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# A Population-based Cross-sectional Study of Food Insecurity and the Influential Factors in Households in Kermanshah, Iran

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**ABSTRACT**

**Background:** Food security and access to sufficient healthy food are the basic needs of humans. Food insecurity may cause severe health and nutritional problems. Therefore, assessment of food security and the influential factors is essential in different communities. The present study aimed to determine the prevalence of food insecurity in the households in Kermanshah in the west of Iran.
**Methods:** This cross-sectional study was conducted at 1,185 households in Kermanshah city, which were selected from eight areas via cluster sampling. Data were collected using the questionnaire of the United States Agency for International Development (USAID). Data analysis was performed in SPSS version 16 using the Kolmogorov-Smirnov test, Pearson's correlation-coefficient, and Kruskal-Wallis test.
**Results:** In total, 69.5% of the households had food insecurity. Significant correlations were observed between food insecurity and family size, occupation status of the household head, number of rooms, monthly income, and education level ($P$= 0.001).
**Conclusion:** According to the results, food insecurity was highly prevalent in the families in Kermanshah. Therefore, planning and implementation of interventional programs by organizations are recommended for better food access and improving the quality and quantity of food consumption in families.

## 1. Introduction

Food security is defined as a state in which all individuals have physical and economic access to sufficient and nutritious food at all times in order to meet their dietary needs for a productive and healthy life [1]. In other words, food security is the ability to receive sufficient food to live a healthy and dynamic life [2]. Food insecurity leads to nutritional and non-nutritional problems, which adversely affect public health. Economic conditions could influence food security in every community. According to statistics, more than one billion individuals have inadequate diets, and at least two billion individuals suffer from micronutrient deficiencies [3]. These conditions have been

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reported in both developing and developed countries, accounting for 5-25% of the total population [4].

Epidemiological and nutritional studies have proposed several factors and implications in regards to food insecurity. It is associated with low intake of food and nutrients, physical and mental complications [5,6], poor control of chronic diseases [7], diminished academic performance, and various physiological and behavioral problems in children [8]. In adults, food insecurity may lead to the selection of diets with nutrient-poor, high-calorie diets, some of the main consequences of which are obesity and becoming overweight. Furthermore, such diets could lead to poor health, depression, high risk of cardiovascular diseases, diabetes, and hypertension, reduced responsiveness to treatment, and increased risk of infections [9]. With the approximate population of 80 million, Iran has undergone substantial economic, social, and political changes over the past decades, which have affected the food security of households. In addition, statistics suggest the high prevalence of food insecurity in some regions in Iran. According to two studies in this regard, the prevalence rate of food insecurity in the northeastern rural households and northwestern areas of Iran is 40.9% [10] and 59.3% (39% moderate food insecurity and 20% severe food insecurity) [3], respectively. Moreover, a recent meta-analysis of Iranian studies has indicated the questionnaire-based prevalence rate of food insecurity to be 49.2% (29.6% without hunger and 19.2% with hunger) [5].

Kermanshah is the ninth most populous city in Iran and the capital of Kermanshah province, with the population of over one million. It is the largest city in the Kurdish region of Iran and the most important city in the west of Iran. Kermanshah has a temperate, mountainous climate and is one of the most important agricultural centers in Iran, with most of its income depending on this sector. However, factors such as eight years of war with Iraq, limited water resources, and air pollution caused by the dust of deserts in Iraq have adversely affected this province. Recently, there has been significant migration from small towns to Kermanshah, which has increased settlements in the suburban areas of the province. With this background in mind, the population of Kermanshah has changes fundamentally, thereby affecting the dietary patterns of the population, as well as the health and nutritional status of the households in Kermanshah.

Given the importance of food insecurity and the subsequent nutritional and health-related problems and considering the lack of data in this regard in Kermanshah, the present study aimed to assess the status of food security in the households in Kermanshah.

