

UCUENCA

Facultad de Ciencias Médicas Maestría en Epidemiología

Factors associated with food insecurity in older adults, Ecuador

Trabajo de titulación previo a la
obtención del título de Magister en
Epidemiología

Modalidad: Artículo científico

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Cuenca, Ecuador

03-agosto-2022

Resumen: El objetivo fue determinar la relación entre diversos factores y la inseguridad alimentaria, con un estudio analítico transversal en 400 adultos mayores que viven en zonas rurales y urbanas de la provincia de Azuay en el sur de Ecuador. La seguridad alimentaria se midió utilizando la Escala de Seguridad Alimentaria de América Latina y el Caribe (ELCSA). Los datos fueron analizados en la versión 15 del programa Statistical Package for the Social Sciences (SPSS), y se utilizó el Odds Ratio con IC 95% para determinar la asociación estadística. La incidencia de la inseguridad alimentaria fue mayor en los adultos mayores que viven en hogares compuestos únicamente por miembros mayores de 18 años (43.7%) y en las zonas rurales (65%). La inseguridad alimentaria es alta en los adultos mayores, especialmente en individuos que viven en zonas rurales y que tienen bajos niveles educativos y niveles socioeconómicos bajos. Es necesario implementar políticas públicas y estrategias preventivas para mitigar el riesgo de inseguridad alimentaria en los adultos mayores.

Palabras claves: Inseguridad alimentaria. Adultos mayores. Enfermedades crónicas no transmisibles. Educación. Nivel socioeconómico.

Abstract:

The object was to determine the relationship between various factors and food insecurity, with cross-sectional analytical study of 400 older adults living in rural and urban zones in the province of Azuay in southern Ecuador. Food security was measured using the Latin American and Caribbean Food Security Scale (ELCSA). The data was analyzed using version 15 of the Statistical Package for the Social Sciences (SPSS) program, and the Odds Ratio with IC 95% was used to determine statistical association. The incidence of food insecurity was higher in older adults who live in households comprised only of members above the age of 18 (43.7%), and in rural zones (65%). Food insecurity is high in older adults, especially in individuals who live in rural areas and who have low levels of education and low socioeconomic levels. It is necessary to implement public policy and preventative strategies to mitigate the risk of food insecurity in older adults.


Keywords: Food insecurity. Older adults. Chronic non-communicable diseases. Education. Socioeconomic levels.

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INTRODUCTION

The increase in life expectancy has resulted in an increase in the elderly population as well. According to the World Health Organization (WHO)¹, the number of older adults passed 900 million in 2012 and is expected to reach 2000 million in the year 2050; however, this does not mean that the quality of life of older adults is better. Therefore, it is essential that certain life conditions are met in order to permit older adults to live in a globalized world where economic changes and low employment opportunities for this age group do not permit them to enjoy an adequate quality of life, and where food security is a determining factor to promote healthy aging^{2,3}.

Food insecurity, added to the vulnerability of this age group, may very well worsen older adults' health related problems⁴. The lack of acquiring nutritionally healthy food and limited access to medical attention and social programs⁵, predispose this group to various chronic diseases, a deterioration in mental health, heart disease and functional limitation⁶, greater fragility and disability risk, cognitive deterioration and behavioral changes,⁷ in comparison with individuals that have food security⁸.

The negative effects of food insecurity in older adults have a close relationship with chronic non-communicable diseases⁹. For example, a person with diabetes is 4% more likely to suffer food insecurity, and 28.8% of households where food insecurity exists, are comprised of older adults with this disease^{10,11} 90% of older adults have two or more chronic health issues such as: arterial hypertension, type 2 diabetes, depression, or lack of visual acuity, all which represent an important public health problem and require clinical attention¹². Additionally, the relatively high cost of medical treatment as well as other costs of living such as food, clothing, and education^{10,12} contribute to greater food insecurity due to unbalanced budgets in homes especially when the older adults are the economic support of the family.

In the first report published by the United Nations Organization for the Food and Agriculture Organization with data from 2014, the prevalence of food insecurity was 8.6% in Colombia, 10.9% in Guatemala and 7.5% in México⁵ where food insecurity affected 85.9% of indigenous households¹³. In the United States in the year 2017, 7.9% of all households where at least one adult over the age of 65 lived, and 8.6% of older adults who lived alone suffered from food insecurity¹⁰. This represents a serious health and nutrition problem that will only get worse if not addressed and if preventative interventions are not implemented⁹.

