ISSN 1695-6141
Revista electrónica trimestral de Enfermería
N°61
Enero 2021
www.um.es/eglobal/

ORIGINALES

Depression, anxiety, cognitive function, and functional dependence in hospitalized older adults

Depresión, ansiedad, función cognitiva y dependencia funcional en adultos mayores hospitalizados

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https://doi.org/10.6018/eglobal.422641

Received: 11/04/2020
Accepted: 19/07/2020

ABSTRACT:

Objective: Determine the relationship between depression, anxiety, and cognitive function with dependency in older adults.
Materials and Method: Descriptive and correlational cross-sectional study conducted on 98 hospitalized older adults. The Hospital Anxiety and Depression Scale, the Montreal Cognitive Evaluation Test, and the Barthel Index were applied.
Results: Age, gender, depression, anxiety, and cognitive function explain 33% of functional dependency. The variables that influence dependence to carry out basic activities in daily life were gender (p = .000), depression (p = .002), and cognitive function (p =.002).
Conclusions: In assessing the functionality of hospitalized older adults, gender, depression, and cognitive function are important to consider.

Key words: Depression; anxiety; cognition; daily life activities; older adult.

RESUMEN:

Objetivo: Determinar la relación entre la depresión, ansiedad y función cognitiva con la dependencia en adultos mayores.
Material y Método: Estudio descriptivo y correlacional de corte transversal en 98 adultos mayores hospitalizados. Se aplicó la Escala Hospitalaria de Ansiedad y Depresión, el test de evaluación cognitiva de Montreal e Índice de Barthel.
Resultados: La edad, el género, la depresión, la ansiedad y la función cognitiva explican el 33% de la dependencia funcional. Las variables que influyen sobre la dependencia en las actividades básicas de

la vida diaria fueron el género (p=.000), la depresión (p=.002) y la función cognitiva (p=.002).
Conclusiones: En la valoración de la funcionalidad del adulto mayor hospitalizado es importante considerar el género, la depresión y la función cognitiva.

Palabras clave: depresión; ansiedad; cognición; actividades cotidianas; anciano.

INTRODUCTION

Increased life expectancy and birth control have resulted in an increase in population[1]. Living longer is a challenge for people, because it means staying active in the best physical, emotional, and psychological condition. For the older person this implies personal, family, financial, and social challenges.

As people get older, the risk of having any illness increases, and suffering from one or more diseases increases the likelihood of being hospitalized, thus, causing states of anxiety and depression, cognitive impairment, and functional dependency. During hospitalization, prevalence of anxiety and depression symptoms has been found to be 40 to 50%[2].

Depression and anxiety are very common mental disorders[3] and scientific evidence shows that patients hospitalized in intensive care have anxiety and depression that amount to 20 to 30%[4] and in internal medicine of 22% and 28% respectively[5]. Depressive symptoms affect more women with functional dependence regarding basic activities of daily life, and diabetes mellitus is the disease that has been most commonly associated with depressive symptoms[6]; other authors mention figures that reach 57% with respect to the aforementioned symptoms[7].

Additionally, the process experienced by older people during hospitalization and their lack of ability to adapt[8] can influence their cognitive function; decreased communication, separation from loved ones, treatment, physical space, air, lighting and odors are all situations that occur and are likely to have a negative influence and favour conditions that increase states of anxiety, depression, and functional dependency[9].

Functional dependency is defined as “the state in which people find themselves who, for reasons linked to the lack or loss of physical, psychological, or intellectual autonomy, have a need for significant assistance or help in carrying out daily life activities”. Literature shows that physical activity could protect cognitive abilities and is also necessary to improve the quality of life[10] and when it is lacking there is a vicious circle, where emotional disorders can be as disabling as any other physical illness.

The National Institute of Mental Health mentions that conditions of fear, distrust of others and disruption of family relationships during hospitalization make people more vulnerable, which presents a risk of complications unrelated to the disease of admission, and may prolong the hospital stay[11]. Being hospitalized for a long time and the reduction of physical activity conditions the patient to show risk factors in the cardiovascular, respiratory, and musculoskeletal system systems.

Literature shows that 33% of hospitalized older adults will have functional impairment in at least one of the activities of their daily life, and this will increase to 50% when they are 80 years old or above[12]. Despite the health relevance of variables such as depression, anxiety, depressive symptoms, and functional impairment in hospitalized older adults, not enough scientific evidence has been found to help prepare strategies to identify health conditions in the population[13].

Because of their location in the hospital and care setting, nursing professionals can help detect early symptoms of anxiety, depression, and impaired cognitive function in hospitalized adults.