## 2. Materials and Methods

This descriptive, cross-sectional study aimed to determine the prevalence of food insecurity in Kermanshah in the spring of 2016. Sample population was determined based on the cluster sampling of the urban districts, consisting of all the households in eight districts of Kermanshah. The sample size was estimated to be 1,185 individuals based on a previous study regarding the prevalence of food insecurity [3], with the accuracy of 0.03% at 95% confidence interval. Informed consent was obtained from the participants.

The Household Food Insecurity Access Scale ($_{V.3}$) ($HFIAS_{V.3}$) was used to determine household food security, which is a valid and reliable questionnaire in different countries [11,12], and its Iranian version has also been previously validated [13]. It is notable that the HFIAS is annually used in the United States as a routine procedure. The questionnaire consists of nine occurrence items that represent a generally increasing trend regarding the severity of food insecurity (access) and nine items on the frequency of occurrence. These items are addressed as a follow-up to each occurrence item in order to determine the frequency of the occurrence of each condition. Each item is addressed within a recall period of four weeks (30 days). Initially, the respondent is asked an occurrence question as to whether the condition in the question has taken place at all within the past four weeks (Yes/No). If the respondent selected the option 'Yes' to an occurrence question, a frequency-of-occurrence question was asked to determine whether the condition occurred rarely (once/twice), sometimes (3-10 times) or often (>10 times) within the past four weeks [11]. The items were focused on various domains, including 'worries about food', -'inability to eat the preferred foods', 'eating only few kinds of foods', 'eating foods they really do not want to eat', 'eating smaller meals', 'eating fewer meals per day', 'no food of any kind in the household', 'going to sleep hungry', and 'going a whole day/night without eating'.

The questionnaire was revised by local nutritionists in accordance with the ecological and native features of Kermanshah and completed by trained experts by referring to each household and interviewing the women in the households. The general questionnaire also consisted of data on demographic characteristics, monthly income, number of family members, place of residence, number of rooms, and education level of the parents.

In the food security questionnaire, scores zero and one were assigned to the items responded with 'No' and 'Yes', respectively. Each item was scored within the range of 0-3 (Rarely=1, Sometimes=2, Most Often=3), and the obtained scores were summed up. The total score range of HFIAS was 0-27 to indicate the degree of food insecurity [11]. The categories of food insecurity status included food security, mild food insecurity, moderate food insecurity, and severe food insecurity.

Data analysis was performed in SPSS version 16 using descriptive statistics, Kolmogorov-Smirnov test, Pearson's correlation-coefficient, Kruskal-Wallis test, and logistic regression analysis. In all the statistical analyses, *P* value of less than 0.05 was considered significant.

## 3. Results and Discussion

In total, 1,185 households were assessed, and the response rate was 75.89%. Table 1 shows the demographic characteristics of the studied households based on the food security status. According to the findings, the overall prevalence rate of food insecurity was 69.5%, and 30.5% of the households had food security. Significant correlations were observed between the household dimension, occupation status of the head of the household, number of homerooms, monthly income, and education level with the household food security status.

According to the results of the present study, higher monthly income was associated with the reduced prevalence of food insecurity.

