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Food Insecurity Status and Its Associated Factors Among Residents of the City of Fasa (Southwest Iran), 2022

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Abstract

Background & Objectives: Due to the potential adverse effects of unbalanced food consumption on physical, social, and mental health, the careful monitoring and assessment of food insecurity and hunger is of critical importance. This study aimed to assess the prevalence of food insecurity and its associated factors among the residents of the city of Fasa in southwest Iran.

Materials & Methods: This cross-sectional, descriptive-analytical study was conducted during the second half of 2022 and included 715 households (comprising 2,867 individuals from an approximate population of 110,000 in Fasa). A cluster sampling method was employed to select participants. Data on food insecurity were collected using a standardized questionnaire.

Results: The prevalence of food insecurity in this study was 42%. Moreover, food insecurity was found to be significantly associated with female-headed households, households headed by individuals with substance addiction, larger household size, and lower income levels. In contrast, no significant relationship was observed between food insecurity and smoking habits (cigarettes or hookah), educational background, or the employment status of either parent.

Conclusion: The findings of this study demonstrate that nearly half of the surveyed households experienced some degree of food insecurity, highlighting a significant public health concern in this region. Policymakers, along with health and development organizations, may utilize these results to develop targeted strategies aimed at mitigating the adverse impacts of food insecurity.

Keywords: Food insecurity, Prevalence, Fasa

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Introduction

Food security refers to a condition in which individuals have consistent and adequate access to nutritious food, enabling them to maintain

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a healthy life. Conversely, food insecurity is characterized by a lack of certainty or limited access to sufficient and nourishing food, as well as a reduced capacity to acquire food through socially acceptable means. This issue significantly impacts health and nutrition (1, 2). Food insecurity can lead to a range of negative outcomes, such as hunger, malnutrition, and adverse effects on overall health, immune system functionality, and quality of life (3, 4).

Food insecurity is a persistent global problem. According to a 2018 UNICEF (United Nations International Children's Emergency Fund) report, approximately 821 million people—equivalent to 12.5% of the global population—suffered from chronic hunger between 2014 and 2017, lacking sufficient food to lead a healthy and active life. According to this report, 65% of these individuals were from Asia (5). Iran is categorized as being at moderate risk for food insecurity, with approximately one-fifth of the population experiencing energy deficiency or a lack of satiety, and about half suffering from micronutrient deficiencies (6).

A study on food insecurity in Iran, based on household expenditure, revealed that 20% of the population faced economic barriers to accessing adequate food, while around 50% experienced challenges achieving cellular-level satiety. In essence, approximately 25% of Iranians had insufficient energy intake, and half of the population lacked essential micronutrients (7).

Various studies conducted among Iranian populations have examined the prevalence of food insecurity. For instance, a study by Yazdanpanah et al., which focused on rural households in Dashtestan County, Bushehr Province, found that prior to the Coronavirus diseases 2019 (COVID-19) pandemic, around 32% of families were experiencing food insecurity. However, during the pandemic, approximately 73.04% of the rural poor surveyed in the study experienced a worsening of their food insecurity levels. Notably, during this period, both financial (CV = 0.222) and psychological (CV = 0.228) factors had a more pronounced impact on rural families compared to their pre-pandemic food security levels (8).

Unbalanced food consumption can have serious consequences for individuals' physical, social, and mental health. Therefore, careful monitoring and evaluation of food insecurity and hunger in all regions is essential and must be prioritized. Accordingly, the primary objective of this study was to assess the prevalence of food insecurity and its associated factors among individuals residing in the city of Fasa, located in the southwestern region of Iran.

Materials and Methods

This cross-sectional study was conducted in the second half of 2022, involving households in the city of Fasa. The sample size was calculated based on a previously reported prevalence rate of 40.9% in Neyshabur in 2013 (1). With a 95% confidence level and a precision of 0.08 (equal to 20% of the prevalence), the minimum required sample size was estimated to be 360 households, which was then multiplied by a design effect of 2. As a result, the final sample size was determined to be 720 households.

Using a cluster sampling method, ten streets were randomly selected from a list of all streets in Fasa, with each street serving as a sampling cluster. Within each selected street, systematic random sampling was employed to choose 72 households per cluster. Data collection was conducted through household visits, during which two questionnaires were administered. The first questionnaire captured demographic variables, while the second was a validated six-item food insecurity questionnaire designed to assess food insecurity status (8).

