

Food Insecurity Prevalence and its Related Factors in Households in Ahvaz, Iran

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ABSTRACT

Introduction: Household food security is defined as accessibility of adequate, safe and nutritious food for all people, at all times, to fulfill their dietary needs and food preferences for a healthy and active life. The primary aim of this study was to assess the prevalence of household food insecurity and related factors in Ahvaz, Iran. **Methods:** A total of 1,260 households from 20 health clinics in Ahvaz, Iran were identified for this cross-sectional study. Sixty-three women from each centre were selected randomly for the interview. A socio-demographic questionnaire and the USDA 18-item questionnaire on food insecurity were used for data collection. The data were analysed using the descriptive statistics and the Chi-square test and logistic regression. **Results:** Out of the total of 1,256 households, 440 (35%) were food secure, 422 (33.6%) had food insecurity without hunger, 294 (23.4%) showed moderate food insecurity while 100 (8.0%) had food insecurity with hunger. Families with lower income had a greater risk for food insecurity (OR= 16.773, CI= 7.98-35.24, $p<0.001$). Families with 1-3 children and families with a bigger dimension had greater risk for food insecurity (OR= 0.1666, CI= 0.076- 0.360, $p<0.001$) and (OR= 0.61, CI= 0.47-0.78, $p<0.001$) respectively. **Conclusion:** This study showed that the prevalence of food insecurity in Ahvaz, Iran is high due to the current tight economic situation faced by the people. As food insecurity over a long period could have serious deleterious effects, especially on children, the authorities should pay close attention to addressing this problem.

Key words: Food insecurity, households, Iran, prevalence

INTRODUCTION

Despite the adequacy of the world's food products to feed all people across the world, currently one in eight humans do not have enough to eat each day and it seems that we

will not be able to reach the Food and Agriculture Organization (FAO) goals to halve the undernourishment rate between 1990 and 2015. Based on FAO's reports between 2010-2012, the total number of worldwide undernourishment was 868

million people. Obtaining enough food for an active and healthy life for the whole nation for a developing country like Iran is one of the beautiful aims of FAO's programs (FAO, 2006).

Generally, food security is defined as accessibility to adequate, safe and nutritious food for all people, at all times, to fulfill their dietary needs and food preferences for a healthy and active life (FAO, 2006). A food insecurity condition arises when acquiring enough food in socially accepted ways is restricted. Accurate estimates of food security in the society can indicate the ability of people to access high quality food. Also it can indicate the extent of the problem of food insecurity, and, how people can stay healthy and participate in development activities (Smith & Subandoro, 2007).

Food insecurity can be measured in household or at individual level and one of the dependable modules to measure household security is USDA's questionnaire, the validity of which has been proven in the world as well as in Iran (Mohammadzadeh, Dorosty & Eshraghian, 2010; Payab *et al.*, 2012).

Consequences of food insecurity are irredeemable and several studies have illustrated associations between food insecurity and health hazards such as hypertension, diabetes and cardiovascular risk factors (Seligman, Laraia & Kushel, 2010). Also, household food insecurity can lead to tribulations in children's development (Rose-Jacobs *et al.*, 2008). It can also have adverse effects on mental health and skills as it can lead to parental depression and impair parenting practices (Bronte-Tinkew & Sazlow, 2007). Household food security is diagnosed when households have year round access to adequate and varied safe foods for maintaining a healthy and active life of its members. Further, food secured households should be able to retain adequate food either from their own products or through purchases (FAO, 2010).

Household socio-economic situation plays an important role in household food security. Sharafkhani's study in northwest of Iran revealed the prevalence of household food insecurity to be 40% with 20% of households suffering from very low food insecurity and this was positively correlated to family size, number of stores in the area and residential infrastructure. They also found a significant relationship between food insecurity and family car ownership, home situation, parent home situation and household income per month (Sharafkhani *et al.*, 2011).

Another study about household food insecurity in Iran in 2010 showed that 36.6% of households were food insecure and food insecurity had a direct relationship with family dimension, and a reverse correlation with parent's education level and job status (Mohammadzadeh *et al.*, 2010). Prevalence of food insecurity in 2010 in the Ray zone of Iran was 50.2% and education level of mother and household head and also house ownership had an inverse correlation with food insecurity (Payab *et al.*, 2012). However, according to FAO's latest research programmes in Iran (2006-2008), the rate of undernourished children was less than 5% (FAO, 2010).

Among other developing countries, Jordan had a 32.4% rate of food insecurity and the risk of being food insecure with inadequacy in all food groups (except grains) was directly associated with income below the poverty-line and being illiterate (Bawadi & Tayyem, 2012). In Brazil, household food insecurity rate in 2012 among 1529 female adolescents was 40.8%. Severe household food insecurity was independently associated with prevalence of excessive weight (Kac *et al.*, 2012).

To date there are no exact statistics about food insecurity in Ahvaz, Iran. The aim of this study was to evaluate the prevalence of food insecurity and related factors in Ahvaz, Iran.