**Table 1:** The socioeconomic characteristics based on food security status in Kermanshah households (n=1185)

| Variable | | Food secure 362 (30.5%) | Mild food insecure 225 (19.0%) | Moderate food insecure 271 (22.9%) | Severe food insecure 327 (27.6%) | *P*value |
|---|---|---|---|---|---|---|
| Family size | 1-3 | 211 (58.29) | 114 (50.67) | 143 (52.77) | | 0.001 |
| | 4 and more | 151(41.71) | 111(49.33) | 128(47.23) | | |
| Job-status of the head | Employee | 143(39.50) | 63(28) | 51(18.82) | | 0.001 |
| | Unemployed | 26(7.18) | 44(16.56) | 69(25.46) | | |
| | Self-employed | 185(51.10) | 107(47.56) | 144(53.14) | | |
| | Retired | 8(2.21) | 11(4.89) | 7(2.58) | | |
| Residency | In the city | 304(83.98) | 182980.89) | 216(79.70) | | 0.317 |
| | Around of the city | 58(16.02) | 43(19.11) | 55(20.30) | | |
| Number of Rooms | 1 | 91(25.14) | 78(34.82) | 125(46.13) | | 0.001 |
| | 2 | 241(66.57) | 135(60.27) | 127(46.86) | | |
| | 3 | 27(7.46) | 10(4.46) | 13(4.80) | | |
| | 4 | 3(0.83) | 1(0.45) | 6(2.21) | | |
| Income | Bad | 35(9.67) | 70(31.11) | 111(40.96) | | 0.001 |
| | Fairly | 202(55.80) | 129(57.33) | 136(50.18) | | |
| | Good | 125(34.53) | 26(11.56) | 24(8.86) | | |
| The Education Level of the Father | Under diploma | 94(25.97) | 80(35.56) | 139(51.29) | | 0.001 |
| | Diploma | 128(35.36) | 94(41.78) | 81(29.89) | | |
| | BA | 39(10.77) | 17(7.56) | 189(66.4) | | |
| | BS | 72(19.89) | 28(12.44) | 23(8.49) | | |
| | MSc and more | 29(8.01) | 6(2.67) | 10(3.69) | | |
| The Education Level of the Mother | Under diploma | 120(33.15) | 107(47.56) | 147(54.24) | | 0.001 |
| | Diploma | 124(34.25) | 72(32) | 86(31.73) | | |
| | BA | 33(9.12) | 14(6.22) | 10(3.69) | | |
| | BS | 70(19.34) | 28(12.44) | 25(9.23) | | |
| | MSc and more | 15(4.14) | 4(1.78) | 3(1.11) | | |

In addition, the unemployment of the family head was considered to be a risk factor for food insecurity, while higher education level and number of homerooms were positively correlated with the decreased prevalence of food insecurity (Table 2).

According to the obtained results regarding HFIAS, 21.01% of the households were sometimes worried about food, while 9.07% were often worried about food. Furthermore, 22.36% of the households were sometimes unable to eat their preferred foods, while 8.02% were often unable to eat their preferred foods. Also, 23.38% and 7.85% of the households sometimes and often ate only few kinds of food. The status of other responses is presented in Table 3.

In total, 69.5% and 30.5% of the studied households in Kermanshah were food insecure and secure, respectively. Food insecurity was significantly associated with the socioeconomic status in aspects such as household dimensions, occupation status, monthly income, and education level.

Kermanshah city is located in the west of Iran and has a population of over one million. Eight years of war between Iran and Iraq have had different effects on this area, such as inappropriate social conditions, unemployment, and mental problems in the community. According to the results of the present study, the prevalence of food insecurity in Kermanshah was moderate. In similar research, the prevalence of food insecurity in the married women in Zone (south of Ethiopia) [14] and young women in Boston (USA) [15] has been reported to be 60.5% and 32.3%, respectively. In another study by Baer et al. (2015) food insecurity was reported to be significantly associated with access to health centers, education level, housing, and income status [15].

In a six-month study conducted in the northwest of Iran, a training program was implemented in this regard, and at the outset, education level was reported to be effective in the reduction of food insecurity [4]. In another study performed in Isfahan, 34.2% of adults and 40.5% of children were reported to have mild food insecurity, while 6.6% of adults and 7.3% of children had severe food insecurity [16]. Another research demonstrated that the prevalence of food insecurity in the villagers of Nishabur (Iran) was 40.9%, which was significantly correlated with the education level and age of the household head, as well as the possession of a home and car, presence of chronic diseases in a family member, presence of a smoker in the family, distance from cities, and income status [17]. In the aforementioned studies, the methods applied for the assessment of food insecurity prevalence and the influential factors [15-17], as well as some other experiments [18-30], are almost similar to the current research, which also confirms our findings.

