Women. Health. Bull. 2020; 7(2)
Published online 2020 April.
Research Article

Is Unplanned Pregnancy more expected in Food Insecure Households? A Cross-sectional Study among Iranian Mothers

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Received February 18, 2020; **Revised** March 1, 2020; **Accepted** March 10, 2020

Abstract

Background: In developing countries, food insecurity is a serious problem associated with unplanned pregnancy. Very few studies have assessed the relationship between unplanned pregnancy and food insecurity. Therefore, the objective of this study was to examine this relationship in order to specify food insecurity determinants among Iranian women.
Methods: This cross-sectional study was conducted on 700 postpartum women in Tehran city, Iran. The samples were selected from ten community health centers. Demographic, socio-economic, and food security status data were collected by questionnaire (including 18-item USDA questionnaire), and analyzed in SPSS software version 22 via Chi-square test, independent sample T-test, and Logistic regression.
Results: A significant positive association existed between food security and family income (P<0.001, OR=0.994), education level of women (P=0.005, OR=0.211), home ownership (P<0.001, OR=3.099), ethnicity of Fars (P=0.009, OR=1.756), and planned pregnancy (P=0.035, OR=1.694). The association between food security and other variables (employment status of women and their husbands, family size, and age) was not significant.
Conclusions: Unplanned pregnancy among food insecure women was significantly higher than food secure ones. This indicates that women from food insecure household may need more family planning education and that families with unplanned pregnancy might require more support from the society or government in order to prevent food insecurity.

Keywords: Food security, Contraception, Ethnicity, Socio-economic status

How to Cite: Hojaji E, Zavoshy R, Noroozi M, Ezzeddin N. Is Unplanned Pregnancy more expected in Food Insecure Households? A Cross-sectional Study among Iranian Mothers. Women. Health. Bull. 2020;7(2):11-18.

1. Introduction

Food insecurity is a serious issue in developing countries (1). Food security refers to when "all people at all times have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (2). People with food insecurity often consume a poor diet of micronutrients, leading to the spread of obesity, cardiovascular disease, hypertension, diabetes, and other chronic diseases (3, 4). Micronutrient malnutrition has serious ramifications for the development of a country due to its long-term effects on health, cognitive performance, and labor productivity (5). The prevalence of food insecurity among Iranian women in Tehran, Iran has been reported to be 34.8% (6). In households of Zahedan, Iran; however, this prevalence was higher (58.8%). Overall, a systematic review estimated the prevalence of food insecurity at approximately 49.2% in Iranian populations (7).

The existence of food security is associated with factors at micro (such as lifestyle and eating habits) and macro level (culture) (8). It has been shown that unplanned pregnancy is associated with food insecurity (9). Moafi and colleagues reported a statistically significant relationship between unplanned pregnancy and food insecurity in pregnant women (10). Unplanned pregnancy is considered as a public health concern (11) with negative impacts on maternal and infant health (12–14) and economic status (15). Socio-economic status has been shown to be an important predictor of unplanned pregnancy among Iranian women (16).

Specifying food insecurity determinants is essential for proper policy intervention (7). Because food insecurity is affected by multiple factors, particularly structural determinants (17), family planning interventions may be more easily applicable as a strategy for combating household food insecurity (18). There are very few studies on the association between planned pregnancy and food security among Iranian

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Table 1: Classification of the household food security status based on the scores

Food security status	Number of positive responses*	
	Households without children under 18 years (Total Score:10)	Households with children under 18 years (Total Score:18)
Food secure	0-2	0-2
Food insecure without hunger	3-5	3-7
Food insecure with moderate hunger	6-8	8-12
Food insecure with severe hunger	9-10	13-18

*Positive responses, including "yes", "often true," "sometimes true," "almost every month" and "number of months," scored 1, while negative responses including: "only one or two months" or unanswered questions scored 0.

populations. Accordingly, in this study, we aimed to assess this relationship in order to specify food insecurity determinants for policy makers.

