions that are answered on a 7-point Likert scale (1 = very strongly disagree to 7 = very strongly agree). The sum of all 12 items represents the overall level of perceived social support, with lower scores indicating a lower level of social support. The validity and reliability of MSPSS have been evaluated favorably in Iran.[23]

Socioeconomic Status Questionnaire for Urban Households
The SES Questionnaire for Urban Households (SES Iran), which has acceptable validity and reliability, was developed for use in Iran. The scale is frequently included in many health surveys or clinical studies, as well as research on health equity and economics.[24]

Satisfaction with Life Scale
The Satisfaction with Life Scale (SWLS) was used to evaluate satisfaction with life. The scale was designed by Diener et al and has been found to have good reliability and validity.[25] The SWLS contains five items that are answered using a 7-point Likert scale (strongly dissatisfied to strongly satisfied). The Persian SWLS has also been found to have good validity and reliability.[26]

Statistical Analysis
Kolmogorov–Smirnov tests were used to test for normality ($P > 0.05$). Descriptive data were presented as frequencies (and percentages) for categorical data and means (and standard deviations) for continuous variables. Moreover, independent Samples t-tests were used to compare the means of two independent groups, and the analysis of variance (ANOVA) tests was employed when there were more than two independent sub-groups. Furthermore,

ordinal regression was used to determine the predictors of depression among older adults. All statistical analyses were conducted using SPSS23, and the level of significance was set at $P < 0.05$.

Results

The mean age of the participants was 70.19 years old. The highest proportion of participants was married, and the lowest proportion had never been married. More than 54% were illiterate (unable to read or write), and more than half were born in rural areas and then migrated to Tabriz. In terms of the type of family, almost 58% were living in extended families, followed by nuclear families and living alone as the second and third most common type of family. Families with 3-5 members were the most common household size (46.3%).

The distribution of depression status is presented in Table 1. The results revealed that only 22.4% of older adults were not depressed, while most of the remaining participants suffered from varying levels of depression. About 15% had severe depression, and more than 36% suffered from a moderate level of depression.

Gender, age, education, place of birth, marital status, perceived social support, and satisfaction with life were all associated with the HADS depression subscale scores (Table 2). The prevalence of depression in women was significantly higher than that among men. Furthermore, women were more likely to suffer from depression, and only 15.5% of women were depression-free, while 29.7% of men were not depressed.

A multivariate analysis of the factors related to the severity of depression (i.e., gender, age, SES, perceived social support, marital status, daily walking, and life satisfaction) was undertaken using ordinal regression. The results of this analysis demonstrated that the severity of depression among participants was significantly associated with sex, physical activity, life satisfaction, and perceived social support. Therefore, our results indicate that older age, being a woman, engaging in lower levels of physical activity, low life satisfaction, and a perceived lack of social support were positively associated with depression in older adults. Furthermore, the ordinal regression demonstrated that being female, being older, being single, having low levels of walking and physical activity, having low levels of perceived social support, and having low life satisfaction can significantly increase the

Table 1. Different Levels of Depression in the Community-Dwelling Older Adults

Depression Status	Frequency	Percent	95% CI
Normal	237	22.4	19.9-24.9
Mild	389	36.7	33.9-39.6
Moderate	276	26.0	23.5-28.8
Severe	158	14.9	12.9-17.2
Total	1060	100.0	

Note. CI, confidence interval.

severity of depression.

As Table 3 depicts, by decreasing the level of life satisfaction from extremely satisfied to satisfied, neutral, dissatisfied, and extremely dissatisfied, the severity of depression progressively increased (B = 0.42, B = 0.81, B = 1.60, and B = 2.40, respectively). In addition, compared with the "very much satisfied" perceived level of social support, the lower levels (i.e., much, average, low, and very low levels) all resulted in higher levels of depression (B = 0.56, B = 0.91, B = 1.70, and B = 0.70, respectively). In addition, low SES was associated with higher severe depression (Table 3). However, SES did not significantly increase the severity of depression (B = -0.01 and $P = 0.06$).

