ORIGINAL ARTICLE

Depression in adult day care centers in Ecuador: Prevalence and associated variables

Depresión en adultos que asisten a los centros de día en Ecuador: Prevalencia y variables asociadas

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Abstract

Objectives: The present study aims to identify the prevalence and factors associated with depression in older adults attending day care centers in Quito, Ecuador.

Methods: This study is a correlational study with a non-experimental cross-sectional design. The study was applied in the 8 "Centros de Experiencia del Adulto Mayor" in the city of Quito, Ecuador. A total of 463 older adults with a mean age of 70.15 years were evaluated. All participants were administered a sociodemographic and health questionnaire, cognitive functioning, levels of depression, autonomy, and physical activity were measured.

Results: Using linear regressions, direct relationships were identified between depression scores with marital status (B=0.276, p=0.04) and renal impairment (B=1.257, p=0.007); and inverse relationships with educational level (B=-0. 537, p=0.002), sleep hours (B=-0.342, p<0.001), fish consumption (B=-0.318, p=0.021), physical activity (B=-0.454, p=0.002) and cognitive impairment (B=-0.091, p<0.001).

Conclusions: The results reflect the importance of considering a holistic approach in addressing depression in the older adult, including health, functional status and cognitive status together to prevent and or address depression in older adults. This study contributes to the implementation of public health policies related to the variables associated with depression in adults.

Keywords: depression, elderly, cognitive impairment, functional autonomy, day care center

Resumen

Objetivos: El presente estudio tiene como objetivo identificar la prevalencia y los factores asociados a la depresión en adultos que asisten a centros de día en Quito, Ecuador.

Métodos: Es un estudio correlacional con un diseño transversal no experimental. El estudio se aplicó en los 8 "Centros de Experiencia del Adulto Mayor" de la ciudad de Quito, Ecuador. Se evaluaron 463 adultos con una edad promedio de 70,15 años, se administró un cuestionario sociodemográfico y de salud, se midieron el funcionamiento cognitivo, los niveles de depresión, la autonomía y la actividad física.

Resultados: mediante regresiones lineales, se identificaron relaciones directas entre las puntuaciones de depresión con el estado civil (B=0,276, p=0,04) y la insuficiencia renal (B=1,257, p=0,007); y relaciones inversas con nivel educativo (B=-0. 537, p=0.002), horas de sueño (B=-0.342, p<0.001), consumo de pescado (B=-0.318, p=0.021), actividad física (B= -0,454, p=0,002) y deterioro cognitivo (B=-0,091, p<0,001).

Conclusiones: Los resultados reflejan la importancia de considerar un enfoque holístico en el abordaje de la depresión en el adulto mayor, incluyendo la salud, el estado funcional y el estado cognitivo en conjunto para prevenir y/o abordar la depresión en los adultos mayores. Este estudio contribuye a la implementación de políticas públicas de salud relacionadas con las variables que se asocian a la depresión en el adulto.

Palabras clave: depresión, adulto mayor, deterioro cognitivo, autonomía funcional, centro de cuidado diurno

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Introduction

Depression is a major public health problem affecting more than 120 million people worldwide.[1] It is the leading cause of global disability and a major contributor to the global burden of disease.[2,3] Depression affects the person suffering from it, their caregivers and family members, as well as society as whole.[2,4] It is responsible for a significant increase in healthcare costs across the globe.[2,5-7]

The elderly are particularly vulnerable to the impact of depression, which leads to a greater risk of disability and death in that population.[8] Starting at age 65, people with major depressive disorder lose an approximate 13.8 years of quality of life.[9] Depression is also associated with excess mortality in the elderly living in low- and middle-income countries.[10] Furthermore, depression in the elderly has a poor prognosis, may be undertreated and perhaps chronic or relapsing,[11] necessitating comprehensive and tailored intervention strategies.

Prevalence of depression peaks in in older adulthood, reaching above 7.5% among females aged 55-74 years, and above 5.5% among males.[12] The prevalence of depression in population older than 65 years is estimated to be up to 39% in some studies.[13,14] Furthermore, Meeks et al.[15] reported that subclinical depression, i.e., the presence of depressive symptoms that fail to meet all criteria for depression in older adults is 2 to 3 times higher than the disease itself, and within this group approximately 10% go on to develop major depression.