The number of homerooms shows the financial power of the household, and income status is considered a critical factor for food access and food security in the community. As such, families with higher economic and income status have wider food choices. In addition, education level may affect food choices and food security, while the occupation type and status could also be a strong predictor of food insecurity since it affects the income status and purchasing power of food [5]. The results of the present study are consistent with these data as the prevalence rate of food insecurity was observed to be higher in the households with an unemployed head.

Another research in this regard was conducted on 15-year-old students in Isfahan (Iran), and the prevalence of food insecurity was estimated at 36.6%. In line with our findings, food insecurity was significantly correlated with the number of the family members, occupation status, literacy level, income status, and housing [18]. Based on the findings of the current research, the prevalence of food insecurity in Kermanshah was higher compared to the other studies performed in Iran and other countries, which could be due to the differences in the geographical location, dietary habits, cultural background, and beliefs of the public.

The strengths of the present study were the simplicity and understandability of the questions, cost-efficient and rapid data collection, and assessment of various socioeconomic factors. However, the cross-sectional design of the study was its main limitation.

**Table 2:** Odds ratio (OR) and 95 % confidence intervals (CI) of the socioeconomic characteristics in Kermanshah households

| Variable | | Crude OR (95% CI) | *P*value | Adjusted OR (95% CI) | *P*value |
|---|---|---|---|---|---|
| Family size | 1 | 1.00 | - | 1.00 | - |
| | 4 and more | 1.50 (1.17, 1.93) | 0.001 | 1.50 (1.12, 2.01) | 0.007 |
| Job-Status of the Head | Employee | 1.00 | - | 1.00 | - |
| | Unemployed | 8.98(5.64, 14.29) | 0.001 | 3.30(1.91, 5.70) | 0.001 |
| | Self-employed | 2.06(1.54, 2.74) | 0.001 | 1.48(1.04, 2.12) | 0.029 |
| | Retired | 3.33(1.47, 7.56) | 0.004 | 2.11(0.86, 5.14) | 0.100 |
| Residency | In the city | 1.00 | - | 1.00 | - |
| | Around of the city | 1.14(0.82, 1.60) | 0.412 | 1.19(0.81, 1.75) | 0.371 |
| Number of Rooms | 1 | 1.00 | - | 1.00 | - |
| | 2 | 0.43(0.32, 0.57) | 0.001 | 0.69 (0.50, 0.95) | 0.026 |
| | 3 | 0.36(0.21, 0.62) | 0.001 | 0.68 (0.36, 1.28) | 0.231 |
| | 4 | 0.75(0.20, 2.84) | 0.680 | 0.95 (0.22, 4.18) | 0.948 |
| Income | Bad | 1.00 | - | 1.00 | - |
| | Fairly | 0.18(0.12, 0.27) | 0.001 | 0.29(0.19, 0.43) | 0.001 |
| | Good | 0.05(0.03, 0.08) | 0.001 | 0.08(0.05, 0.14) | 0.001 |
| The Education Level of the Father | Under diploma | 1.00 | - | 1.00 | - |
| | Diploma | 0.49(0.36, 0.76) | 0.001 | 0.81 (0.55, 1.19) | 0.298 |
| | BA | 0.31(0.19, 0.49) | 0.001 | 0.85 (0.47, 1.54) | 0.612 |
| | BS | 0.24(0.16, 0.36) | 0.001 | 0.77 (0.44, 1.35) | 0.377 |
| | MSc and more | 0.18(0.10, 0.33) | 0.001 | 0.61 (0.28, 1.32) | 0.212 |
| The Education Level of the Mother | Under diploma | 1.00 | - | 1.00 | - |
| | Diploma | 0.48(0.36, 0.65) | 0.001 | 0.77(0.53, 1.12) | 0.184 |
| | BA | 0.27(0.16, 0.46) | 0.001 | 0.72(0.39, 1.32) | 0.300 |
| | BS | 0.24(0.16, 0.36) | 0.001 | 0.67(0.40, 1.14) | 0.144 |
| | MSc and more | 0.22(0.10, 0.47) | 0.001 | 0.71(0.28, 1.78) | 0.473 |