Discussion

The current study aimed to determine the prevalence of depression as well as the factors related to depression among community-dwelling adults aged 60 and older who were living in northwest Iran. This study found a high prevalence of depression among this group, with more than 77% suffering from some degree of depression. However, it should be noted that the measurement of depression was based on a self-report scale, not on a clinical examination. A depression symptom questionnaire is not designed to ascertain the diagnostic status of an individual, and based on its specificity and sensitivity estimates, we would expect this scale to overestimate the prevalence of depression.[27]

The depression burden is also affected by the stigma and public beliefs regarding depression. Depressed people may refuse to receive help and treatment because of the stigma attached to mental disorders. The stigmatized person is not considered competent enough to be fully accepted in society.[28] The stigma attached to depressed individuals is one of the barriers to improving their mental condition and is so important to the burden of the disease that the WHO has described the stigmatization of depression as the "hidden" burden of the disease.[29] Developing campaigns to reduce the stigmatization of depression and promote public health literacy can help reduce the burden caused by depression. This study also identified several factors that are associated with depression.

Gender and Depression

It should be noted that sex-related differences in mental disorders differ according to the country and other social contexts. The factors that can help with interpreting these differences include cultural and social norms, as well as differences in the gender roles and coping strategies of men and women.[30] In our study, being male significantly decreased the severity of depression. However, although several studies were in line with our findings[2, 7, 31] and have found female gender to be a significant predictor of depression,[11, 16] other studies have found no relationship between depression and gender.[32] This discrepancy is most likely due to the numerous potentially confounding social and economic factors.[33] Therefore, the gender difference found in the prevalence of depression in the current

Table 2. Depression and Socio-demographic Characteristics of the Community-dwelling Older Adults

Characteristics		Normal No. (%)	Mild No. (%)	Moderate No. (%)	Severe No. (%)	Total No. (%)	P Value*
Sex	Male	152 (64.1)	194 (49.9)	112 (40.6)	54 (34.2)	512 (48.3)	<0.001
	Female	85 (35.9)	195 (50.1)	164 (59.4)	104 (65.8)	548 (51.7)	
Age	60-69	140 (59.1)	199 (51.2)	130 (47.1)	69 (43.7)	538 (50.8)	
	70-79	77 (32.5)	132 (33.9)	95 (34.4)	49 (31.0)	353 (33.3)	<0.001
	≥80	20 (8.5)	58 (14.9)	51 (18.5)	40 (25.4)	169 (16.0)	
Marital status	Single	40 (16.9)	101 (26.0)	101 (36.6)	56 (35.4)	298 (28.1)	
	Married	197 (83.1)	288 (74.0)	175 (63.4)	102 (64.6)	762 (71.9)	<0.001
Birth place	Village	108 (45.6)	169 (43.4)	162 (58.7)	107 (67.7)	546 (51.5)	
	Town	129 (54.4)	220 (56.6)	114 (41.3)	51 (32.3)	514 (48.5)	<0.001
Kind of family	Alone	19 (8.0)	37 (9.5)	40 (14.5)	23 (14.6)	119 (11.2)	
	Nuclear	74 (31.2)	136 (35.0)	66 (23.9)	43 (27.2)	319 (30.1)	0.015
	Extended	144 (60.8)	216 (55.5)	170 (61.6)	92 (58.2)	622 (58.7)	
Educational level	Illiterate	73 (30.8)	188 (48.3)	187 (67.8)	126 (79.7)	574 (54.2)	
	Primary	86 (36.3)	115 (29.6)	64 (23.2)	24 (15.2)	289 (27.3)	
	Secondary	49 (20.7)	54 (13.9)	19 (6.9)	7 (4.4)	129 (12.2)	<0.001
	Higher education	29 (12.2)	32 (8.2)	6 (2.2)	1 (0.6)	68 (6.4)	
Walking	No walk	29 (12.3)	78 (20.5)	93 (34.4)	66 (41.8)	266 (25.5)	
	About 15 min	42 (17.8)	114 (30.0)	77 (28.5)	55 (34.8)	288 (27.6)	
	About 30 min	81 (34.3)	115 (30.3)	57 (21.1)	25 (15.8)	278 (26.6)	<0.001
	About 60 min	84 (35.6)	73 (19.2)	43 (15.9)	12 (7.6)	212 (20.3)	
PSS	Very low	3 (1.3)	8 (2.1)	9 (3.3)	11 (7.0)	31 (2.9)	
	Low	9 (3.8)	44 (11.3)	62 (22.5)	71 (44.9)	186 (17.6)	
	Average	8 (3.4)	21 (5.4)	17 (6.2)	12 (7.6)	58 (5.5)	<0.001
	Much	147 (62.0)	215 (55.4)	164 (59.4)	60 (38.0)	586 (55.3)	
	Very Much	70 (29.5)	100 (25.8)	24 (8.7)	4 (2.5)	198 (18.7)	
SES	Very Low	83 (35.0)	187 (48.2)	192 (69.6)	117 (74.1)	579 (54.7)	
	Low	93 (39.2)	145 (37.4)	67 (24.3)	36 (22.8)	341 (32.2)	
	Middle	46 (19.4)	44 (11.3)	15 (5.4)	3 (1.9)	108 (10.2)	<0.001
	High	11 (4.6)	8 (2.1)	2 (0.7)	2 (1.3)	23 (2.2)	
	Very High	4 (1.7)	4 (1.0)	0 (0.0)	0 (0.0)	8 (0.8)	
Life Satisfaction	Extremely dissatisfied	4 (1.7)	37 (9.5)	42 (15.3)	57 (36.1)	140 (13.2)	
	Dissatisfied	40 (16.9)	138 (35.5)	137 (49.8)	78 (49.4)	393 (37.1)	
	Neutral	26 (11.0)	58 (14.9)	33 (12.0)	2 (1.3)	119 (11.2)	<0.001
	Satisfied	141 (59.5)	139 (35.7)	60 (21.8)	21 (13.3)	361 (34.1)	
	Extremely satisfied	26 (11.0)	17 (4.4)	3 (1.1)	0 (0.0)	46 (4.3)	

