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Investigating Food Insecurity and Its Socioeconomic Factors in Older People

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ABSTRACT

Introduction: Older people are a vulnerable group whose poor nutritional status contributes to the development of diseases and increased health costs.

Objective: This study investigated food insecurity and its socioeconomic factors among older people visiting comprehensive health centers in East Guilan, north of Iran.

Materials and Methods: This cross-sectional analytical study was conducted on 245 older people referred to comprehensive health centers in East Guilan. The sampling method was a multi-stage clustering method. The data were collected using the Socioeconomic Status (SES) questionnaire, the Household Food Insecurity Access Score (HFIAS), and demographic characteristics through interviews. Data analysis was performed using statistical methods, including a univariate chi-square test and a multiple logistic regression analysis, to examine the simultaneous effect of independent variables on severe food insecurity.

Results: The mean age of the samples was 67.66±6.059 years, 50.6% were male, and 49.4% were female. In terms of food security, 0.4% had complete food security, 11.8% had mild insecurity, 43.7% had moderate food insecurity, and 44.1% had severe food insecurity. In terms of SES, 50.2% were too inadequate, 38% were inadequate, 11.4% were partially adequate, and 0.4% were adequate. The mean food insecurity index was 14.37±5.123. At the 95% confidence level, the relationship between food security and situation of socioeconomic (OR=1.839, 95% CI, 1.497, 2.338, P=0.001), marital status (OR=0.589, 95% CI, 0.370, 0.938, P=0.001), income (OR=2.202, 95% CI, 1.541, 2.974, P=0.001), education (OR=1.735, 95% CI, 1.127, 2.669, P=0.001), the number of family workers (OR=1.411, 95% CI, 1.054, 1.876, P=0.001) were significant.

Conclusion: According to the results of the present study, the majority of people (43.7%) experienced moderate food insecurity. Notably, at higher levels of SES, the level of food insecurity was lower. Also, there was a significant positive relationship between the severity of food insecurity and low SES.

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Highlights

- Food insecurity is a major health problem for all ages, especially older people in developing countries.
- Socioeconomic factors influence food insecurity.
- Based on results a relationship existed between food insecurity and economic status, social status, and demographic characteristics.

Plain Language Summary

Older people are a vulnerable group whose poor nutritional status provides the basis for the occurrence of diseases and increased health costs. Therefore, this particular group should receive more attention, along with other age groups, and special attention should be paid to their nutrition. Unfortunately, we have been facing economic challenges for some time, and the increasing cost of basic household goods has caused nutritional problems for almost all family members. Given the economic situation and the growing cost of goods in the household basket, the middle-aged and older groups of society are currently more likely to suffer from malnutrition and the resulting diseases. This study was conducted among 245 older individuals referred to comprehensive health centers in eastern Guilan Province, Iran. The results showed a significant positive relationship between the severity of food insecurity and low Socioeconomic Status (SES).

Introduction

The increase in the older population in countries is associated with greater vulnerability and disability. These negative health consequences have a direct impact on access to sufficient food and food insecurity. The older the head of household, the lower the likelihood of food security in the family [1, 2]. Experimental evidence shows that the prevalence of food insecurity among older people is very high due to physical limitations, poor heart conditions, social isolation, and lack of means of transport [3].

Food security is defined as a situation in which all people have access to adequate, safe, and nutritious food at all times to maintain a healthy and active life [4]. Food insecurity, on the other hand, exists when individuals lack full social, economic, and physical access to adequate and healthy food at all times, thereby failing to meet their nutritional needs for a healthy and active life [5]. Household food insecurity, which occurs when a person or family lacks access to food due to financial or other constraints, is a growing public health problem in most developed countries, especially in cases where there is inequality in food sharing [6].

Food insecurity affects more than 820 million people worldwide [7]. The results of recent research in Iran have shown that 73% of urban households experience food security, while 27% face food insecurity [8]. Food insecurity is a major risk factor for malnutrition and has negative consequences for the health of the population [9, 10].

Meanwhile, nutritional poverty in older adults who sometimes have poor dietary patterns is associated with a higher risk of malnutrition, weakness, worsening health conditions, disability, adverse effects on their quality of life and health, and functional impairments. Lack of home, isolation, gender, financial vulnerability, and poor health statistically have significant associations with food insecurity [11].

