

The Relationship Between Socioeconomic Factors and Food Security in Pregnant Women

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Abstract

Background: Food security is among the phenomena that have influenced the worldwide policy-making in the recent years. Furthermore, recent studies have reported extensive food insecurity in Iran.

Objectives: The present study aimed at defining the levels of food security and investigating its correlation with socioeconomic factors among pregnant women in city of Rasht (Iran) in 2014.

Methods: The present cross sectional study included 420 pregnant women in their 14 to 42 weeks of pregnancy. The sampling method was convenience, and the data were collected using demographic-obstetrics, socioeconomic factors, and food security status questionnaires through face-to-face interviews. The data were analyzed using SPSS 19.

Results: The results revealed that 30.9% of the pregnant women had food insecurity (19.6% had food insecurity without hunger, 8.9% had moderate hunger, and 2.4% had severe hunger), while 69.1% had complete food security. Food security was significantly correlated with socioeconomic status of the family, residence area, husband's occupation, number of employed family members, monthly income, and monthly food cost (P value < 0.001). The results of the logistic regression analysis revealed that husband's occupation (OR = 1.28), economic status (OR = 1.53), and residence area (OR = 1.43) had increasing effects on food insecurity.

Conclusions: Considering the high prevalence of food insecurity among pregnant women and its adverse impact on the mother and the fetus, it seems necessary to investigate the level of food security in women during prenatal care and to support pregnant women with food insecurity in particular.

Keywords: Food Security, Socioeconomic Factors, Pregnant Women

1. Background

Provision of food, as a basic need of the society, falls within food security domain (1), and it is among the phenomena that have influenced the worldwide policy-making in the recent years (2). According to food and agriculture organization of the United Nations (FAO) in 1996, food security is defined as having physical and economical access to enough healthy and nutritious food to meet the needs and food preferences at all times in order to have an active healthy life (3). Food security has 2 main prerequisites in every society: assurance of availability and accessibility of food, and assurance of ability of the family to obtain food (4).

Proper nutrition including balanced diet with physical activity is the pillar of an individual's health (5). According to the minimum required food, families with food security have access to enough food for the family members based on their age, gender, body size, physical activity, as well for pregnant and lactating women (6).

On the contrary, food insecurity is measured through

inadequacy of food and is defined as inadequate intake of food for constant supply of basic energy needs (7). Food insecurity and hunger do not only affect physical health but also might have adverse social and psychological effects.

Thus, provision of food security for the society is a major objective of socioeconomic development programs, and food insecurity is rooted in all political, economic, social, and geographical domains (8). Generally, macroeconomic and social policies influence price changes, income, occupation, and services. Each of these factors can affect family sources for providing food security (9, 10).

Evaluation of food security, especially among women, is of prominent importance because food insecurity in families is associated with deficiencies of micronutrients, fruits, and vegetables among women of childbearing age (11).

Nutrition during pregnancy is a major public health concern (12). Therefore, a guarantee to provide nutrients for pregnant women has become a fundamental focus in providing antenatal care (13).

Pregnant women are considered as vulnerable groups

in the society, thus, their food insecurity might cause side effects during pregnancy. Numerous studies have confirmed the importance of nutrition during prenatal and neonatal periods, however, very few studies have specifically studied the role of food security during these stages of life (14).

To maintain and promote the nutritional health of pregnant women, the following important ways can be used: (1) providing proper educational nutritional programs; (2) developing nutritional standards in health and disease period appropriate to the socioeconomic and cultural characteristics; and (3) performing appropriate interventions to solve problems and nutritional deficiencies of the people to reduce the burden of disease.

2. Objectives

Given the lack of studies focusing on food security among pregnant women in Iran, and considering the importance of this issue, the present study aimed at investigating food security and its association with socioeconomic factors among pregnant women in Rasht in 2014.

3. Methods

3.1. Research Design and Participants

The present cross sectional research included 420 pregnant women in their 14 to 42 gestational weeks. Using convenience sampling, the participants were selected from those women referring to Alzahra hospital in Rasht in 2014.

3.2. Selection Criteria

3.2.1. Inclusion Criteria Were as Follow

(1) Gestational age between 14 to 42 weeks; (2) absence of any specific disease such as diabetes, gestational diabetes, and high blood pressure before or during pregnancy, digestive diseases, etc.; (3) consent to be interviewed.