The objective of this study is to determine the relationship between food insecurity and associated factors such as chronic non-communicable diseases, educational levels, socioeconomic levels, household composition, polypharmacy, and place of residence (urban or rural) of older adults.

MATERIAL AND MET

HODS

This cross-section analytical study was carried out in the province of Azuay in southern Ecuador. The analyzed sample was calculated with the EPIDAT program version 3.1 considering 55834 older adults of both urban and rural zones with a margin of error of 5% and an expected proportion of 67% of food insecurity in the elderly homes with an IC of 95%. Four hundred older adults participated in the study, after approval by the Bioethics Committee of the University of Cuenca (COBIAS University of Cuenca) and after the older adults signed the informed consent. The resulting data was analyzed using version 15 of the Statistical Package for the Social Sciences (SPSS) program, and in order to determine the association between the variables, the Odds Ratio was used with confidence index 95% and Chi² for a statistical significance with a value of $p < 0.05$.

The Latin American and Caribbean Food Security Scale (ELCSA) was used to determine food insecurity in the older adult population. The scale is conformed of 15 questions divided into two segments:

the first segment includes 8 specific questions directed at food insecurity in households comprised only of older adults; the second segment includes questions for households with minors (children under the age of 18) present. Food insecurity was categorized in the two different groups according to the composition of the living quarters A) Households comprised only of adults with the following scores: Food security = 0 points, mild food insecurity = 1 to 3 points, moderate Food insecurity = 4 to 6 points and severe Food insecurity = 7 to 8 points; B) Households with both older adults and minors with the following scores: Food security = 0 points, mild Food insecurity = 1 to 5 points, moderate Food insecurity = 6 to 10 points and severe Food insecurity = 11 to 15 points¹⁴.

Socioeconomic Level: The Socioeconomic Level Stratification Survey of the National Institute of Statistics and Censuses (INEC) was used, which includes the following socioeconomic groups: upper, upper-middle, middle, working and lower class¹⁵.

Polypharmacy: Determined when an older adult uses 3 or more medications simultaneously¹⁶.

Chronic non-communicable diseases: The World Health Organization's classification is used in this study: type 2 diabetes, cardiovascular diseases, chronic obstructive lung disease, and cancer¹⁷.

Household Composition: When the older adults lived alone or with others (spouse, children, grandchildren, others).

Education Level: The education level was classified according to the number of years of approved studies in the following categories: no formal schooling, incomplete elementary education, completed elementary education, incomplete secondary education, completed secondary education, incomplete higher education, and completed higher education (university level)¹⁸.

Place of Residency: When the older adults lived in an urban or rural zone for more than one year.

RESULTS

Four hundred older adults from both the urban and rural zones of the province of Azuay participated in the study. The average age of the study population was 77.2 years (DS \pm 7.7). 60.3% of the participants were women and 95% of mixed ethnicity, with 30.5% of the study population completing elementary school (Table 1).

Table 1. Sociodemographic characteristics of 400 older adults, Azuay-Ecuador, 2020

Variables	n	%
Age		
65 - 74	161	40.3
75 - 84	161	40.3
85 or older	78	19.5
Sex		
Female	241	60.3
Male	159	39.8
Ethnicity		
Caucasian	16	4.0
Mixed	380	95.0
Indigenous	4	1.0
Education Level		
No formal schooling	47	11.8
Incomplete elementary education	144	36.0
Completed Elementary Education	122	30.5
Incomplete High School Education	27	6.8

Completed High School Education	23	5.8
Incomplete University Level Education	12	3.0
Completed University Level	21	5.3
Others	4	1.0
Residency		
Urban	188	47.0
Rural	212	53.0

Older adults with no formal schooling were found to be 2.73 times more likely to suffer food insecurity. A significant association was found between older adults with no formal schooling and food insecurity (58%). In the case of older adults who live with minors, no association was found between their level of education and food insecurity.

