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Household food security status in the Northeast of Iran: a cross-sectional study

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Abstract

Background: An important issue the world faces today is ensuring that households living in different countries have access to enough food to maintain a healthy life. Food insecurity is prevalent in both developed and developing countries. The objective of this study was to assess the household food security status and related factors among different rural districts of Neyshabur (A city in northeast of Iran).

Methods: Of 5000 selected rural households 4647 were studied in this cross-sectional study. A validated short questionnaire (with six questions) was used to measure food security. Chi-square test and logistic regression were used for data analysis through SPSS software.

Results: In total, 2747 households (59.1%) were identified as food secure. The highest prevalence of food security was observed in Central district (62.3%) and the lowest was in Miyanjolgeh district (52.9%). Backward multiple logistic regression revealed that car ownership, presence of chronic disease in household and household income (per month) were significantly associated with food security in all of surveyed districts ($p< 0.05$).

Conclusion: According to results of this study, lower than 60% of Neyshabur rural households were food secure and economic variables were the most important factors. Therefore, a special attention should be paid to this health problem in these regions.

Keywords: Food security, Food insecurity, Household, Iran.

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Introduction

Food security is defined as access by all people at all times to enough food for an active healthy life (1). Therefore, the concept of food security includes: (a) the availability of food that is adequate, safe and nutritious; and (b) an assured ability to procure and acquire food of good quality in a socially acceptable way. Food insecurity could occur when food is not easily accessible and households have difficulty securing adequate food (2). When food insecurity occurs, household members begin to skip meals or otherwise cut back on the amount of food they consume, that this situation has considerable health impacts on the psychological, physical and social status of individuals in communities (3-5). Food and Agriculture Organization (FAO) estimates that %12 (842 million people) of the global population were unable to meet their dietary energy requirements in 2011–13. Thus, around one in eight people in the world do not have enough food for an active and healthy life. The vast majority of them (827 million) live in developing regions (6). "Food security is a complex condition which its dimensions (availability, access, utilization and stability) are better understood when presented through a suite of

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indicators" (6). Some surveys studied food security in Iran and they have found some variations of the prevalence of food security in different regions (7-9). Different factors may be related to food security, for example family size, family income, having children in the household, presence of both parents, number of centers that provide food, having a house, having a car, etc. For determining the related factors of food security, it is essential to first understand the status of food security in households and then to specify the related factors. The objective of this study was to assess the household food security status and related factors among rural households in Neyshabur (Northeast of Iran).

Methods

Data

This cross-sectional study was conducted on 5000 rural households that were selected from Neyshabur. Neyshabur is divided into four districts (Central, Zebarkhan, Sarvelayat and Miyanjolgeh) and each includes many villages. In this study, we used simple random sampling, thus we had rural households from different districts for analysis. Of all selected households, 4647 contributed to this study and others were excluded because of disagreement to contribute in study. Informed consent provided for all participating households after being acquainted with the purpose of study. In this study, questionnaires were filled out by trained interviewers; all participating households were informed that their responses would remain confidential.

Instrument

A validated household food security short questionnaire was used to measure the prevalence of food security of the surveyed households. This questionnaire was validated in Iran by Dastgiri, et al (10) and contains six items from the food security: 1. In the last 12 months, did you or any other in your household ever had to cut the size of meals or skip meals entirely because of no enough money for food? 2. If yes, how often did this happen? 3. In the last 12 months, did you ever eat less than enough because there was no enough money to buy food? 4. In the last 12 months, were you ever hungry but did not eat because you could not afford enough food? 5. The food that I/we bought just did not last, and I/we did not have money to buy more. Was this often, sometimes, or never true for you or the other members of your household in the last 12 months? 6. I/we could not afford to eat balanced meals. Was this often, sometimes, or never true for you or the other members of your household in the last 12 months? Households were classified as 'food-secure' if the respondent answered negatively to five or more of the six household food security questions. For questions number 1, 3 and 4, 'No' were considered negative responses, and for question number 2 'Only one or two months' was considered negative response. 'Never' was considered negative response for questions 5 and 6. In this study, food security was considered as dependent variable and the other data were considered as independent variables.

Statistical analysis

The data collected were analyzed using descriptive statistics including frequencies, ranges, means, and standard deviations (SD) through SPSS v.16 software. Logistic regression model was used to investigate the association between food security and other variables. Odds Ratio (OR) with 95% confidence interval (CI) was reported. Significant level was set as $p<0.05$.