There are several socio-demographic, cognitive, functional and health factors in older adults found to be associated with depressive symptoms, including gender, exercise, diet, marital status, educational level, sleep, cognitive ability, functional autonomy, and the presence of medical illnesses such as kidney damage.[16-18] Lifestyle variables such as physical exercise or diet are highlighted by the WHO as promoters of healthy aging.[12] However, 35.5% of adults over 75 years-old are inactive.[19] Studies have established a relationship between lower frequency of physical exercise in older adults and a higher presence of depression diagnosis.[20] Diet is another variable that has been identified as a preventive factor for depression.[21,22] The prevalence of insomnia among the elderly is approximately 50%,[23] which is an elevated risk in this age group.

Higher levels of education have been shown to be associated with a lower presence of depressive symptoms.[24] Some studies also show that marriage may have a protective role, given that in some cases it may be associated with psychosocial resources, especially during stressful life events.[25] The loss of a spouse or divorce may be stressful life circumstances that increase the risk of older people suffering from depression.[26] Other health problems such as diabetes, kidney damage, liver damage or cardiovascular issues have shown incidence in the presence and severity of depression in older adults.[16] Finally, cognitive impairment is one of the most studied variables in relation to depression. Several investigations point out that cognitive impairment triggers the development of depression and aggravates its symptomatology.[18,27,28] In turn, loss of functional autonomy has been associated with an increased tendency to social isolation and loss of functionality in activities of daily living, which could increase feelings of worthlessness and impact the development of depression.[29]

Even though depression in the adult population is an important public health problem, systematic research on its prevalence and determinants remains scarce, especially in middle- and low-income countries.[30] Furthermore, there are few studies in Latin America that consider the impact of multiple demographics, clinical, cognitive, and lifestyle variables on depression.[31] Therefore, the aim of this study is to identify the prevalence and variables associated with depressive symptoms from functional, socio-demographic, cognitive, and clinical dimensions in older adults in a day care center.

Materials and methods
Participants

For the present study data was collected from 690 participants recruited in eight municipal elderly care centers in the city of Quito, Ecuador. Of the initial sample, 240 were excluded because they had a clinical history of psychiatric pathologies (major depression, schizophrenia, bipolar disorder) and 20 more participants were excluded because they were unable to take the tests due to visual and hearing difficulties or disabilities that made their participation impossible. The final sample consisted of 463 people ranging in age from 45 to 91. Most of the participants were women (82%). Descriptive statistics for all sociodemographic and clinical variables can be found in Table 1.

Procedure

Participants considered older adults based on self-identification rather than the standardized age criterion of 65 years or older, were recruited from eight municipal day care centers in Quito, Ecuador, between September 2019 and February 2020. Center directors were approached and informed of the study, who in turn communicated this information to the center participants. Those who showed interest in participating were further educated about the study and informed consent was obtained prior to administration of the study protocol. Test administration lasted approximately 30 minutes and included the instruments detailed below. This study was approved by the Human Research Ethics Committee, CEISH-USFQ.

Instruments

The geriatric depression scale (GDS) abbreviated format accord Yesavage and Sheikh[32] was used as a measure of depression. This scale consists of 15 items whose responses are dichotomous (yes/no), and the score can range from 0 to 15 points. A score greater than or equal to 5 indicates depressive symptomatology. This scale has been shown to have a high correlation with the original version (r=.84, p< .001).[32] For this study, the presence of depression was defined as scores greater than or equal to 5.

The Montreal Cognitive Assessment (MoCA) scale by Nasreddine et al[33] was used to assess cognitive functioning in older adults. This scale measures eight cognitive domains: executive function, visuospatial ability, memory, attention, concentration and working memory, language and orientation. A score of 0-30 can be obtained. There are many studies indicating psychometric quality,[34] reflecting in Mexican population high validity to discriminate MCI and Alzheimer's (sensitivity=80% and specificity=75% for MCI) and (sensitivity=98% and specificity=93 for Alzheimer's).

The Barthel scale[35] was used as a measure of functional assessment of the elderly, allowing the degree of dependence of an adult in activities of daily living to be observed. It is composed of 10 items whose score varies between 0-100. The closer to 100, the greater the level of independence. This scale has shown adequate validity in both sensitivity and specificity (>75%).[36]

To assess physical activity, the International Physical Activity Questionnaire (IPAQ)[37] was used. This is a 7-question questionnaire on the frequency, intensity and duration of physical activity performed on a regular basis, establishing 3 levels of mild, moderate and high activity. This questionnaire has shown to have adequate psychometric properties, high reliability around 0.8 and reasonable concurrent validity (r = 0.67; 95 % CI: 0.64-0.70) between the two versions.[38]

Finally, a Sociodemographic and Clinical Questionnaire was applied, which collects information on level of education, area of residence, marital status, hours of sleep, fish consumption, history of alcohol consumption, history of medical or psychiatric illnesses, presence of disability and consumption of medications.