Question 1: In the last 12 months, did you ever cut the size of your meals or skip meals because there wasn't enough money for food?

Question 2: If yes, how often did this occur? (Almost every month, some months but not every month, only 1 or 2 months)

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Question 3: In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money to buy food?

Question 4: In the last 12 months, were you ever hungry but didn't eat because you couldn't afford enough food?

Question 5: In the last 12 months, was it often, sometimes, or never true that the food didn't last and you didn't have money to get more?

Question 6: In the last 12 months, was it often, sometimes, or never true that you couldn't afford to eat balanced meals?

A total of 720 households were approached for participation. Only five households declined, resulting in a final sample size of 715 households for analysis. The mean age of participants in the food-secure group was 39.88 ± 7.76 years, while in the food-insecure group it was 39.20 ± 8.31 years, which was not statistically significant (p = 0.259). As shown in Table 1, approximately

Table 1. Demographic information of households that participated in the food insecurity research conducted in Fasa City in 2022

Variable		Frequency	Percent
Gender	Female	160	22.4
	Male	555	77.6
Family size	2-member family	32	4.5
	3-member family	214	29.9
	4-member family	265	37.1
	5-member family	133	18.6
	6 and more-member family	71	9.9
Fathers education level	Illiterate	4	6
	Elementary	14	2
	Secondary	20	2.8
	High school	236	33
	University	317	44.3
Mothers education level	Illiterate	17	2.4
	Elementary	17	2.4
	Secondary	41	5.7
	High school	228	31.9
	University	379	53
Fathers job	Unemployed	16	2.2
	Public	179	25
	Self-employed	415	58
	Deceased	24	3.4
Mothers job	Housewives	360	50.3
	Public	204	28.5
	Self-employed	148	20.7
	Deceased	3	4
Familial chronic disease	Yes	230	32.2
	No	485	67.8
Opium use	Yes	177	24.8
	No	538	75.2
Smoking	Yes	214	29.9
	No	501	70.1
Hookah use	Yes	187	26.2
	No	528	73.8
Alcohol consumption	Yes	158	22.1
	No	557	77.9

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77.6% of household heads were male. Regarding household size, four-member families were the most common, representing 37.1% of the sample. In terms of education, the majority of both males (44%) and females (53%) had attained a university-level education. Additionally, 83% of male participants were employed, while 5.7% were either unemployed or deceased. Among female participants, the majority (50.3%) were housewives.

The prevalence of certain health-related and behavioral factors was also assessed:

- 67.8% of participants reported no chronic illnesses,
- 75.2% reported not using drugs,
- 70.1% were non-smokers,
- 77.9% reported no alcohol consumption, and
- 73.8% did not use hookah.

The prevalence of food insecurity was significantly higher in households headed by women (68.1%), those with a history of drug use (63.8%), cigarette smoking (57.5%), and hookah smoking (58.3%), compared to other variables examined. Variables related to parental employment status and educational attainment also exhibited a statistically significant

Table 2. Comparison of household characteristics—including drug use, cigarette smoking, hookah smoking, alcohol consumption, presence of chronic disease, father's and mother's education levels, and parental employment status—between food-secure and food-insecure households in Fasa (2022)

Variables		Food security (%)	Food insecurity (%)	P-Value
Households	Male	321(57.8)	234(42.2)	<0.001
	Female	51(31.9)	109(68.1)	
Drug use	Yes	64(36.2)	113(63.8)	<0.001
	No	308(57.2)	230(42.8)	
Smoking cigarette	Yes	91(42.5)	123(57.5)	<0.001
	No	281(56.1)	220(43.9)	
Smoking hookah	Yes	78(41.7)	109(58.3)	<0.001
	No	294(55.7)	234(44.3)	
Alcohol consumption	Yes	88(51.3)	77(48.7)	0.806
	No	291(52.2)	266(47.8)	
Presence of chronic disease	Yes	118(51.3)	112(47.8)	0.071
	No	254(52.4)	231(47.6)	
Father's education	Illiterate	0(0)	4(100)	<0.001
	Elementary	3(21.4)	11(78.6)	
	Secondary	9(45)	11(55)	
	High school	108(45.8)	128(54.2)	
	University	201(63.4)	116(36.6)	
Mother's education	Illiterate	3(17.6)	14(82.4)	<0.001
	Elementary	4(23.5)	13(76.5)	
	Secondary	18(43.9)	23(56.1)	
	High school	105(46.1)	123(53.9)	
	University	230(60.7)	149(39.3)	
Father's job	Unemployed	8(50)	8(50)	0.006
	Public	118(65.9)	61(34.1)	
	Self-employed	209(50.4)	206(49.6)	
	Deceased	12(50)	12(50)	
Mother's job	Housewives	185(51.4)	175(48.6)	<0.001
	Public	131(64.2)	73(35.8)	
	Self-employed	56(37.8)	92(62.2)	
	Deceased	0(0)	3(100)	