Results

Of 4647 households, 1970 (42%) were selected randomly from Central district, 964 (21%) from Zebarkhan, 743 (16%) from Sarvelayat and 970 (21%) from Miyanjolgeh. The characteristics of study households are shown in Table 1 according to selected districts.

In total, 2747 households (59.1%) were identified as food secure. The highest prevalence of food security was observed in

Table 1.Characteristics of study households according to the surveyed districts (n = 4647)

	Central (n=1970)		Zebarkhan (n=964)		Sarvelayat (n=743)		Miyanjolgeh (n=970)	
Variables	n	%	n	%	n	%	N	%
Family size								
≤ 3	918	46.6	443	46	287	38.6	409	42.2
> 3	1052	53.4	521	54	456	61.4	561	57.8
Education level of head of family *								
< 12 yr	1777	90.2	905	93.9	680	91.5	922	95.1
≥ 12 yr	192	9.8	59	6.1	63	8.5	48	4.9
Age of head of family								
≤ 50 yr	1298	65.9	586	60.8	372	50.1	634	65.4
> 50 yr	672	34.1	378	39.2	371	49.9	336	34.6
Presence of children at home								
No	349	17.7	191	19.8	149	20.1	160	16.5
Yes	1621	82.3	773	80.2	594	79.9	810	83.5
Car ownership*								
No	1424	72.3	790	82	616	83	757	78.1
Yes	546	27.7	174	18	126	17	212	21.9
House ownership								
Tenant	240	12.2	97	10.1	88	11.8	59	6.1
Private house	1730	87.8	867	89.9	655	88.2	911	93.9
Presence of chronic disease in household*								
No	1612	81.9	760	78.8	563	76.1	711	73.3
Yes	357	18.1	204	21.2	177	23.9	259	26.7
Distance from the city								
≤ 30 km	1960	99.5	624	64.7	164	22.1	211	21.8
> 30 km	10	0.5	340	35.3	579	77.9	759	78.2
Number of centers that provides food								
< 2	554	28.1	216	22.4	152	20.5	310	32
≥ 2	1416	71.9	748	77.6	591	79.5	660	68
Presence of smoker in household*								
No	1465	74.4	764	79.3	574	77.3	708	73
Yes	504	25.6	200	20.7	169	22.7	262	27
Residential infrastructure*								
≤ 50 m^2	401	20.4	419	43.5	170	23.1	185	19.2
> 50 m^2	1567	79.6	545	56.5	567	76.9	780	80.8
Parentship status								
Single parents	271	13.8	128	13.3	155	20.9	122	12.6
Two parent	1699	86.2	836	86.7	588	79.1	848	87.4
Household income (monthly)*								
< 4000000 rial	1523	77.6	748	77.7	558	75.7	787	81.7
≥ 4000000 rial	439	22.4	215	22.3	179	24.3	176	18.3

*Some data were missing in these variables

Central district (62.3%, 95% CI: 60.9-63.7%) and the lowest in Miyanjolgeh district (52.9%, 95 CI: 51.5-54.3%) (Fig. 1).

Univariate logistic regression revealed that there was significant relation between some variables such as education level and age of head of family, car ownership, house ownership, presence of chronic disease in the household, presence of smoker in the household, distance from the city, number of centers that provide food, residential infrastructure, parentship status and household income per month with food security status in surveyed districts separately ($p<0.05$) (Table 2).

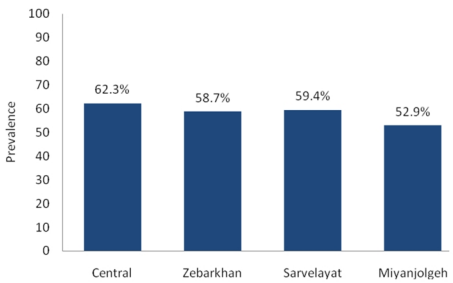

Fig.1. Household food security status according to the surveyed districts

Table 2. Odds ratio (OR) estimates based on the univariate logistic regression model according to the surveyed districts