Data analysis

In the initial analysis, descriptive statistics for each of the dependent variables were obtained. Prevalence of depression across the sample were calculated using a cutoff point of 5 points in the GDS scale. Assumptions of multiple linear regression models were tested. For normality and homoscedasticity, a graphical analysis was conducted. Independence was tested by Durbin-Watson statistic (DW=2.1). To assess for multicollinearity, tolerance (between 0.63 and 0.99 for all variables), and variance inflation factors (VIF between 1 a 1.6 for all variables) were examined. The results of these preliminary analyses indicated no evidence suggesting these assumptions had been violated. The significance of the dependent variables for the GDS scores were calculated by linear regression using the enter and stepwise methods. Finally, adjusted R squared was calculated to know the proportion of variance explained by the model and η2par was obtained to assess the individual contribution of each independent variable. SPSS 23 was used in statistical analysis. Descriptive statistics were used to characterize the sample.

All variables described in Table 1 were used as predictors of GDS scores in an initial linear regression analysis. The variables that were not significant were taken out of the model and the regression was ran again. All analyses will be performed using the R statistical program.[39]

Results

Descriptive statistics for sociodemographic variables, MOCA and GDS scores can be found in Table 1. Of the total sample, 223 older adults, equivalent to 34% presented with depression.

All sociodemographic and clinical variables described in Table 1 were used as predictors of the GDS scores using the enter and stepwise methods of linear regression analysis. Both results can be found on Table 2. The stepwise method of multiple linear regression analysis showed that MoCA Full (B=-,079; p=,001; η2par=-,129), Barthel (B=-,056; p<,001; η2par=-,159), hours of sleep (B=-,36; p<,001; η2par=-,207), education (B=-,079; p=,012;η2par=-,096), fish intake (B=-,358; p=,021;η2par=-,088), renal problems (B=1,339; p=,005; η2par =,108), and exercise (B=,415; p=,004; η2par=,111) are statistically significant and accounted for the largest portions of the variance. The final model presents an adjusted r squared of 0.185 explaining the 18.5% of the GDS variance.

The variables MoCA Full, Barthel, hours of sleep, education, fish intake and exercise have an inverse relationship with GDS scores and could therefore be considered protective factors against depression in the elderly. The results suggest that the risk of presenting geriatric depression is higher in people with renal damage, which could be a risk factor. Of the predictors, the ones that provide the most information to the model are hours of sleep (η2par=-,207), Barthel (η2par=-,159) and MoCA FULL (η2par=-,129).

Table 1. Sociodemographic and clinical variables.

Variable	Mean	SD	Min.	Max.
MoCA	17.19	5.49	3	30
GDS	3.55	2.81	0	15
Barthel	96.29	6.77	45	100
Sleep hours	6.26	1.69	1	15
Age	70.15	9.37	45	98
Education years	7.13	4.44	0	25
	N	**%**		
Sex				
Female	380	82		
Male	83	18		
Partnered				
Yes	256	55		
No	207	45		
Area of residence				
Urban	372	80		
Rural	91	20		
Weekly fish intake				
< once	195	42		
Once	188	41		
> once	80	17		
Cardiac problems				
No	434	94		
Yes	29	6		
Liver problems				
No	426	92		
Yes	37	8		
Renal problems				
No	437	94		
Yes	26	6		
Exercise level				
Low	147	32		
Middle	175	38		
High	141	30		

Table 2. Linear regression analysis.