**Table 3:** The response of Kermanshah households to questions of Household Food Insecurity Access Scale (HFIAS)

**Food secure, Mildly food insecure, Moderately food insecure, Severely food insecure**

| HFIAS Questions | Frequency | | | |
|---|---|---|---|---|
| | No | Rarely | Sometimes | Often |
| | N (%) | N (%) | N (%) | N (%) |
| Q1: Worry about food | 606 (51.14) | 223 (18.82) | 249 (21.01) | 107 (9.07) |
| Q2: Unable to eat preferred foods | 571 (48.19) | 254 (21.43) | 265 (22.36) | 95 (8.02) |
| Q3: Eat just a few kinds of foods | 53 (44.89) | 283 (23.88) | 277 (23.38) | 93 (7.85) |
| Q4: Eat foods they really do not want to eat | 700 (59.07) | 191 (16.12) | 210 (17.72) | 84 (7.09) |
| Q5: Eat a smaller meal | 714 (60.25) | 190 (16.03) | 213 (17.97) | 68 (5.74) |
| Q6: Eat fewer meals in a day | 865 (73) | 130 (10.97) | 133 (11.22) | 57 (4.81) |
| Q7: No food of any kind in the household | 906 (76.46) | 127 (10.72) | 103 (8.69) | 49 (4.14) |
| Q8: Go to sleep hungry | 1036 (87.43) | 68 (5.74) | 59 (4.98) | 22 (1.86) |
| Q9: Go a whole day and night without eating | 1072 (90.46) | 45 (3.80) | 48 (4.05) | 20 (1.69) |

**Supplementary Table**

| Questions of Food Security Questionnaire | Answer | Frequency | Frequency (%) |
|---|---|---|---|
| Question 1. Have you been worried about the shortage of foodstuffs in the past month? | Yes | 579 | 48.9 |
| | No | 606 | 51.1 |
| Question 2. Has it happened that you cannot eat the food you like due to limited financial or food resources? | Yes | 615 | 51.9 |
| | No | 570 | 48.1 |
| Question 3. Has it happened that you could not use a variety of foods due to the limited financial or food supplies? | Yes | 653 | 55.1 |
| | No | 532 | 44.9 |
| Question 4. Has it happened that you had to use special foods due to the limited financial and food resources as well as lack of access to other types of foods? | Yes | 487 | 41.1 |
| | No | 698 | 58.9 |
| Question 5. Has it happened that you had to consume less food than you needed due to a lack of enough food? | Yes | 475 | 40.1 |
| | No | 708 | 59.9 |
| Question 6. Has it happened that you had to eat fewer numbers of meals in a day because you had not enough food? | Yes | 321 | 27.1 |
| | No | 864 | 72.9 |
| Question 7. Has it happened to you that no food of any type was available at home due to the resource constraints of food? | Yes | 279 | 23.5 |
| | No | 906 | 76.5 |
| Question 8. Has it happened that you had to sleep hungry at night as there was not enough food? | Yes | 149 | 12.6 |
| | No | 1036 | 87.4 |
| Question 9. Has it happened that you did not eat food all day long due to a lack of food? | Yes | 114 | 9.6 |
| | No | 1071 | 90.4 |

## 4. Conclusion

According to the results, household food insecurity in Kermanshah was moderate. In addition, a significant, negative correlation was observed between food insecurity and socioeconomic status. Therefore, it is recommended that practitioners, planners, and policymakers pay special attention to the improvement of the food security status. Moreover, it is suggested that further investigations be conducted regarding the food security status based on different age groups and nutritional issues, such as dietary patterns, anthropometric indices, and clinical manifestations.

## Authors' Contributions

Y.P., S.M.N., and M.D.M., conceived and developed the idea for the article and revised the manuscript; Y.P., M.M., and S.R., contributed to data collection; Y.P., M.D., and S.R.,

wrote numerous drafts; S.M.N., and M.D.M., contributed to statistical analysis; All the authors read and approved the final manuscript.