Variables	Central				Zebarkhan				Sarvelayat				Miyanjolgeh			
	Food Security		OR	p	Food Security		OR	p	Food Security		OR	p	Food Security		OR	p
	yes n=1227	no n=743			yes n=566	no n=398			yes n=441	no n=302			yes n=513	no n=457		
Family size																
≤ 3	594	324	0.82	0.38	261	182	0.99	0.906	170	117	1.008	0.958	209	200	1.13	0.341
> 3	633	419			305	216			271	185			304	257		
Education level of head of family *																
< 12 yr	1083	694	1.92	<0.001	521	384	2.37	0.005	395	286	2.13	0.01	488	434	0.97	0.91
≥ 12 yr	144	48			45	14			47	16			25	23		
Age of head of family																
≤ 50 yr	842	456	0.73	0.001	364	222	0.7	0.008	221	151	0.995	0.976	359	275	0.65	0.001
> 50 yr	385	287			202	176			220	151			154	182		
Presence of children at home																
No	221	128	0.95	0.659	107	84	1.15	0.399	94	55	0.82	0.299	83	77	1.05	0.779
Yes	1006	615			459	314			347	247			430	380		
Car ownership*																
No	796	628	2.96	<0.001	433	357	2.68	<0.001	340	276	3.2	<0.001	357	400	3.05	<0.001
Yes	431	115			133	41			100	26			155	57		
House ownership																
Tenant	116	124	1.92	<0.001	47	50	1.59	0.030	38	50	2.1	0.001	15	44	3.54	<0.001
Private house	1111	619			519	348			403	252			498	413		
Presence of chronic disease in household*																
No	1063	549	0.43	<0.001	477	283	0.46	<0.001	362	201	0.42	<0.001	417	294	0.42	<0.001
Yes	163	194			89	115			76	101			96	163		
Distance from the city																
≤ 30 km	1223	737	0.4	0.145	392	232	0.62	<0.001	94	70	1.11	0.547	149	62	0.38	<0.001
> 30 km	4	6			174	166			347	232			364	395		
Number of centers that provides food																
< 2	288	266	1.82	<0.001	117	99	1.27	0.123	81	71	1.37	0.088	199	111	0.51	<0.001
≥ 2	939	477			449	299			360	231			314	346		
presence of smoker in household*																
No	948	517	0.68	<0.001	479	285	0.46	0.066	351	223	0.72	<0.001	405	303	0.53	<0.001
Yes	279	225			87	113			90	79			108	154		
Residential infrastructure*																
≤ 50 m^2	196	205	2.006	<0.001	209	210	1.91	<0.001	55	115	4.32	<0.001	55	130	3.34	<0.001
> 50 m^2	1030	537			357	188			382	185			457	323		
Parentship status																
Single parents	112	159	2.71	<0.001	65	63	1.45	0.05	81	74	1.44	0.43 ·	44	78	2.19	<0.001
Two parent	1115	584			501	335			360	228			469	379		
Household income (monthly)*																
<4000000 rial	848	675	4.66	<0.001	378	370	6.54	<0.001	287	271	3.29	<0.001	367	420	4.96	<0.001
≥4000000 rial	375	64			187	28			151	28			143	33		

*Some data were missing in these variables

Table 3. Odds ratio (OR) estimates based on the backward multiple logistic regression model according to the surveyed districts

District	Variables	B	OR	95%CI	p
Central	Car ownership	0.669	1.95	(1.52 , 2.5)	<0.001
	House ownership	0.527	1.69	(1.26 , 2.27)	<0.001
	Presence of chronic disease in household	-0.662	0.52	(0.40 , 0.67)	<0.001
	Number of centers that provides food	0.578	1.78	(1.44 , 2.22)	<0.001
	presence of smoker in household	-0.492	0.61	(0.49 , 0.77)	<0.001
	Parentship status	0.791	2.21	(1.66 , 2.94)	<0.001
	Household income (per month)	1.265	3.54	(2.63 , 4.77)	<0.001
Zebarkhan	Education level of head of family	0.726	2.07	(1.08 , 3.97)	0.029
	Car ownership	0.616	1.85	(1.23 , 2.78)	0.003
	House ownership	0.521	1.68	(1.07 , 2.66)	0.025
	Presence of chronic disease in household	-0.754	0.47	(0.34 , 0.66)	<0.001
	Distance from the city	-0.321	0.73	(0.54 , 0.97)	0.028
	Household income (per month)	1.729	5.64	(3.66 , 8.69)	<0.001
Sarvelayat	Car ownership	0.679	1.97	(1.19 , 3.26)	0.08
	Presence of chronic disease in household	-0.769	0.46	(0.31 , 0.69)	<0.001
	Residential infrastructure	1.365	3.92	(2.64 , 5.81)	<0.001
	Household income (per month)	1.412	4.10	(2.58 , 6.54)	<0.001
Miyanjolgeh	Car ownership	0.522	1.69	(1.15 , 2.47)	0.007
	House ownership	1.039	2.83	(1.44 , 5.54)	0.003
	Presence of chronic disease in household	-0.748	0.47	(0.34 , 0.66)	<0.001
	Distance from the city	-0.942	0.39	(0.27 , 0.56)	<0.001
	Number of centers that provides food	-0.600	0.55	(0.40 , 0.75)	<0.001
	presence of smoker in household	-0.685	0.50	(0.37 , 0.70)	<0.001
	Residential infrastructure	0.787	2.20	(1.50 , 3.23)	<0.001
	Household income (per month)	1.314	3.72	(2.41 , 5.74)	<0.001