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association with food insecurity. As parental education levels decreased, the prevalence of food insecurity among surveyed households increased. Furthermore, households in which either the father or mother was unemployed, or in which the mother was self-employed, demonstrated a higher prevalence of food insecurity (Table 2).

According to the findings presented in Table 3, households experiencing food insecurity reported significantly lower income levels and larger household sizes compared to food-secure households, and this difference was statistically significant.

Based on the results outlined in Table 4, after incorporating the relevant variables into the logistic regression model and adjusting for potential confounding factors, it was observed that female-headed households were 4.06 times more likely to experience food insecurity compared to male-headed households (95% CI: 1.73–9.48). Additionally, households with a head of household or another family member with a history of substance addiction were 2.51 times more likely to be food insecure (95% CI: 1.44–4.35). Each additional household member was associated with a 2.06-fold increase in the likelihood of food insecurity (95% CI: 1.62–4.63). Conversely, an increase in household income was significantly associated with a reduction in the likelihood of food insecurity. Smoking habits (cigarettes and hookah), educational attainment, and the employment status of both parents did not show a statistically significant association with food insecurity.

Discussion

The current study revealed a significant prevalence of food insecurity, with 42% of households in Fasa experiencing this condition. This indicates a relatively high rate of food insecurity within the studied population. Several studies conducted in Iran have reported varying prevalence rates. For example, in the study by Karam Soltan et al., the prevalence of food insecurity was 30.5% in Yazd (9), 50.5%

Table 3. Comparison of household size and income between food-secure and food-insecure households in Fasa (2022)

Variable status	Food insecurity		Lack of food insecurity		P-Value
	mean	SD	mean	SD	
Family size	4.1	1.1	3.8	0.8	0<001
Household income	88940290 Rials	49007600	162767120 Rials	153385370	0<001

Table 4. Logistic regression model of factors associated with food insecurity in Fasa (2022)

Variable	β	SE β	OR	95% C.I for OR		Wald	P-Value
				Lower	Upper		
Household gender(ref=male)	1.4	0.433	4.06	1.738	9.48	10.46	0.001
Drugs	0.918	0.218	2.51	1.44	4.35	10.61	0.001
Smoking	0.109	0.241	1.11	0.68	1.76	0.204	0.652
Hookah	0.445	0.255	1.56	0.95	2.58	3.04	0.079
Family size	0.726	0.122	2.06	1.62	2.63	35.15	0<0.001
Household income	-1.969E-7	2.4868E-8	0.998	1	1	63.19	0<0.001
Father's education	-0.168	0.198	0.84	0.57	1.24	0.719	0.397
Mother's education	0.053	0.178	0.94	0.66	1.34	0.089	0.736
Father's job	0.133	0.182	1.14	0.76	1.72	0.406	517.
Mother's job	0.230	0.990	1.26	0.88	1.80	1.602	0.201

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in Sari (10), 51% in Bandar Anzali (11), 59% in rural areas of Urmia (12), and 37.6% in Dezful. Additionally, in Mehdiabad, Shiraz, the prevalence was reported to be 74% (13).

These differences can be attributed to variations in economic conditions and access to food across regions. Furthermore, the timing of each study may influence the findings, as fluctuations in food prices and economic inflation can significantly impact household food security. It should also be noted that regional differences in the distribution of variables related to food insecurity may contribute to these discrepancies.

In general, the prevalence of food insecurity among Iranian households was reported to be 49% (95% CI: 40–59%) in a recent meta-analysis (14), which aligns with the findings of the present study. This consistent prevalence may be explained by shared economic, social, psychological, and cultural factors across the country. While no prior research has specifically focused on Fasa, it is likely that a combination of factors—such as droughts, the COVID-19 pandemic, declining income and employment rates, international sanctions, and inflation-induced economic recession—have contributed to food insecurity in this region.