Variables	B	EE	T	p	η2par
Intro Model					
Origin	14.210	1.992	7.134	.000	
MoCA Full	-.080	.025	-3.201	.001	-.122
Barthel	-.056	.014	-4.056	.000	-.154
Sleep Hours	-.359	.067	-5.375	.000	-.205
Sex	.301	.310	.970	.332	.037
Age	-.010	.014	-.731	.465	-.028
Education years	-.090	.032	-2.812	.005	-.107
Partnered	.245	.140	1.752	.080	.067
Area of residence	.376	.292	1.287	.199	.049
Fish intake	-.341	.160	-2.135	.033	-.081
Cardiac problems	.187	.459	.408	.683	.016
Liver problems	-.280	.435	-.644	.520	-.025
Renal problems	1.438	.497	2.896	.004	.110
Exercise level	-.445	.145	-3.074	.002	-.117
Stepwise Final Model					
Origin	14.369	1.380	10.416	.000	
MoCA Full	-.079	.023	-3.385	.001	-.129
Barthel	-.056	.013	-4.184	.000	-.159
Sleep Hours	-.360	.066	-5.424	.000	-.207
Education years	-.079	.031	-2.526	.012	-.096
Fish intake	-.358	.155	-2.307	.021	-.088
Renal problems	1.339	.470	2.848	.005	.108
Exercise level	-.415	.142	-2.916	.004	-.111

Discussion

The prevalence of depression in adult day care centers in Ecuador found in this study was 38%, somewhat higher than that observed in other studies in Latin America, which showed a prevalence of around 23%.[40] However, studies looking at depression in day care settings in other regions showed consistent or even higher prevalence, including Bahrain (41.7%),[41] Malaysia (59.1%)[42] and India (63.1%).[43] In the current study, several types of variables were considered as possible correlates of depression in older adults, including demographic, functional, physical, cognitive, and behavioral. Ultimately, a combination from most of these dimensions best accounted for the presence of depression in our population. Age, hours of sleep, functional autonomy, cognitive decline, exercise, renal impairment, marital status, and even aspects of diet, such as levels of fish intake, were important predictors.

An interesting finding is that fish consumption between one to two times per week is associated with a lower presence of depressive symptoms. In line with these results, a systematic review conducted by Appleton, Rogers and Ness[22] showed a negative association between fish consumption and the presence of depression. This corroborates the importance of proper diet for mental health.[21,44] Fish is a food rich in omega 3, and this has been shown to be important in the prevention of diseases associated with aging such as depression and cognitive impairment.[22,45] Insomnia has also been established as a risk factor for both the onset and persistence of depression, a finding replicated in the current

study[46] This reinforces the importance of sleep quality for the emotional well-being of the older adult, as shown by several studies that have associated the amount of sleep (both too much and too little) with greater health problems, such as depression, cognitive impairment or increased risk of mortality[47-49]

While rest is important, the relationships found here between weekly physical exercise habits and depression scores identify exercise as a possible protective factor against depression in older adults. These results coincide with those reported by Sarro-Maluguer[14] where they show that less physical activity is associated with higher depression scores. What's more, functional autonomy and level of depression are negatively correlated in the current study, with similar data reported in other studies where they indicate that patients with greater dependence in both instrumental and basic activities are more depressed.[14,40]

Depression and cognitive impairment have been two conditions traditionally linked in the literature, to the point where depression is currently recognized as a risk factor, a prodromal expression and even a symptomatological presentation of dementia.[18] The results obtained in this study regarding such relationship are in line with what has been identified in previous work[50,51] A decline in brain functioning is not the only organic health correlate of depression found here, as renal damage had an association with depression levels as well. Patients with renal damage or injury tended to score higher on depression levels. Similar results were obtained by Wen et al.[16] in their 4-year longitudinal study, where they found that the presence of kidney damage and reduced kidney functioning meant a higher probability of depression This relationship is a very important measure for primary care in older adults, since it allows predicting and therefore intervening early on possible emotional problems after detecting alterations in kidney function.

Of note, neither sex nor age were significant predictors in the final model, while education, was negatively associated with depression scale. Other studies report that older adults with higher educational levels tend to invest more time in social and leisure activities, which are associated with a better quality of life[52] In men, higher depression scores were observed in those with lower educational levels, unemployment, and single or divorced marital status[53] Other studies agree with our results reporting an absence of relationship between education and depressive symptoms[5] These differences could be mediated by the characteristics of the sample.

This study has some limitations such as the lack of randomization in the sample selection, greater representativeness of the female sex, and the lack of identification of sociodemographic variables of interest such as socioeconomic status[3;54,55]

Nevertheless, this is the first study to identify the prevalence of depression in adult day care center in Ecuador, while considering the many types of variables that contribute to depression in older adults in this setting. Results clearly suggest that depression in older adults is a complex phenomenon that is determined by multiple factors, and as such, addressing each in isolation is not likely to have a full impact. Cognitive impairment, education, renal impairment, functional autonomy, fish consumption, sleep and physical exercise could be targets of public policies focused on the identification of these variables and thereby help in the prevention of depression in the older adult.

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