Table 3 presents the results of backward multiple logistic regression according to surveyed districts; variables with significant relations were as follows: education level of head of family, car ownership, house ownership, presence of chronic disease in the household, presence of smoker in household, distance from the city, num-

ber of centers that provides food, residential infrastructure, parentship status and household income per month ($p<0.05$).

Discussion

The findings of this study indicated that 59.1% of surveyed rural households were food secure, thus more than 40% were food insecure. In Mohammadi' study conducted on 7158 households (2496 rural and 4662 urban) in Iran, it was observed that 87% of rural households and 71% of urban households were food secure (9). In Sharafkhani's study that conducted in the Northwest of Iran, it was observed that 40.4% of studied rural households were food secure and the others (59.6%) were food insecure (7). In Babatunde's study conducted in order to assess factors influencing food security status of rural farming households in north central Nigeria, it was observed that 36% of them were food secure and the others (64%) had experienced some degree of food insecurity (11). Also in Omotesho's study it was observed that 48.28% of rural Households in Kwara State, Nigeria were food secure and the others (51.72%) were food insecure (12). Therefore, the prevalence of food security has diversity in different studies. According to the different districts of Neyshabur, the highest prevalence of food security was observed in Central district (62.3%) and the lowest was in Miyanjolgeh district (52.9%). This result was not unexpected, because Central district is near to Neyshabur city and their households can provide food easier than households in Miyanjolgeh district that they are far from Neyshabur city. In this study, associated to revealed that some factors (education level of head of family, car ownership, house ownership, presence of chronic disease in household, presence of smoker in household, distance from the city, number of places that provides food, residential infrastructure, parentship status and household income per month) had efects on household food security of study population. However, three factors were common in all regions studied, including car ownership, presence of chronic disease in household and household income (per month). In this study, most factors are positively associated with food security in four districts (education level of head of family, car ownership, house ownership, residential infrastructure, parentship status and household income per month) and the household income (per month) is the most important one. As household income decreased, the food security also decreased in all districts. The findings of Bashir's study showed that household's monthly income and household head's education levels were positively associated to household food security but household heads' age and family size were negatively associated with household food security (13). The results of Omotesho's study that conducted to study Food Security and Poverty of the Rural Households in Kwara State, Nigeria, revealed that accessibility to health facilities; household size, farm size and household expenditure on food were the major determinants of a household's food security status (12). In Babatunde's study that conducted to examine the factors influencing the food security status of rural farming household in north central Nigeria it was observed that total annual income, household size, educational status of household's head and quantity of food obtained from own production were associated with household food security (11). Mohammadi conducted a study among Iranian households in the city of Tehran and identified low education and job level of household head and lower income as some of the major factors of food insecurity (14). In a study conducted by Sharafkhani it was observed that distance from the city, number of centers that provides food, family size, presence of both parents and residential infrastructure were related factors to food insecurity (15). The results of Omidvar' study showed that food insecurity was significantly more prevalent in households whose head and spouse had lower level of education, not owning their house and low socioeconomic status (SES) (16). In one study Dastgiri identified relat-

ed factors to food insecurity as: children at home, elderly people at home, education (head of family), car ownership, house ownership, monthly income, and parenting status (17). In Sheykholeslam's study also it was observed that the low level of education of the household head and spouse (mother) is one of the major predictors of household food insecurity (18). Influential factors in Furness' study were: income, children in household and past homelessness (19). As observed in this and other mentioned studies, educational level of the household head and household income are the main factors related to food security or food insecurity. According to these factors, cultural and economic interventions are suggested. A major limitation of this study was the use of a cross-sectional study design, which is not sufficient to determine causal direction. Despite this limitation, this study provides valuable information on food security among rural households in Neyshabur.