Population aging is a global challenge for the social and economic development of the world. With advances in the health system, the overall population and, consequently, the older population worldwide have increased, particularly in the 21st century, thereby increasing the need to address this issue [12, 13]. It is estimated that over the next 30 years, the older population will comprise approximately 20% of the world's population, resulting in a total of two billion older individuals by 2050, meaning that for every five people in the world, one will be aged 65 or older [14].

Additionally, Iran, as a developing country, is also rapidly aging due to changes in various health policies over the past few decades [15]. According to the 2016 census of the Iranian Statistics Center, the total older population of the country is estimated to be 7,414,091 people,

and the number of older people in Guilan (the oldest province in the country) is 335,313 (163,438 men and 171,875 women) [16].

Considering the older population of Guilan Province in Iran, this study aimed to investigate food insecurity and socioeconomic factors affecting it among older people visiting comprehensive health centers in the east of Guilan.

Materials and Methods

The study sample for this cross-sectional analytical study consisted of 245 older individuals attending comprehensive health centers in East Guilan. The study sample size was determined based on the results of a similar study [2], which found that 43% of its samples experienced food insecurity (p=0.43, d=0.06, α=0.05). The sampling method employed a multi-stage cluster design. Six clusters were selected from the comprehensive health centers in East Guilan, located in 6 cities (Langerud, Lahijan, Astana, Rudsar, Siahkal, and Amlash). Then one center was randomly selected from each city. Then, the seniors in question were chosen systematically at random at each center.

The inclusion criteria were as follows: 60 years and older, willingness to participate in the study, having health records in comprehensive urban health service centers ability to answer questionnaires through interviews, score above 7 in the Abbreviated Mental Test (AMT) cognitive status test, and completion of the questionnaire.

The research tools included the demographic profile questionnaire, the Household Food Insecurity Access Score (HFIAS), the food security questionnaire, and the Socioeconomic Status (SES) questionnaire. Qualified samples were first assessed with the AMT instrument and entered into the study if they had normal cognitive status. AMT is a cognitive test, originally presented by Hodkinson. This test consisted of 10 questions assessing distant memory, close memory, attention, and orientation. The correct answer to each question scores 1, and an overall score lower than 7 indicates cognitive impairment [17]. The reliability and validity of the questionnaire in Iran were determined by Bakhtiari et al. in older adults [18].

The HFIAS food insecurity questionnaire (in terms of access) consists of 9 questions about the occurrence of food insecurity, followed by recurrence, ranked by severity of food insecurity (in terms of access). For each question (phrase), 4 response options are considered about the number of times the situation has been experienced, including asking how many times (0=never, 1=rarely [once or twice], 2=sometimes [three to ten times], 3=often [more than ten times] during the one-month time frame (30 days ago). In assessing food insecurity (in terms of accessibility) in the community, the data from this questionnaire can be used both quantitatively and qualitatively to evaluate food insecurity in the studied community. The HFIAS score is a continuous measure of an older person's food insecurity over the past month, derived from a total of occurrence codes answered by the older for 9 questions. The lowest score is 0, and the highest score is 27. The higher the elder's score, the more food insecurity they experienced. The household food insecurity access prevalence qualitative measure is also used to report the frequency of food insecurity (in terms of access) among older and regional decision-makers. This criterion divides the older population into 4 groups based on insecurity: Food-safe (0-1 points), food-insecure, including mild (2-7 points), moderate (8-14 points), and severe (15-27 points). The higher the number of positive responses of the older to the questions or the more frequently they experienced insecure situations, the more likely they were to be classified as insecure [19].

The SES questionnaire of powerhouse, which comprises four components: Income level, economic class, education, and housing status, along with a total of six demographic questions and five main questions. The measurement comparison of the questions in this questionnaire has five options, and the scoring method is in order from very low (1) to very high (5). Eslami et al. confirmed the validity and internal consistency of this questionnaire [20]. A researcher-made questionnaire, based on similar studies, was used to determine economic and social status [20, 21].

Data collection in this study began with the use of the AMT test in the first step to assess cognitive status. If there was no cognitive impairment, the subjects were included in the study. Following this, demographic characteristics (such as age, gender, marital status, education, occupation, and income), the HFIAS food security questionnaire, and the SES questionnaire were completed.