2. Methods

This was a cross-sectional study performed on 700 community health center referrals in northwest Tehran, Iran (10 community health centers). The study subjects were women who had referred after delivery (0-3 months) and had no (before pregnancy) history of chronic diseases (diabetes, cardiovascular disease, hypertension, and endocrine disease), trauma, or infection. Considering α=0.05, β=0.2, and d=0.05, the sample size was determined based on 23% prevalence of food insecurity in the study of Mohammadi and co-workers (19). Through convenience sampling, the women were selected from each community health center (proportional to size). Written informed consent was obtained from all the participants.

Demographic and socio-economic information, including the age, educational level, and employment status of the women and their husbands, family size, ethnicity, family income (monthly), and home ownership status, were collected via questionnaires. The women were further asked about whether or not their last pregnancy was planned. Unplanned pregnancy is defined as »a pregnancy that a woman was not actively trying to have, including pregnancies that are unintended, mistakes or accidents, unwanted, or not at the right time" (20). In order to evaluate the household food security status (over the past 12 months), the validated 18-item USDA questionnaire was employed. The validity and reliability of the Persian questionnaire was obtained via Hakim and colleagues, with 0.72 Cronbach's alpha (21). Table 1 shows the detailed information on scoring.

In this study, the Chi-square test, independent sample T-test, and Logistic regression were employed to analyze the data in SPSS software version 22; P values<0.05 were considered as statistically significant.

3. Results

Among the studied women, the prevalence of food security, food insecurity without hunger, and food insecurity with moderate and severe hunger was 65.1% (N=456), 25.4% (N=178), 8% (N=56), and 1.4% (N=10), respectively.

The demographic characteristics of the participants are presented in Table 2. The mean age of women was 30.1±4.5 (Table 2), and few subjects had employment (27.3%), middle school education or lower (8.9), and unplanned pregnancy (26.1%) (Table 2).

The association between household food security status and quantitative variables was analyzed by T-test (Table 3). The mean age of women and their husbands was significantly higher among the food secure group compared with the food insecure group (P<0.001). The family size of the food insecure group was significantly higher (P=0.005) while the monthly income of the food secure group was higher (P<0.001) (Table 3).

The relationship between household food security status and qualitative variables was analyzed by Chi-square test (Table 4). The educational level of women and their husbands was lower in the food insecure group (P<0.001). Employment in women was associated with food security (P<0.001) whereas self-employed husbands were more likely to be food insecure (P<0.001). Home ownership (P<0.001) was another predictor of food security among the households (Table 4).

The current study evaluated the relationship between the ethnicity of the women and household food security status. Due to the smaller number of other ethnic groups (Turks, Kurds, Lors), ethnicities other than Fars were combined with other ethnic groups. The results showed a significantly better status in Fars women compared

Table 2: The demographic characteristics of the participants

Quantitative variables	**(Mean±SD*)**
Age of women	(30.1±4.5)
Age of husbands	(34.1±5.1)
Family size	(3.5±0.6)
Family income ($)	(465.4±280.0)
Qualitative variables	**N (%)**
Employment status of women	
Housekeepers	509 (72.7)
Employment	191 (27.3)
Employment status of husbands	
Employee	328 (46.9)
Self-employed	372 (53.1
The education level of women	
Middle school or lower	62 (8.9)
High school degree	251 (35.9)
Bachelor's degree or higher	387 (55.3)
The education level of husbands	
Middle school or lower	81 (11.6)
High school degree	261 (37.3)
Bachelor's degree or higher	358 (51.1)
Home ownership status	
Owner	281 (40.1)
tenant or living with others	419 (59.9)
Ethnicity	
Fars	436 (62.3)
Others	264 (37.7)
Planned pregnancy	
Yes	517 (73.9)
No	183 (26.1)
Total number of participants	700 (100)

*SD=standard deviation

with other ethnicities (P<0.001). A significant positive association was further observed between planned pregnancy and food security (P<0.001) (Table 4).