Conclusion

The results of this study provide insights into the prevalence and factors associated with food security among rural households in Neyshabur. According to the results of this study, more than 40% of rural households of Neyshabur suffered from food insecurity and this problem is more prevalent in households with low income. It also observed that prevalence of food security in four districts of Neyshabur was different but some of associated factors were common in these districts. According to these results, a special attention should be paid to rural households of Neyshabur.

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Conflict of interest

The authors have no conflicts of interest.

References

1. United States Department of Agriculture. Economic Research Service [Internet]. Food security in the United States: definitions of hunger and food security. Washington: USDA; 2011. Available from: http://www.ers.usda.gov/Briefing/FoodSecurity/labels.htm [Accessed 16 September 2011].

2. The state of food insecurity in the world 2004: monitoring progress towards the World Food Summit and Millennium Development Goals. Rome: Food and Agriculture Organization; 2004. Available from: ftp://ftp.fao.org/DOCREP/FAO/007/Y5650E/Y5650E00.PDF [Accessed 13 September 2011].

3. Food and Agriculture Organization (FAO). [Cited 2009/3/29]; Available from: http://www.fao.org

4. World Health Organisation (WHO). [Cited 2009/3/29]; Available from: http://www.who.int

5. Alaimo K, Briefel RR, Frongillo EA Jr, Olson CM. Food insufficiency exists in the United States: Results from the third National Health and Nutrition Examination Survey (NHANES III). Am J Public Health. 1998;88:419-26.

6. FAO, IFAD and WFP. The State of Food Insecurity in the World 2013. The multiple dimensions of food security. Rome, FAO. 2013.

7. Sharafkhani R, Dastgiri S, Gharaaghaji R, Ghavamzadeh S, Didarloo A. The role of household structure on the prevalence of food insecurity. Eur J Gen Med 2010;7:385-8.

8. Mohammadzadeh A, Dorosty A, Eshraghian M. Household food security status and associated factors among high-school students in Esfahan, Iran. Public Health Nutr 2010;13:1609-13.

9. Mohammadi F, Omidvar N, Houshiar Rad A, Mehrabi Y, Abdollahi M. Association of food security and body weight status of adult members of Iranian households. Iranian Journal of Nutrition Sciences & Food Technology 2008; 3(2): 41-53.

10. Dastgiri S, Tutunchi H, Ostadrahimi A, Mahboob S. Sensitivity and specificity of a short questionnaire for food insecurity surveillance in Iran. Food Nutr Bull 2007;28:55-8.

11. Babatunde RO, Omotesho OA, Sholotan OS. Factors influencing food security status of rural farming households in north central Nigeria. Agric J 2007; 2(3): 351-7.

12. Omotesho OA, Adewumi MO, Fadimula KS. Food Security and Poverty of the Rural Households in Kwara State, Nigeria. Libyan Agric Res Cen J Int 2010; 1 (1): 56-5.

13. Bashir MK, Schilizzi S, Pandit R. The determinants of rural household food security: The Case of Landless Households of the Punjab, Pakistan, Working Paper 1208, School of Agricultural and Resource Economics, University of Western Australia, Crawley, Australia, 2012.

14. Mohammadi F, Omidvar N, Houshiar-Rad A, Khoshfetrat MR, Abdollahi M, Mehrabi Y. Validity of an adapted household food insecurity

access scale in urban households in Iran. Public Health Nutr 2012;15:149-57.

15. Sharafkhani R, Dastgiri S, Gharaaghaji Asl R, Ghavamzadeh S. Factors Influencing Household Food Security Status. Food Nutr Sci 2011;2: 31-4.

16. Omidvar N1, Ghazi-Tabatabie M, Sadeghi R, Mohammadi F, Abbasi-Shavazi MJ. Food insecurity and its sociodemographic correlates among Afghan immigrants in Iran. J Health Popul Nutr 2013; 31(3): 356-66.

17. Dastgiri S, Sharafkhani R, Gharaaghaji Asl R, Ghavamzadeh S. Prevalence, influencing factors and control of food insecurity: a model in the northwest of Iran. Asia Pac J Clin Nutr 2011;20: 613-17.

18. Sheykholeslam R, Abdollahi Z, Salarkia N, Kavehi Z, Abdollahi M, Kalantari N, et al. Food security assessment of urban Afghan refugee populations in Pakdasht, Iran. Tehran: World Food Program 2008. 38.

19. Furness BW, Simon PA, Wold CM, Asarian-Anderson J. Prevalence and predictors of food insecurity among low- income households in Los Angeles County. Public Health Nutr 2004;7: 791–4.