For statistical analysis, descriptive statistics were employed, and descriptive indicators such as Mean±SD, and univariate chi-square tests were utilized. The simultaneous effect of independent variables on severe food insecurity was shown through multiple logistic regression. Data analysis was performed using SPSS software, version 16.

Results

Two hundred forty-five older people, all of whom had an AMT score greater than 7, were included in the study. The sample consisted of 50.6% males and 49.4% females. The mean age of the samples was 67.66±6.059 years, and all were residents of the town. The occupational status of most people was as follows: 42.4% of households, 82% lived with their spouses, 81.2% were married, 50.6% had incomes above 315 USD, and 30.6% had a level of education below a diploma. About 61.2% had an underlying disease; most of them, 25.7%, had four children. In most households, 53.1% had at least one employed family member, and 34.3% had three or more people living together. Table 1 provides demographic information.

Table 2 shows that, in terms of SES, 74% of individuals with a very low SES experience severe food insecurity, while only 3.4% of those with a high or very high SES experience food insecurity. In terms of food security, 0.4% had complete food security, 11.8% had mild insecurity, 43.7% had moderate food insecurity, and 44.1% also had severe food insecurity.

For statistical analysis, descriptive statistics and descriptive indicators, such as Mean±SD, ratio, and univariate chi-square tests, will be used to illustrate the simultaneous effect of independent variables on severe food insecurity through multiple logistic regression (Table 3).

The results indicate that, at a 95% Confidence Level (CI), the relationships between food security and job status, marital status, living with others, income, education, the

Table 1. Distribution of socioeconomic characteristics of the sample (n=245)

Variables		No. (%)
Gender	Man	124(50.6)
	Female	121(49.4)
Residence	City	245(100)
Employment status	Retired	75(30.6)
	Employee	2(0.08)
	Farmer	35(13.3)
	Unemployed	6(2.4)
	Housewife	104(42.4)
	Freelance job	23(9.4)
Living with others	Single	14(5.7)
	With wife	201(82)
	With children	30(12.3)
Marital status	Single	2(0.8)
	Married	199(81.2)
	Isolated	4(1.6)
	Deceased wife	40(16.4)
Income (US USD)	<175	7(2.9)
	175-225	37(15.1)
	225-315	77(31.4)
	>315	124(50.6)

Variables		No. (%)
Educational level	Illiterate	74(30.2)
	High school	75(30.6)
	Diploma	69(28.2)
	College education	27(11)
Number of employed persons in the household	0	13(5.3)
	1	130(53.1)
	2	80(32.7)
	3	19(7.7)
	4	3(1.2)
Situation of socioeconomic	Very low	123(50.2)
	Low	93(38)
	Medium	28(11.4)
	High and very high	1(0.04)

number of family employees, and the number of people living together are statistically significant. However, the relationship between food insecurity and gender, underlying disease, and number of children is not significant. A significant relationship exists between SES and an individual's food security (P=0.01). The mean food insecurity index is 14.37±5.123. At a 95% confidence level, the relationship between food security and situation of socioeconomic (OR=1.839, 95% CI, 1.497, 2.338, P=0.001), marital status (OR=0.589, 95% CI, 370,0.938, P=0.001), income (OR=2.202, 95% CI, 1.541, 2.974, P=0.001), education (OR=1.735, 95% CI, 1.127, 2.669, P=0.001), the number of family workers(OR=1.411, 95% CI, 1.054, 1.876, P=0.001) were significant.

Discussion

This study aimed to determine the relationship between food insecurity and its socioeconomic factors in older patients referred to comprehensive health centers in East Guilan.