METHODS

This cross-sectional study was conducted in Ahvaz, a city located in Southwest Iran. It has a population of 1,133,003 (2011) and is 140 square kilometers in size. The number of households in Ahvaz in 2011-2012 was 793,000. Most of the households selected for this study were headed by young women and men with low average income. This could be due to the selection of households from 20 health clinics in Ahvaz. The health clinics in Iran provide free reproductive health coverage for young families but this coverage is not offered for people before marriage and after menopause. As this study was conducted before the sanctions against Iran (before July 2010), the inflation rate was not too high. Most women in this study did not work and men were the sole breadwinners in the family. The Iranian government has not stated the poverty line during recent years, but according to unofficial records the poverty line for a family with 4 members in 2011 was 780,000 Tuman (equal to USD709). Based on our study findings, 522 (41.5%) who had ≥ 2 children were under the poverty line.

This study began in May and was completed in October 2012. This study was approved by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. Written informed consent was obtained from the participants prior to the study and their anonymity was maintained.

The participants were recruited from 20 health clinics in Ahvaz. Sixty-three women from each centre were selected randomly according to the odds and even numbers for health documents. This number was considered sufficient based on Ahvaz's population of 1,200,000.

The women were interviewed at the clinic. A socio-demographic questionnaire and the USDA questionnaire on food insecurity in the household were used for data collection (Bickel *et al.*, 2000). Internal validity of this questionnaire was assessed

on 2,004 Iranian households in Isfahan and results demonstrated acceptance of the questionnaire (Rafiei *et al.*, 2009). Reliability of the questionnaires was measured using the test re-test method and results revealed high reliability ($r=0.8$). Six qualified midwives who were trained by the researchers did all the interviews. Negative answers to questions 1, 2 and 3 revealed food security in families with children. Positive answers to questions 3, 4, 5, 6 and 7 indicated food insecurity without hunger. Positive answers to questions 8, 9, 10, 11 and 12 indicated moderate food insecurity with hunger. Positive responses to questions 13, 14, 15, 16, 17 and 18 indicated severe food insecurity with hunger (Bickel *et al.*, 2000).

Data analysis was carried out using the Statistical Package for Social Sciences (SPSS) version 19. Descriptive statistics was used for describing data. To assess the association of socio-demographic factors with food insecurity, the chi-square test and logistic regression were used. $p < 0.05$ was considered significant.

RESULTS AND DISCUSSION

A total of 1,256 questionnaires could be used as the data was complete; 4 questionnaires were discarded as they contained missing data. The sample consisted mainly of young men and women who had 1- 3 children. Based on household income, the families had low economic status. The socio-demographic characteristics of households are listed in Table 1.

Of the 1256 households, 440 (35%) were food secure, 422 (33.6%) had food insecurity without hunger, 294 (23.4%) had moderate food insecurity and 100 (7.96%) had food insecurity with hunger. Low income families had a higher rate of food insecurity, more children and did not own a house. There was a significant relationship between family income, number of children, family dimension, ownership of house and food insecurity (Table 2).

Table 1. Socio-demographic characteristics of households

Variables	Number of households= 1256	
	Mean \pm SD or N (%)	
Age of women (yr)	28.09 \pm 6.2	
Age of men (yr)	32.8 \pm 7	
Household income (\$)*	120422.6 \pm 4.09	
<240	295(23.5)	
241-400	443(35.5)	
401-800	327(26)	
>801	48(3.8)	
Marriage age (yr)	7.8 \pm 6	
Number of children		
0	70(5.6)	
1-3	1110(88.4)	
\geq 4	76 (6)	
Number of people in the family		
2-4	736(58.5)	
\geq 5	520 (41.5)	
Working women/men's job	84(6.7)	
Employer	826 (65.76)	
Employee	370 (29.44)	
Unemployed	60(4.8)	
Women's education		
Illiterate	64(5.1)	
Primary education	217(17.3)	
High school	330(26.3)	
Diploma	448(35.7)	
University education	197(15.6)	
Men's education		
Illiterate	48(3.8)	
Primary education	169(13.5)	
High school	306(24.4)	
Diploma	515(41)	
University education	218(17.3)	
Owner of the house	508(40.4)	
House rental (\$)	76 \pm 73	
Person for food purchasing		
Wife	474 (37.73)	
Husband	585 (46.6)	

* 143 families did not declare their income and 10 families claimed that they do not have any income

Logistic regression results showed that families with lower income had a greater risk of food insecurity (OR= 16.773, CI= 7.98-35.24, $p < 0.001$). Most families (1110: 88.4%) in this study had 1-3 children. Logistic

regression results showed that families with 1-3 children and large families had a greater risk of food insecurity (OR= 0.1666, CI= 0.076- 0.360, $p < 0.001$; OR= 0.61, CI= 0.47-0.78, $p < 0.001$), respectively (Table 3).