A relationship was found between food insecurity and residence in rural areas in the study population. Regardless of if the older adults lived in a household comprised of only adults or adults and minors, the probability of suffering food insecurity was three times higher for those living in rural areas.

An association was found between older adults in low socioeconomic groups and food insecurity. The probability of those older adults living in households comprised only of adults was 4.3 times more likely and for those older adults living in households with minors present 3.7 times more likely.

No significant association was found; however, between food insecurity and older adults who suffer Chronic non-communicable diseases and polypharmacy (Table 2.).

Table 2. Factors associated with Food Insecurity in Older Adults, Azuay-Ecuador, 2020

	Food Insecurity	Food Security	OR	IC95%	p
Household of OA with no minors present	n=175 (%)	n=129 (%)			
Education Level					
No formal education	101(58)	43(33)	2.73	(1.70-4.38)	0.000
Formal education	74(42)	86(67)			
Place of Residence					
Rural	113(65)	48(37)	3.07	(1.91-4.93)	0.000
Urban	62(35)	81(63)			
Socioeconomic Level					
Lower class	140(56)	62(25)	4.32	(2.60-7.17)	0.000
Middle and Upper class	35(44)	67(75)			
Household Composition					
Live alone	53(30)	27(20)	1.64	(0.963-2.79)	0.067
Does not live alone	122(70)	102(80)			
Polypharmacy					
Yes	75(42.8)	68(52.7)	0.67	(0.425-2.106)	0.089
No	100(57.1)	61(47.2)			
Chronic non communicable diseases (NCDs)					
Yes	75(42.8)	63(48.8)	0.78	(0.498-5.124)	0.301
No	100(57.1)	66(51.1)			
Household where OA lives with minors under the age of 18					
	n=52(%)	n=44(%)	OR	IC95%	valor p
Education Level					

No formal education	28(54)	19(43)	1.53	(0.684-3.44)	0.298
Formal education	24(46)	25(56)			
Place of Residence					
Rural	34(65)	17(39)	3	(1.30-6.90)	0.009
Urban	18(35)	27(62)			
Socioeconomic Level					
Lower class	29(56)	11(25)	3.78	(1.57-9.07)	0.002
Middle and upper class	23(44)	33(75)			
Polypharmacy					
Yes	21(40.3)	23(52.2)	0.61	(0.275-1.39)	0.244
No	31(59.6)	21(47.7)			
Chronic non communicable diseases					
Yes	31(50.6)	22(55.2)	1.47	(0.656-3.31)	0.244
No	21(40.3)	22(44.7)			

DISCUSSION

The results of this study show that 56.7% of older adult households suffer some degree of food insecurity. Factors that are associated with this phenomenon include poverty and low economic status which make receiving adequate medical attention more difficult, as well as the lack of a salary from employment or retirement benefits in order to be able to purchase sufficient food^{19,20,21}. In contrast, a study in Canada shows that only 2.4% of older adults suffer either moderate or severe food insecurity due to the better life conditions of the population²².

In addition, the results of this research are very worrying due to the negative effects that food insecurity produces, in older adults and in any person of any age group who is at risk of suffering from it²³, so when evaluating each question of the ELCSA survey, more than a half reported that a meal time was omitted, and three quarters reported that they had a continuous day without food. Probably this situation is due to lack of economic resources to acquire food. Studies in Canada and Mexico found that practically the majority the older adults, skipped meal times or habitually spent an entire day without eating, when they suffer food insecurity for lack of financial resources^{24,25}, which reflects a latent problem in older adults worldwide.

The figures of food insecurity in older adults who live in households with minors are also high, which is detrimental not only for the older adults, but also for the younger children. Studies in Canada, Australia and the United States found that 1 out of every 6 children live in a situation where food insecurity is present and those children suffer more psychological disorders such as depression and suicidal thoughts, have higher absenteeism records and probability rates of failure at school, and suffer the presence of chronic diseases, headaches, stomachaches, and common colds^{26,27,28}.

Older adults living in rural areas have a higher prevalence of food insecurity than those living in urban areas. According to literature, two studies confirm this association^{26,29,30}. The cause of food insecurity are multifaceted in rural zones, including poverty that reaches a rate of 17.2% in Ecuador where a considerable number of older adults live in extremely vulnerable conditions making food insecurity much more likely than in urban areas³¹.