3.2.2. Exclusion Criterion Was as Follows

- (1) Lack of cooperation through the interview

3.3. Sampling

Using convenience sampling method, the participants were selected from those women attending to Alzahra hospital in Rasht in 2014. Consent was obtained from all the participants, and the aims of the study were explained to them. Furthermore, the participants were assured of the anonymity of the information. Then, the researcher completed a questionnaire.

Sample size was calculated using the following formula:

$$n = \frac{P(1-P)Z_{1-\frac{\alpha}{2}}^2}{d^2} \quad (1)$$

The $Z_{1-\alpha/2}$ =1.96, P was 0.44, α was 0.05 and d was 0.05.

3.4. Measurement Tools

The data were collected through face-to-face interviews using the following 3 types of questionnaires: demographic-obstetrics, socioeconomic status, and food security status.

3.4.1. Demographic-Obstetrics Questionnaire

Demographic-obstetrics data included pregnant woman's age, spouse's age, age at marriage, gestational age based on LMP (week), hemoglobin, hematocrit, weight 1month before pregnancy, weight gain during pregnancy, receiving prenatal care at the recommended time, eating enough food at every meal (feeling full).

3.4.2. Socioeconomic Status Questionnaire

This questionnaire had 19 questions about occupational status, level of education of the couple, residence, status of home ownership, the amount of rent or mortgage, house area, family economic status (evaluating eight items), family size, number of family members, ethnicity, insurance, receiving food aid, whether being supported by social organizations, monthly income, and total family expenditure. The economic status was assessed as poor, average, and good by having less than 3 items, 4 to 6 items, and more than 7 items, respectively. The validity of the researcher-made socioeconomic questionnaire was evaluated through content validity, and its reliability was assessed using internal consistency, Cronbach's alpha (0.876), and retest (0.916).

3.4.3. Food Security Questionnaire

The food security status was assessed using an 18-item food security survey developed by the U.S. department of agriculture (USDA). The scoring was based on Bickel et al. technique (15). The families were categorized as having food security, food insecurity without hunger, food insecurity with moderate hunger, and food insecurity with severe hunger according to their scores. The reliability of this questionnaire has been confirmed by previous studies in Iran (16).

3.5. Statistical Analysis

The data were analyzed in SPSS 19 by employing gamma, Mann-Whitney, Kruskal-Wallis, Spearman, and logistic regression. The quantitative data were measured using mean and standard deviation, while qualitative data were assessed using frequency and percentage.

4. Results

The participants aged 16 to 48 years (27.6 ± 5.8), with the gestational age of 14 to 42 weeks, and the mean weight gain of 9.6 kilograms. The highest frequency of education level of the participants and their husbands was high school (42.9%) and middle school levels (30.5%), respectively. Regarding income level, most of the participants (45.5%) had a monthly income of less than 400 000 Rials. Most of the participants (62.6%) lived in the urban areas and the rest lived in the rural areas (37.4%). The data on socioeconomic factors showed that most of the participants were homemakers (94.7%), and their husbands were self-employed (66.7%) (Table 1).

Of the pregnant women, 30.9% and 69.1% had food insecurity and complete food security, respectively. Food insecurity was higher among families without a child younger than 18 years compared to those families with a child older than 18 years (10.4% food insecurity with moderate hunger versus 8% in families with a child younger than 18) (Table 2). Statistical test results showed that food security was significantly correlated with factors such as socioeconomic status of the family ($\gamma P = 0.000$), house area ($P = 0.000$), husband's occupational status ($P = 0.002$), monthly income ($\gamma P = 0.000$), and monthly food cost ($P = 0.000$). The results of the regression analysis revealed that husband's occupational status as being a worker increased the odds of food insecurity by 28% compared to a self-employed husband. The families with poor economic status had 53% higher odds of having food insecurity compared to families with good economic status (Table 3).

5. Discussion

The present study reported the prevalence of food insecurity among pregnant women to be 30.9 in Rasht (Iran) and divided them into 3 groups of food insecurity without hunger, with moderate hunger, and with severe hunger. Another study reported food insecurity to be 51% among families of primary school students in Bandar-e Anzali (17). This difference might be explained by having children younger than 18 years and the climatic conditions of Rasht. The prevalence of food security in Shiraz was reported to be