Table 2. The relationship of food security and insecurity with some socio-demographic factors

Variable s	Food secure n=440	Food insecurity without hunger n=422	Food insecurity with hunger, moderate n=294	Food insecure with hunger n=100	Test value	P value
N(%)						
Family income* (\$)						
<240	48 (11)	91(21.56)	108(36.73)	48(56.47)	+2=161.4	P<0.001
241-400	142(32.27)	169(40.04)	109(37.07)	23(27.05)		
401-800	160(36.36)	105(24.88)	48(16.32)	14(16.47)		
>801	36(8.18)	11(2.60)	3(1.02)	0		
Number of children						
0	38(8.63)	26(6.16)	4(1.36)	4(4)	+2= 40.7	P<0.001
1-3	388(88.18)	371(87.91)	266(91.09)	80(80)		
>4	14(3.19)	25(5.92)	22(7.53)	16(16)		
Household dimension						
2-4	300(68.18)	265(62.79)	169(57.87)	35(35)	+2=56.4	P<0.001
>5	140(31.81)	157(37.20)	123(42.12)	65(65)		
House owner						
Yes	222(50.45)	165(39.09)	93(31.84)	27(27)	+2= 36.6	P<0.001
No	218(49.54)	257(60.90)	199(68.15)	73(73)		

* 143 families did not declare their income, 10 families claimed that they do not have any income

Table 3. Logistic regression for family income, number of children, family dimension and food insecurity

Variables	B	SE	Wald	df	Exp(B)	P value	95% CI	
							Lower	Upper
Family income (\$)								
240-400	2.820	0.379	55.375	1	16.773	0.000	7.981	35.249
401-800	1.934	0.359	26.968	1	6.914	0.000	3.419	13.981
>801	1.216	0.362	11.295	1	3.375	0.001	1.660	6.860
Number of children								
1-3	-1.798	0.397	20.549	1	0.166	0.000	0.076	0.360
≥4	-1.012	0.322	9.874	1	0.364	0.002	0.193	0.683
Family dimension								
>5	-0.494	0.128	14.936	1	0.610	0.000	0.475	0.784

DISCUSSION

This study showed that; there was a significant relationship between family income, number of children, family size, ownership of house and food insecurity. In

a cross-sectional study conducted by Sharafkhani *et al.* (2010) in northwest Iran, results showed that among 2503 households, 59.6% were food insecure; he also found a significant relationship between family structure, size and food insecurity

($p < 0.05$). Although the study of Sharafkhani *et al.* used a briefer version of the USDA questionnaire consisting of six questions, our findings using the USDA questionnaire with 18 questions are in line with their findings. Our findings found the prevalence of food insecurity without hunger, moderate food insecurity, and food insecurity with hunger to be 33.6%, 23.4% and 7.96% respectively. Findings from another study in Northwest Iran on 300 subjects using the six-item version of the food insecurity questionnaire showed that only 32% of subjects were secure in terms of having access to all essential nutrients (Dastgiri *et al.*, 2007). Our findings are almost in line with the study of Dastgiri *et al.*, as we found that 35% of households were food secure.

A National Nutrition Survey in Pakistan revealed that only 42% of households were food secure while 9.8% of the 58% of households who were food insecure experienced severe hunger. The results also revealed that in rural areas, the rate of food insecurity was higher (60.6%) (National Nutrition Survey, Pakistan, 2011).

The study by Mohammadi *et al.* in 2001-2003 on 2,496 rural and 4,662 urban families in Iran, showed that 5.2%, 7.6% and 10.4% of families had severe, moderate and mild food insecurity. Their findings also showed that in urban areas, contrary to expectations, with lower family dimension, ownership of house and residential facilities, food insecurity increased (Mohammadi *et al.*, 2008). Our study was also conducted in an urban area in Ahvaz but unlike the findings of the study by Mohammadi *et al.* (2008), our findings found food insecurity to be at a serious level.

A study in Northwest Iran in 2011 showed that food insecurity level was 59.3%; the study also found a significant relationship between food insecurity and other factors, mainly economic factors (Dastgiri *et al.*, 2011). In Jordan, a study of 500 women found that 32.4% of the participants were from food insecure

families and of this, 43% suffered from hunger (Bawadi *et al.*, 2012).

This is the first time that the food security status of citizens in Ahvaz, Iran has been evaluated in a large cross-sectional study. The results of this study can be a basis for further studies and also for policy makers to consider the economic situation of citizens especially those with children. In this study, we collected data from 20 health clinics around the Ahvaz city, but it is believed that if we had approached families in their houses, we probably would have had better information.

CONCLUSION

Our study findings show that the household food insecurity in Ahvaz, Iran is high due to the low economic condition of the citizens. Because food insecurity especially over a long duration might have devastating effects, especially in children, authorities need to pay closer attention to this issue as it can prevent harmful effects on the young population.

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CONFLICT OF INTEREST

The authors state that they do not have any conflict of interest.

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