The final logistic regression was used to assess the relationship between household food security status and significant variables (based on Tables 3 and 4), provided in Table 5. The results showed a significant positive association between household food security status and family income (P<0.001), education level of women (P=0.005), home ownership (P<0.001), having Fars ethnicity (P=0.009), and planned pregnancy (P=0.035) (Table 5).

4. Discussion

The current study was conducted on postpartum women referring to community health centers. The prevalence of household food insecurity among the studied women was 34.2%, and there was a significant positive association between food insecurity and unplanned pregnancy, maternal educational status, family income, home ownership status, and ethnicity.

Socio-economic status is an important predictor of household food security status (22). As a dimension of socio-economic status, income has a strong inverse relationship with food insecurity (23). Improved income and employment status are associated with better food security (24). The increase in family income increases the cost of the nutritious food basket (25). Coleman-Jensen and colleagues reported that in the United States (2014), about 40% of the households who earned annual incomes lower than 100% of the federal poverty level, were faced with food insecurity (26). The results of the current study showed a significant negative association between monthly households income and food insecurity, which is consistent with some studies (27, 28). Home ownership was another significant predictor of household food security status in the present study. Kirkpatrick and Tarasuk reported that households with housing costs (such as rent) higher than 30% of their income, were more likely to be food insecure (29). Households with higher rents, spend less money on food (30). Gholami and co-workers investigated the rural households of northeast Iran, observing a negative correlation between home ownership and food insecurity (27), which is also in line with the studies of Dastgiri and colleagues (31), Safarpour and colleagues (32), Rasty and co-workers (33), Kazemi and colleagues (34) and Moafi and co-workers (10), on the other hand, he did not find any significant association between home ownership and food insecurity. Over the recent years, providing affordable housing is targeted as a policy approach to reduce food insecurity, and more research is recommended regarding the efficiency of housing interventions in meeting the basic needs (29).

Table 3: The association between household food security status and quantitative variables

Variables	**Food secure**	**Food insecure**	**P value****
	Mean±SD*	**Mean±SD**	
Age of women	30.7±4.1	29.0±4.8	<0.001
Age of husbands	34.9±4.9	32.4±5.2	<0.001
Family size	3.4±0.6	3.6±0.7	0.005
Family income	565.2±280.7	278.8±156.1	<0.001

*SD=standard deviation; **T test

Table 4: The association of household food security status with qualitative variables

Variables	Food secure	Food insecure	P value***
	N (%)	N (%)	
Employment status of women			
Housekeepers	291 (57.2)	218 (42.8)	<0.001
Employment	165 (86.4)	26 (13.6)	
Total	456 (65.1)	244 (34.9)	
Employment status of husbands			
Employee	252 (76.8)	76 (23.2)	<0.001
Self-employed	204 (54.8)	168 (45.2)	
Total	456 (65.1)	244 (34.9)	
The education level of women			
Middle school or lower	6 (9.7)	56 (90.3)	<0.001
High school degreeBachelor's degree or	141 (56.2)	110 (43.8)	
higher	309 (79.8)	78 (20.2)	
Total	456 (65.1)	244 (34.9)	
The education level of husbands			
Middle school or lower	16 (19.8)	65 (80.2)	<0.001
High school degree	150 (57.5)	111 (42.5)	
Bachelor's degree or higher	290 (81.0)	68 (19.0)	
Total	456 (65.1)	244 (34.9)	
Home ownership status	240 (85.4)	41 (14.6)	
Owner, tenant, or living with others	216 (51.6)	203 (48.4)	<0.001
Total	456 (65.1)	244 (34.9)	
Ethnicity of women			
Fars	314 (72.0)	122 (28.0)	<0.001
Others	142 (53.8)	122 (46.2)	
Total	456 (65.1)	244 (34.9)	
Planned pregnancy			
Yes	367 (71.0)	150 (29.0)	<0.001
No	89 (48.6)	94 (51.4)	
Total	456 (65.1)	244 (34.9)	

* Chi-square test

Table 5: Final logistic regression model for the association of household food security status with variables