## Conflict of Interest

The Authors declare that there is no conflict of interest.

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## References

1. US Agency for International Development (USAID). Definition of Food Security. *USAID.gov*. Available from: URL: https://www.usaid.gov/ [Accessed 16 Oct. 2019].

2. Banach LP. Hospitalization: are We Missing an Opportunity to Identify Food Insecurity in Children? *Acad Pediatr*. 2016; 16(5): 438-45.

3. Barrett CB. Measuring Food Insecurity. *Sci*. 2010; 327(5967): 825-8.

4. Dastgiri S, Sharafkhani R, Asl RG, Ghavamzadeh S. Prevalence, Influencing Factors and Control of Food Insecurity: A Model in the Northwest of Iran. *Asia Pac J Clin Nutr*. 2011; 20(4): 613-7.

5. Daneshi Maskooni M, Shab Bidar S, Badri Fariman M, Aubi E, Mohammadi Y, Jafarnejad S, et al. Questionnaire-Based Prevalence of Food Insecurity in Iran: A Review Article. *Iran J Public Health*. 2017; 46(11): 1454.

6. Brewer DP, Catlett CS, Porter KN, Lee JS, Hausman DB, Reddy S, Johnson MA. Physical limitations Contribute to Food Insecurity and the Food Insecurity-Obesity Paradox in Older Adults at Senior Centers in Georgia. *J Nutr Elder*. 2010; 29(2): 150-69.

7. Seligman HK, Davis TC, Schillinger D, Wolf MS. Food Insecurity is Associated with Hypoglycemia and Poor Diabetes Self-Management in a Low-Income Sample with Diabetes. *J Health Care Poor Underserved*. 2010; 21(4): 1227-33.

8. Berkowitz SA, Basu S, Meigs JB, Seligman HK. Food Insecurity and Health Care Expenditures in the United States, 2011–2013. *Health Serv Res*. 2018; 53(3): 1600.

9. Ramsey R, Giskes K, Turrell G, Gallegos D. Food Insecurity among Adults Residing in Disadvantaged Urban Areas: Potential Health and Dietary Consequences. *Public Health Nutr*. 2011; 15(2): 227–37.

10. World Health Organization. Iran (the Islamic Republic of). *WHO*. Available from: URL: http://www.who.int/countries/irn/en [Accessed 16 Oct. 2019].

11. Coates J, Swindale A, Bilinsky P. Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access: Indicator Guide. *Washington, DC: Food and Nutrition Technical Assistance Project, Academy for Educational Development*; 2007. p. 34.

12. Gebreyesus SH, Lunde T, Mariam DH, Woldehanna T, Lindtjørn B. Is the Adapted Household Food Insecurity Access Scale (HFIAS) Developed Internationally to Measure Food Insecurity Valid in Urban and Rural Households of Ethiopia? *BMC Nutr*. 2015 D; 1(1): 2-10.

13. 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(1): 149-57.

14. Feyisso M, Belachew T, Tesfay A, Addisu Y. Differentials of Modern Contraceptive Methods Use by Food Security Status among Married Women of Reproductive Age in Wolaita Zone, South Ethiopia. *Arch Public Health*. 2015; 73(1): 38-46.

15. Baer TE, Scherer EA, Fleegler EW, Hassan A. Food Insecurity and the Burden of Health-Related Social Problems in an Urban Youth Population. *J Adolesc Health*. 2015; 57(6): 601-7.

16. Rafiei M, Rastegari HA, Ghiasi M, Shahsanaie V. Household Food Security in Isfahan Based on Current Population Survey Adapted Questionnaire. *Int J Prev Med*. 2013; 4(12): 1421-8.

17. Gholami A, Sani TR, Askari M, Jahromi ZM, Dehghan A. Food Insecurity Status and Associated Factors among Rural Households in North-East of Iran. *Int J Prev Med*. 2013; 4(9): 1018-24.