Therefore, the objective was to determine the relationship that depression, anxiety, and cognitive function have with dependency in older adults. The aim is that the results of this work increase the knowledge of nursing professionals in order to guide interventions to identify and improve emotional situations, and to prevent the loss of functions in the hospitalized older adult; this will benefit the health institutions by reducing the time of hospitalization and improving the quality of life of the elderly.

METHODOLOGY

The design of the study was descriptive and correlational cross-sectional; it was conducted in the city of Matamoros, Tamaulipas (Mexico). The selected population was comprised by adults aged 60 and above who were admitted to a General Hospital in Matamoros, Tamaulipas. The sampling used was non-probabilistic and for convenience, which included 98 older adults who were admitted to the hospital at the time data collection was performed. Included as older adults were people aged 60 and above who were admitted to a hospital in the internal medicine, surgery, and obstetrics/gynecology wards during the second half of 2018.

Data were collected using a personal data card for the registration of socio-demographic and health data. The Hospital Anxiety and Depression Scale[14] was used to measure anxiety and depression. It contains 14 items, seven of which measure anxiety and the other seven measure depression. The response option is a Likert type scale that uses a range of zero to three. For the assessment, a summation is made by subscale, with a minimum score of zero and a maximum score of 21. Cut-off points of zero to seven indicate normal results, eight to ten suggest probable cases of anxiety and/or depression, and 11 to 21 indicate cases of anxiety and/or depression; for Mexican population, a Cronbach's Alpha of .88 to .90 was reported[14].

The Montreal Cognitive Assessment Test (MoCA)[15] was used to measure cognitive impairment. The questions and scores are: visuospatial/executive level (5 points), identification (3 points), attention (6 points), language (3 points), abstraction (2 points), delayed recall (5 points), and orientation (6 points). The points obtained in each of the evaluated skills have to be added up, a score equal to or higher than 26 corresponds to a normal individual, and a lower score classifies the individual with slight cognitive impairment. It should be noted that this instrument suggests adding one point to the final summation for those subjects who report less than 12 years of schooling[15]. The Cronbach's Alpha reported by the Spanish version on older adults is .77[16].

The functional dependency was measured with the Barthel's Index[17]; it measures 10 Basic Activities of Daily Life (BADL), and with respect to the way they carry out their activities a score that varies from zero to fifteen points is assigned. Finally a summation is made that goes from 0 to 100 points. The overall results are grouped into four dependency categories and those suggested by Shah, Vanclay, and Cooper were considered[17]: 1) Less than < 21 points = total dependency, 2) 21 to 60 points = severe dependency, 3) 61 to 90 points = moderate dependency, 4) 91 to 99 points = low dependency, and 5) 100 points = independence.

The study was approved by the Ethics and Research Committee of the Matamoros Multidisciplinary Academic Unit of the Autonomous University of Tamaulipas, (Registry 050). The considerations of the study included the recommendations of the Regulations of the General Health Act for Research, respect for the dignity and rights of the participants, as well as privacy, and informed consent.

Data analysis was performed with the IBM SPSS software version 21 for Windows. Descriptive statistics were used through frequencies and proportions that allowed the description of the socio-demographic aspects of the participants. For the distribution of the variables the Kolmogorov-Smirnov goodness-of-fit test with Lilliefors correction was used, and depending on the results it was decided to use non-parametric statistics (Man-Whitney U and Spearman correlation). A general linear model of univariate contrast was performed where the variables depression, anxiety and cognitive function were independent variables and the dependency on BADL was a dependent variable.

RESULTS

Ninety-eight hospitalized older adults with an average age of 66.30 years (SD=6.382) were evaluated; 55.1% (*f*=54) were women, 55.1% (*f*=54) were single. The study showed that 42.9% (*f*=42) showed no signs of depression, 30.6% (*f*=30) with probable depression, and 26.5% (*f*=26) with established depression. 53.1% (*f*=53) showed no signs of anxiety, 33.7% (*f*=33) with probable anxiety, and 13.3% (*f*=13) with established anxiety.

60.2% (f=59) resulted with cognitive impairment. In the Basic Activities of Daily Life (BADL), 8.2% (*f*=8) resulted with total dependency, 26.5% (*f*=26) with severe dependency, 34.7% (*f*=34) with moderate dependency, 4.1% (*f*=4) with slight dependency, and 26.5% (*f*=26) with independence. Other descriptive data regarding depression, anxiety, cognitive function, and functional dependence are shown in Table 1.

Table 1. Descriptive data of depression, anxiety, cognitive function, and functional dependency:

Variable	Min	Max	Mean	SD
Age	**60**	**92**	**66.30**	**6.382**
Depression	0	17	8.13	3.732
Anxiety	0	14	7.08	3.105
Cognitive Function	0	30	23.02	5.962
Functional Dependency	1	100	69.69	27.487

The Spearman's correlation test showed that age is positively associated to depression (r_s=.264; *p*=.009) and anxiety (r_s=.245; *p*=.015); age is negatively associated to cognitive function (r_s=-.258; *p*=.010) and functional dependence (r_s=-.225; *p*=.026). Table 2 shows that depression (*p*=.000), anxiety (*p*=.011), and cognitive function (*p* .001) were significantly related to functional dependency to perform daily life activities.