The results of the present study showed a significant association between the gender of the household head, drug use by one or more household members, household size and income, and food security status. Conversely, cigarette and hookah smoking, parental education levels, and the employment status of both the father and mother did not show a significant relationship with food insecurity. The findings revealed that households headed by women experienced higher levels of food insecurity. This is consistent with a study by Sharafkhani et al., which suggested that gender inequalities in employment opportunities and unequal income distribution may contribute to this disparity (12). Similarly, a study conducted by Russell et al. in Australia supports the association between gender, income, and food insecurity (15). Furthermore, Catherine et al. (2022), in a recent study conducted in Canada, emphasized the synergistic impact of being female and experiencing food insecurity among women aged 40–60 years. They asserted that this synergy exacerbates their vulnerability, particularly with regard to mental health (15).

Research by Domingus et al. (2022) in Brazil also found that food insecurity in women was associated with both weight loss and obesity, a relationship that was not observed in males (16), which aligns with the findings of the present study. The impact of drug use on food security has been relatively understudied. Findings from a study by Dang et al. (2018), examining offenders receiving care on an American island, indicated that current drug use did not significantly impact food insecurity, according to logistic regression analysis. The difference in study samples—between criminal offenders under care and individuals within the general population—may explain the inconsistencies observed in the results (17). This finding aligns with an investigation conducted by Strike et al. (2012), which demonstrated that individuals with substance use disorders experienced higher levels of food insecurity (18).

In relation to household size, the findings of this study indicate that food insecurity tends to increase as the number of individuals within a household rises. This may be attributed to the fact that, as more people live together, the resources allocated per person decrease. Mansour et al. similarly found that both household size and income directly contribute to food insecurity; specifically, larger households with lower incomes are more likely to experience higher levels of food insecurity, which aligns with our findings (19).

However, our results were not consistent with those reported by Sharafkhani et al. (2012), whose research demonstrated a significant inverse relationship between household size and food insecurity. Their findings suggested that an increase in household size led to decreased levels

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of food insecurity (12). This discrepancy may be attributed to the fact that Sharafkhani et al.'s study involved a higher number of employed household members and, consequently, higher household incomes (12). Our results also highlighted the impact of household income on food insecurity: as household income increased, the likelihood of food insecurity decreased, and vice versa. These findings are consistent with research by Najafianzadeh et al. in Arak, which demonstrated a significant relationship between a family's economic status and its food security (20).

The study conducted in Shiraz by Ghasemzadeh et al. (2022) found a significant correlation between food insecurity and factors such as educational attainment, occupational class of the household head, and housing ownership status (13). Similarly, Najafianzadeh et al. (2013) in Arak identified a significant relationship between parental education and food insecurity (20). Another study by Kiehne et al. found that migrant and seasonal farmworker populations commonly experience food insecurity (21). Additionally, the study by Mendy et al. revealed a relationship between food insecurity in Africa and hypertension, diabetes, obesity, and smoking (22); however, our findings did not demonstrate a significant association between chronic disease and food insecurity. This inconsistency may be attributed to contextual differences between the respective studies.

Strengths and limitation of the study

The strengths of this study include its large sample size and a participation rate exceeding 99%. Among its limitations, it should be noted that the study was not conducted in rural areas and was restricted to urban households in the city of Fasa. Additionally, due to its cross-sectional design, causal relationships between food insecurity and associated variables cannot be established.

Conclusion

The findings of this study confirm the influence of economic, social, and cultural factors on food insecurity. Key contributors to food insecurity include economic crises, sanctions, inflation, recession, uncontrolled price increases, and regional droughts. Given that ensuring food security is a fundamental goal in socioeconomic development planning, it is imperative that multiple sectors work collaboratively to enhance food security both at the community level and specifically in Fasa City. Both short- and long-term strategies are needed, including poverty reduction initiatives and the provision of subsidized, nutrient-fortified foods for vulnerable populations. Furthermore, public health education programs should be implemented to increase community awareness of diverse nutritional options.

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Conflict of Interests

The author(s) declare no potential conflicts of interest with respect to the research, authorship, or publication of this article.

Ethical considerations

Ethical issues (including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Code of Ethics

Ethical approval for this study was granted by the Research and Technology Deputy of Fasa University of Medical Sciences under project code 99177, with ethics approval number IR.FUMS.REC.1399.154.

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Author's Contributions

S.A., F.M. and A.Gh. drafted the manuscript. A.D., F.Gh and R.H. revised the manuscript and improved its language; R.SH analyzed the data; and A.D., ZH.F. and R.Sh. designed the study. All authors approved the final version of the article.

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