Note. PSS, perceived social support; SES, socio-economic status; * P value calculated by chi-square test.

study might be due to social constraints, prejudices, and stereotyped beliefs about women in Iran. Nevertheless, there is no clear evidence that the prevalence of depressive disorders is higher in countries where women have a lower status than men compared with countries where women are more equal. However, several physiological, psychological, and sociological mechanisms have been proposed to explain the higher prevalence of depression among women, but the underlying mechanisms remain unclear.[34] Therefore, more research is needed on the reasons for sex differences in depression.

Physical Activity and Depression

We found the prevalence and severity of depression to have a significant negative relationship with daily physical activity and walking. Several other studies have reported similar findings.[12-15, 35] Previous studies have demonstrated a lower level of depression among older people who are physically active than among their peers who are not physically active, so the provision of desirable venues for engaging in sports and socializing could help improve mental health.[12, 13] There is extensive evidence that regular physical activity is an effective primary and secondary prevention technique for several chronic diseases,

Table 3. Ordinal Regression Analysis of the Relationship between Depression and the Risk Variables

Variables	B	95% CI	*P* Value
Gender			
Male	-0.03	-0.56 to -0.04	0.022
Female	0.00		
Age	0.02	0.00 to 0.03	0.044
Marital status			
Single	0.14	-0.16 to 0.44	0.353
Married	0.00		
Walking			
No walk	1.07	0.69 to 1.45	<0.001
≤15 mins	0.80	0.45 to 1.16	<0.001
15-30 mins	0.42	0.08 to 0.80	0.017
≥60 mins	0.00		
Satisfaction with life			
Extremely dissatisfied	2.40	1.66 to 3.14	<0.001
Dissatisfied	1.60	0.93 to 2.26	<0.001
Neutral	0.81	0.10 to 1.51	0.025
Satisfied	0.42	-0.22 to 1.05	0.200
Extremely satisfied	0.00		
Perceived social support			
Very Low	0.70	-0.06 to 1.45	0.070
Low	1.70	1.28 to 2.18	<0.001
Average	0.91	0.35 to 1.48	0.002
Much	0.56	0.24 to 0.89	0.001
Very Much	0.00		
SES	-0.01	-0.02 to 0.00	0.066

Note. CI, confidence interval; SES, socio-economic status.

including cardiovascular disease, diabetes, cancer, hypertension, obesity, depression, and osteoporosis.[15] Routine physical activity has also been associated with improved psychological well-being by reducing stress, anxiety, and depression.[14]

While physical activity can be a lifesaver for aging people generally, old age is associated with a decrease in physical activity. Physical activity is one of the modifiable factors that reduce the risk of depression. Reducing sedentary activities such as daytime napping and TV watching could help lower the risk of depression. Therefore, policymakers must design programs to increase Iranian older adults' physical activity. Furthermore, launching public walking programs in different neighborhoods may also be helpful. In addition, the adaptation of urban pathways and furniture based on the physical conditions and needs of older people (age-friendly cities and communities) can help encourage physical activity in older adults.