In a study, those hospitalized were mostly 75 years of age or older and widowed. Those who were hospitalized were more likely to have a lower education level

Table 2. Distribution of food security status according to employment status (n=245)

Variables	No(%)		Total
	Food Insecurity		
	Mild and Moderate Food Insecurity	Severe Food Insecurity	
Retired and employed	54(70.1)	23(29.9)	77(100)
Farmer	9(25.7)	26(74.3)	35(100)
Unemployed	0(0.0)	6(100)	6(100)
Housewife	51(49)	53(49)	104(100)
Self-employed	15(65.2)	8(34.8)	23(100)
Total	129(52.7)	116(47.3)	245(100)

Table 3. Predictors related to food security based on the logistic regression model

	Variables	B Regression Coefficient	SE	P	Odds Ratio	95% CI	
						Lower	Upper
Final model	Marital status (married to single)	0.529	0.237	0.026	0.589	0.370	0.938
	Income (top to bottom)	1.602	0.341	0.002	2.202	1.541	2.974
	Education al level (top to bottom)	1.551	0.22	0.012	1.735	1.127	2.669
	Number of employed persons in the household	0.888	0.254	0.001	1.411	1.054	1.876
	Situation of socioeconomic	1.081	0.328	0.001	1.839	1.497	2.338
	Constant	8.313	1.255	0.001	4076.348		

or lower income than those who were not hospitalized [22], which aligns with our results. However, in the other study, no significant differences were observed between the two groups in terms of age, sex, or marital status. There was also no significant difference between the two groups in terms of household size and number of employed persons [23]. In another study, it was shown that people with older age, more children, lower income, and a life without a spouse (living alone or with children) had poorer nutritional status [24]. However, in the Seivwright et al. study, despite low income being the strongest and most consistent predictor of food insecurity in previous studies, the study found no significant differences in food insecurity between people of different genders, cultural identity, education level, household composition, labor force participation status, and income source which is incoherent with the results of the present study [25].

The present study was in line with Placzek's study, which showed that socioeconomic and demographic factors play an important role in shaping the (unhealthy) diet. Households with higher income and education levels typically consume less unhealthy food and more healthy food. Higher education levels increase the likelihood that people will be more aware of diet and nutrition, as well as how to prepare and cook food [26]. Additionally, other studies [27-29] have shown that SES is associated with food insecurity, which is consistent with the results of the present study. Bayat et al. found that 44.1% of the participants were food insecure, while 55.9% had high food security [30].

The study reveals high levels of food insecurity among older individuals with low SES, and significant positive associations are found with job status, living with others, income, education, the number of employed family members, and the number of people living together. Considering that nearly half of the study's sample suffered from severe food insecurity, it is also necessary to pay attention to this problem in this segment of the vulnerable population due to various factors significantly related to this issue. To reduce the food insecurity of older adults, policies covering this age group with age-appropriate food baskets and improving their mental health should be considered.

Several factors limited the present study. First, the economic situation could not be accurately calculated and was judged based on the opinions of the samples. Second, the main variable was assessed using a questionnaire, and all the limitations resulting from this data collection method are also present in our study. Notably, the older participants were asked about the past month, which may have resulted in a recall bias due to their specific recall conditions.

It is recommended that the relationship between food security and SES be examined in various regions and cities of Iran, as well as across different populations, and that the results from these regions and populations be compared. Further studies should be conducted across various age groups, and other food security and SES questionnaires should be utilized in future studies.

This study reveals that food insecurity is prevalent among older individuals with low SES. A significant positive relationship is found between food insecurity and employment status, living with others, income, education, the number of employed family members, and the number of people living together. Considering that nearly half of the older individuals studied suffered

from severe food insecurity, and also considering various factors that had a significant relationship with this problem in this study, the need to address this issue in this vulnerable population of society has become more urgent than ever. To reduce food insecurity among older adults, policies should be considered to provide them with food baskets tailored to their age and improve their mental health.

Ethical Considerations

Compliance with ethical guidelines

The study was approved by the Ethics Committee of Guilan University of Medical Sciences, Rasht Iran (Code: IR.GUMS.REC.1401.414). All ethical principles of research were observed in this article. At each stage of the study, research units could refuse to continue collaborating if they were unwilling to do so. Informed consent was obtained from all participants. They were also reminded that, if desired, the results of the investigation will be made available to them, and their information will be kept confidential.

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Authors' contributions

Data collection: Marziye Shabani; Data analysis: Zahra Atrkar Roshan; Draft preparation: Marziye Shabani, Parand Pourghane, and Marjan Mahdavi Roshan; Supervision: Parand Pourghane; Final approval: All authors.

Conflict of interest

The authors declared no conflict of interest.

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