Table 2. Relationship between depression, anxiety. and cognitive function with functional dependency:

Variable	Functional Dependency	
	r_s	*p*
Depression	-.419	.000
Anxiety	-.256	.011
Cognitive Function	.319	.001

A linear regression analysis was performed to find out the variables that influence functional dependency. Independent variables such as age, gender, marital status, depression, anxiety, and cognitive function explain 33% of functional dependency [*F*(6, 97)=9,031, *p*<.001; R^2=.33]. The significant variables in the model were gender, depression, and anxiety (Table 3).

Table 3. Influence of personal variables, depression, anxiety, and cognitive function on functional dependency:

Variable	SC	g[l]	CM	F¶	*p*
Age	.805	1	.805	.002	.968
Gender	7269.48	1	7269.486	14.401	.000
Marital Status	364.39	1	364.390	.722	.398
Depression	5021.43	1	5021.434	9.947	.002
Anxiety	11.55	1	11.557	.023	.880
Cognitive Function	5354.65	1	5354.659	10.607	.002
Functional Dependency: Adjusted R = .33					

DISCUSSION

The demographic characterization performed in this research is closely related to the data reported by the Inter-American Development Bank (IDB) in its report "*Panorama de Envejecimiento y Dependencia en América Latina y el Caribe*" (Scenario of Aging and Dependency in Latin America and the Caribbean), which reports similar variables and other conditions that explain a context that establishes that 70% of the years of life lost due to premature death and disability in this region is attributable to cardiovascular diseases, followed by neurodegenerative disorders such as Alzheimer's Disease, and senile dementia[18]. These same conditions generate varying degrees of dependency and physical and psychological symptoms with a significant impact on the quality of life[20].

The results of the correlation test showed that the older the person, the greater the depression and the greater the anxiety; this differs from what was found by Hernandez et al.[21], who evaluated a group of institutionalized older adults and found no relationship between age and depression. In this regard, when reviewing the available literature, no evidence that allows us to evaluate the significant relationship between age and psychological disorders such as anxiety was found; however, age is a variable that has been demonstrated to be associated with disorders such as

morbidities[22, 23].

Moreover, when evaluating the association between age and cognitive impairment, it was found that the older the person, the greater the cognitive impairment; a situation that is supported by results in countries such as Colombia, where Camargo et al.[24] established that 41.7% of adults over 60 years of age, presented serious cognitive impairment. Likewise, literature reviews were able to determine variable degrees of moderate cognitive impairment that depended on the age groups studied[25]; which established the relationship between this variable and the prevalence of such condition.

Likewise, literature documents an increase in functional dependency with the aging process, being more marked as age increases; as reported by Laguado et al.[26] in their research on older adults institutionalized in welfare centers, who established some degree of dependency in those over 60 years of age, a similar result that the one found in this research, stating that the older the age, the greater the functional dependency.

When the relationship between conditions such as depression and anxiety in older adults and cognitive function was analyzed with dependency, it was found that the greater the depression, the greater the functional dependence; likewise, the greater the anxiety, the greater the functional dependency, and the lower the cognitive function, the greater the degree of dependency. This relationship was addressed when studying the mental health of the elderly, showing a positive association, as can be seen in a study in Spain that showed that high levels of depression, anxiety, and cognitive impairment have a positive correlation with functional dependency[27], which is equal to the results obtained in this research.

For its part, the linear regression model showed that the variables age, gender, marital status, depression, anxiety, and cognitive function influence the functional dependency of hospitalized older adults. This situation varies in different studies, as some have found a statistically significant relationship between these variables and dependency[20], while others have obtained different results.

CONCLUSIONS

In relation to the phenomenon of functional dependency in older adults, this research shows a positive relationship between this and demographic variables such as age, gender, and marital status, as well as with biological variables such as cognitive impairment.

The foregoing provides important elements within the framework of the process of care for this population; although it is true that the variety of existing results makes it difficult to unify criteria, it also allows us to glimpse a scenario that requires further research to find elements that can be used by the decision-makers to guarantee interventions focused on healthy aging.

From a biological perspective, it has to take into account that the ageing process includes a significant reduction not only in the physical capacity but also in the mental

To conclude, the projections made by international organizations such as the World Health Organization regarding the aging of the population have been fulfilled; an older adult population with a growing demand for healthcare services has been seen. This

becomes a point of interest for multidisciplinary healthcare teams.

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ISSN 1695-6141