18. 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(10): 1609-13.

19. Parsavala S, Dorosty Motlagh A, Daneshi Maskooni M, Eshraghian M, Siassi F. Food Insecurity and Some Associated Socioeconomic Factors among High School Girls of Tehran. *Int Res J Appl Basic Sci*. 2013; 7(8): 508-11.

20. Badri Fariman M, Alavi A, Daneshi Maskooni M, Mirzaei K, Moeini A, Hosseini M. Food Security and Some Associated Factors among Women with Poly-Cystic Ovary Syndrome. *World Essays J*. 2016; 4(1): 35-9.

21. Daneshi Maskooni M, Badri Fariman M, Habibi N, Dorosty Motlagh A, Yavari H, Kashani A, et al. The Relationship between Food Insecurity and Esophageal and Gastric Cancers: A Case-Control Study. *J Res Health Sci*. 2017; 17(2): e00381.

22. Dorosty Motlagh AR, Safarpour P, Daneshi Maskooni M, Hosseini M, Ranjbar Noshari F. Food Insecurity and Primary School Girl Students' Intelligence Quotients: A Case-Control Study. *J Res Health Sci*. 2018; 18(2): e00411.

23. Najibi N, Dorosty Motlagh A, Sadrzadeh Yeganeh H, Eshraghian M, Daneshi M, Azizi S. Food Insecurity Status and Some Associated Socioeconomic Factors among Newly Diagnosed Patients with Type 2 Diabetes in Shiraz, 2012. *J Arak Univ Med Sci*. 2013; 16(1): 98-106.

24. Safarpour M, Dorosty Motlagh A, Hosseini SM, Ranjbar Noshari F, Safarpour M, Daneshi Maskooni M, et al. Prevalence and Outcomes of Food Insecurity and Its Relationship with Some Socioeconomic Factors. *Knowledge Health*. 2014; 8(4): 193-8.

25. Daneshi Maskooni M, Dorosty Motlagh AR, Hosseini SM, Zendehdel K, Kashani A, Safarpour M, et al. Food Insecurity and Some Associated Socioeconomic Factors among Upper Gastrointestinal Cancer Patients. *Int Res J Appl Basic Sci*. 2013; 4(2): 482-6.

26. Azizi S, Sadrzadeh Yeganeh H, Hosseini SM, Ahmadi A, Daneshi Maskooni M, Safarpour M, et al. Food Insecurity and Some Associated Socioeconomic Factors among Women with Metabolic Syndrome Referred to Clinics of Shiraz University of Medical Sciences. *Armaghane Danesh*. 2013; 18(2): 95-106.

27. Azizi S, SadrzadehYeganeh H, Hosseini M, Daneshi Maskooni M. Relationship between Food Insecurity and Metabolic Syndrome in Women. *Iran J Diabetes Metab*. 2014; 13(2): 144-52.

28. Najibi N, Firoozi R, Shahrezaee S, Eshraghian M, Daneshi Maskooni M, Dorosty Motlagh A. Food Insecurity is an Important risk Factor for Type 2 Diabetes: A Case-Control Study of New Referrals to the University Clinics, Shiraz, Southern Iran. *BMC Public Health*. 2019; 19(1): 885-92.

29. Daneshi Maskooni M, Dorosty Motlagh A, Hosseini SM, Zendehdel K, Kashani A, Azizi S, et al. Prevalence of Food Insecurity and Some Associated Socioeconomic Factors among Patients with Upper Gastrointestinal Cancers. *Med J Mashhad Univ Med Sci*. 2013; 56(1): 56-61.

30. Daneshi Maskooni M, Dorosty Motlagh AR, Izadi A, Kashani A, Azizi S, Bahreini M, et al. Is Food Security Associated to Nutritional Status among Hospitalized Cancer and non-Cancer Patients? *Int Res J Appl Basic Sci*. 2013; 5(6): 801-4.