Variables	SE*	OR**	95 % C.I***		P value
			Lower	Upper	
Age of women	0.027	1.061	0.963	1.072	0.559
Education level of women					
Middle school degree or lower	-	Reference	-	-	-
High school degree	0.532	0.227	0.080	0.644	0.005
Bachelor's degree and higher	0.559	0.211	0.071	0.631	0.005
Employment status of women (Housekeeper)	0.291	0.698	0.395	1.234	0.216
Employment status of husbands (employee)	0.218	1.214	0.792	1.862	0.373
Family size	0.199	1.124	0.761	1.661	0.557
Family income	0.001	0.994	0.992	0.995	P<0.001
Home ownership status (owner)	0.234	3.099	1.960	4.902	P<0.001
Ethnicity (Fars)	0.216	1.756	1.149	2.683	0.009
Planned pregnancy (yes)	0.250	1.694	1.038	2.764	0.035

This table shows on the results of binary logistic regression for significant variables based on Tables 3 and 4, except for "husband's age" and "husband's education level", which were not considered due to their collinearity with the age and education of women, respectively.
* Standard Error; **Odds Ratio; ***Confidence Interval

Ethnicity was another predictor for household food security in the current study. Iran is a multi-ethnic country with differences in terms of culture, nutrition, and so forth (35). Nutrition has be shown to vary among different ethnic groups in the society (36), possibly due to the differences in the socio-economic status (37). Rezazadeh and colleagues assessed the prevalence of food insecurity in two Iranian ethnic groups (Kurds and Azeris) in Urmia city, northwest Iran, and showed a significant difference between the two groups in terms of food security (37). Similar results have been reported by Mortazavi and colleagues (38), Power and co-workers (39), Hakim and colleagues (21), and Rasty and co-workers (33). These results indicated the importance of considering ethnicity in food security promoting programs.

Unplanned pregnancy may put households under the risk of food insecurity (40). Patel and Surkan assessed the association between unwanted childbearing and food insecurity at nine months and two years after delivery. They found a significant positive association, particularly at 9 months, concluding that unwanted childbearing by increasing the family size, encounter parents with resource limitations, and lead to food insecurity (18). Although this pathway might be true, the current study did not assess the households food security status prior to pregnancy. Another hypothesis about the relationship between food insecurity and unplanned pregnancy is that the latter may occur more often in food insecure households. As shown in the study of Diamond-Smith and colleagues conducted in Nepal, women with low food security status were more likely not to use family planning (9). Feyisso and colleagues also reported that the use of modern contraceptive methods was significantly lower among food insecure women (29.7 %), compared with food secure ones (52.0 %) in Ethiopia (41). The results of the current study showed the higher prevalence of unplanned pregnancy among food insecure women. The studied women were up to three months postpartum and the used questionnaire assessed the state of food security up to a year prior to the study, Therefore, it might be concluded that women from insecure households have a higher chance of unplanned pregnancy. However, longitudinal studies can provide a more accurate causal relationship. The limitation of this study was that we examined the association between food insecurity and unplanned pregnancy but not causal relationship. It is recommended that future studies be conducted longitudinally so as to assess the causal relationship.

5. Conclusions

The results of the current study showed the significant positive association of food insecurity with maternal educational level, family income, home ownership status, and ethnicity, indicating the important role of Iranian women's socio-economic status in terms of food security. Unplanned pregnancy was significantly higher among food insecure women compared with food insecure ones, implying that women from food insecure household might need more family planning education. This also indicates that families with unplanned pregnancy may need more support from the society or government in order to prevent food insecurity.

Funding

This study was funded by Qazvin University of Medical Sciences, Qazvin, Iran.

Acknowledgement

This research was extracted from the master's thesis of Ms. Elham Hojaji and approved by the Research Council and Ethics Committee of Qazvin University of Medical Sciences. The authors would like to express their gratitude to the mothers who participated in the study and the health care staff for their cooperation in data collection.

Ethical Approval: This study was approved by the Research Council and Ethics Committee of Qazvin University of Medical Sciences, Qazvin, Iran. Also, written informed consent was obtained from all the participants.

Conflict of interest

The authors declared no conflict of interest.

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