Perceived social support and Depression
We found that the MSPSS scores were negatively associated with depression. Low perceived social support was one of the main predictors of depression, which is consistent with previous research.[3, 16, 17, 36, 37] Social support is thought to be one of the social determinants of overall health and is an essential factor in the course and outcome of psychopathological disorders. People with a higher level of social support have a better general health status, and social support can decrease depression and improve the quality of life.[38] Furthermore, low subjective social support is a significant predictor of depression and is associated with major depression.[39] A similar study found that depressive symptoms significantly decrease with improved family support.[37] Moreover, research has found that the self-rated level of perceived support was significantly associated with the HADS score.[36] In addition, the research found social support to be a mediator in the relationship between the mental health quality of life and depression symptoms among older African American grandmothers.[40]

There are several factors affecting perceived social support, one of which is an individual's level of social connection. The relationship here is direct and significant. Perceived social support is a mechanism that explains how social ties promote health.[41] More social relations are likely to increase perceived social support, which promotes health. An individual with a more significant number of ties has more trustworthy people with whom they can connect and receive social support and health-relevant information.[41] Social connection is one of the protective factors against depression. Policymakers must encourage social interactions among older adults in Iran. An active social life improves physical, mental, and emotional health, which are all particularly important for older adults struggling with depression. Visiting friends, relatives, and extended family members, taking part in group outings, and attending community events can reduce depression in older adults. The continuation of social contact in old age is extremely important. Online social participation can also be helpful to maintain offline social participation for those whose face-to-face social activity has been limited due to mobility limitations.[42]

Life Satisfaction and Depression
It was found that life satisfaction had significant negative relationships with both the prevalence and severity of depression. The findings of this study are consistent with previous research. People with a high level of life satisfaction have a better mental health status. Happiness is one of the mental factors that affect the prevalence and severity of depression.[43] Furthermore, life satisfaction and depressive symptoms are two factors that independently affect adult mortality.[44] There is also evidence that people fulfilling the criteria for major depressive disorders have lower levels of life satisfaction.[45]

Socio-economic Status and Depression
the findings demonstrated that low SES is not associated with a higher prevalence of depression. There is considerable evidence of the higher prevalence of depression among older adults living in low socioeconomic conditions.[46] SES is associated with the prevalence of depression, [47] and there are remarkable differences in the prevalence of depression among people with different SES levels.[48] Although it was not significant in this study, paying attention to the socio-economic factors is also important for addressing depression in older adults.

Marital Status and Depression
The rate of depression was significantly higher among

older adults who were single. However, ordinal regression found no significant relationship between marital status and the severity of depression. According to other studies, being single is a significant risk factor for depression.[11, 35] It is possible that being married applies its regulating effect through the spouse's social support, which reduces depression among their spouse.

Education and Depression

The findings revealed a significant negative relationship between the level of education and the prevalence and severity of depression, which is in agreement with previous research.[31, 35] Low education has been found to be independently associated with an increased risk of depressive symptoms.[7] In an epidemiological study, the lowest educational group had a higher prevalence of psychiatric morbidity.[49] However, further research has revealed that a higher academic level predicts higher depressive symptoms.[50]

Study Limitations

This study has several strengths, including the sample size and representative sample. However, the present study suffers from a number of limitations. As with other cross-sectional studies, the inability to make causal inferences is one important limitation. In addition, using a self-report scale, instead of measuring depression using the gold standard approach, is another limitation that may have led to overestimating the prevalence of depression.

Conclusions

We found depression to have a high prevalence among older Iranian people and that social factors played a significant role in predicting depression. Old age coincides with an optional or obligatory disconnection from occupational and social situations. Furthermore, the reduction in social and occupational interactions and changes in the family structure mean that aged people are an isolated population. Therefore, addressing mental disorders and social health factors among aged people should be considered a priority, and help should be provided to encourage the development of appropriate social networks, which will help improve and promote older adults' health.

Author Contributions

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All authors have read and agreed to the published version of the manuscript.

Data Availability Statement

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Ethical Approval

This study was reviewed and approved by the Deputy of the Research Ethics Committee at the Tabriz University of Medical Sciences (Ethical ID: TBZMED.REC.1394.1069). Informed consent was obtained from all participants, and they were assured of the confidentiality of all provided information.

Consent for Publication

Not applicable.

Conflict of Interests

The authors declare that they have no conflict of interests.

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