The results of this study found that older adults living at a low socioeconomic level were at significantly higher risks of suffering from food insecurity. A similar study that compared the consumption of food and its relation to socioeconomic factors in a group of older adults found that individuals in the middle or higher class consumed a better diet and were therefore less prone to suffer from food insecurity than those who belong to the lower class^{2,32}.

This study found that individuals who have fewer economic resources as well as possess lower levels of education are at a higher risk of facing food insecurity. These findings are consistent with data from similar studies in which older adults with related characteristics such as low income, lower education of the head of household, and large households have been found to be food insecurity^{26,32,33,34}. Being that economic income is an essential resource to obtain nutritionally healthy food, the lack of a retirement pension or other source of income leads to a deficient intake of healthy food^{2,21}, as food insecurity is closely related to economic income, the lower the income the higher the likelihood of food insecurity²⁵.

The results of this study do not show a direct relationship between household composition and food insecurity; one probable cause is that in this research, we did not evaluate whether older adults had any support network, since the Feed Ecuador program through the Ministry of Economic and Social Inclusion (MIES) found that 89% of older adults received some kind of help in the form of money, services, things or company³⁵. Nevertheless, a study carried out in the United States showed that rates of food insecurity were higher in households where older adults lived alone³⁶; in the Health, Well-Being, and Aging Survey conducted in 2.010 (SABE) in Ecuador, 132365 older adults live alone, because they became widowed or because their sons and daughters formed their own home,³⁵ 41000 also live in poor and destitute conditions because they suffer from abandonment, are considered of little use, or because they refuse to leave their own home to live with one of their sons and daughters, or simply because they prefer to live alone, which makes them vulnerable due to the lack of economic resources to subsist on a daily basis, since only 13.6% of older adults have a job that is adequate for their age and sex³⁷. A study in the United States showed that older adults who lived with their spouse were less likely to suffer food insecurity³⁸.

In this study chronic non-communicable diseases were not associated with food insecurity; nevertheless, the prevalence of food insecurity was high for individuals suffering from these diseases. Additionally, scientific evidence mentions obesity, age, smoking, a poor diet, high sodium intake³⁹, alcohol consumption, low fruit and vegetable intake, and low physical activity⁴⁰ as causes of Chronic non-

communicable diseases. These risk factors can begin in childhood and continue throughout ones' entire life⁴¹.

A study in the United States found that the food budget of older adults who have chronic non-communicable diseases was affected and as a result the prevalence of food insecurity increased by 27.8%¹².

No relationship was found in this study between drug intake (polypharmacy) and the risk of experiencing food insecurity; nevertheless, two studies have revealed that patients who practiced polypharmacy had a higher risk of suffering from food insecurity and less adherence to medication, some older adults give up food shopping to buy their medications⁴²⁻⁴⁴. A probable cause of why these results are not related is that adherence to medication was not analyzed in this study.

The present study is the first to investigate factors associated with food insecurity in older adults and thus serves as the basis for further studies. A limitation of our study is that it did not include an analysis between the amount of money older adults spend on medicine and medical treatment and rates of food insecurity, nor did it quantify financial resources allotted for the purchase of food analyze economic income in order to relate it to food insecurity, since the larger the family, the greater the needs are.

In this study, low economic levels, living in rural areas, and having little or no formal education were factors found to be associated with food insecurity in older adults. Food insecurity in this age group may be a result of the lack of money and other resources to obtain food, as well as high levels of chronic illnesses which make older adults more vulnerable.

The high prevalence of food insecurity (more than 50%) in our country is a shocking reality, despite the existence of protection and care policies for the elderly population, the Comprehensive Care Program for the Elderly, however they have not been successful. It is necessary to regulate all these policies in order to expand or correct them, rethink the strategies so that they are complied with, watched over and become a reality, in which local, regional and national administrations must intervene, seeking a debate so that they

are complied with and sustainable over time through programs specifically aimed at protecting the integrity of the elderly and thus reduce food insecurity.

***Founding Source:** This research was funded by the Direction of Research of the University of Cuenca through an awarded grant from the XVII University Competition of Research Projects, with the funding number 2040000071644.*

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