Table 1. Distribution of the Participants' Demographic-Obstetrics Data

Variables	Mean
Pregnant woman's age	27.6 ± 5.85
Spouse's age	31 ± 6.7
Age between marriage to pregnancy	6.76 ± 5.69
Gestational age based on LMP (week)	31.48 ± 6.51
Hemoglobin	11.84 ± 1.27
Hematocrit	36.22 ± 3.53
Weight one month before pregnancy	67.43 ± 166.30
Weight gain during pregnancy	9.59 ± 6.17
	No. (%)
Receiving prenatal care at the recommended time	
Always	382 (91)
Often	24 (5.7)
Sometimes	9 (2.1)
Seldom	4 (1)
Never	1 (0.2)
Eating enough food at every meal (feeling full)	
Always	3 (0.7)
Often	337 (80.3)
Sometimes	54 (12.9)
Seldom	21 (5)
Never	5 (0.1)
Income level	
< 400 thousands Rial	191 (45.5)
400 - 800 thousands Rial	183 (43.5)
> 800 thousands Rial	46 (11)

33.3% in 2013 (18), while a study on female-headed households in Razan in 2013 reported different levels of food insecurity (19). Payab et al. estimated the prevalence of food insecurity among families of primary school students in Shahrerei to be 50.2% in 2010 (20). Another study found food security among people with gastrointestinal cancer to be 69.17% in 2011 (21).

A study conducted in Shiraz examined the relationship between food insecurity and metabolic syndrome in women. The results revealed 69.2% poor to severe food insecurity among the participants (22).

Hakim et al. (2010) reported the prevalence of food insecurity to be 37.6% among families in Dezful (23). Moreover, Dastgiri et al. estimated food insecurity to be 36.6% among families in Tabriz during 2004 to 2005 (24). Furthermore, food insecurity was estimated to be 36.6%

Table 2. Distribution Frequency of the Pregnant Women in Food Security Groups

Food Security Groups	All Families		With a Child Younger Than 18 Years		Without a Child Younger Than 18 Years	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Food security	289	69.1	186	70.5	103	66.9
Food insecurity without hunger	82	19.6	51	19.3	31	20.1
Food insecurity with moderate hunger	37	8.9	21	8	16	10.4
Food security with severe hunger	10	2.4	6	2.3	4	2.6
Total	418		264		154	

Table 3. The Results of the Logistic Regression in the 2 Groups of Food Secure and Insecure Pregnant Women in Rash in 2014

Variable	Standard Error	Odds Ratio	P Value
Spouse's occupation			
Employee	0.551	0.28	0.361
Worker	0.270	1.28	0.021
Self-employed [†]	-	(1 ref)	-
Socioeconomic status			
Poor	0.357	1.53	0.008
Average	0.511	0.494	0.237
Good [†]	-	(1 ref)	-
House area	0.005	1.43	0.046

among families in Isfahan in 2009 (25). Another study reported the prevalence of food insecurity as 32.4% and food security as 76.6% among women in Bangladesh (26).

However, few studies have examined food insecurity among pregnant women in other countries (27-30).

Laraia et al. (2006) reported the rates of marginal food security (15%) and food insecurity (10%) among low- and moderate-income pregnant women, which were lower compared with the broader North Carolina population. Moreover, it was found that North Carolina had a prevalence of 13.7% food-insecure households for the total population from 2001 to 2003 (31). Latinas experience rates of household food insecurity almost twice as high as the national level, with rates being reported as high as 46% among pregnant Latinas (30, 32).

The difference between food insecurity in Iran and other countries might be explained by various factors such as society politics, socioeconomic status, money paid for food, family size, the presence of children in the household, and place of living that affect people's access to food or food security.

A woman's nutritional status before and during preg-

nancy is an important environmental risk factor for adverse pregnancy outcomes, thus, ensuring a nutritious food supply for pregnant women has been a primary focus of prenatal care and federal government interventions, with the latter concentrating efforts on low-income pregnant women.

The difference between the levels of food insecurity in different studies in Iran might be due to the differences in target groups and environmental factors that affect food security of people living in those areas.

Knowledge of factors affecting food insecurity leads to a better understanding of households that may be affected by it. Many studies have confirmed the effect of socioeconomic and cultural factors on food security. Despite economic and physical access to food, many people exhibit inappropriate food behaviors and choices; this indicates the need for addressing sociocultural factors (such as family head's education level, employment and social status) and sociocultural status in addition to household share of food and income (33).

In various studies, age, education of the household head, the economic situation, losing a job, savings, being a

single parent, ethnicity, household size, and not receiving food aid are the factors that affect food insecurity (34).

The results of the present study revealed a statistically significant relationship between house area and food security. The results obtained by Sharafkhani et al. in Khoi and those of MohammadZadeh et al. in Isfahan confirmed the existence of a significant correlation as well (25, 35). Food security was also significantly correlated with the economic status of the family. This result was aligned with that of the studies conducted by Dastgerdi in Asad-Aabaad, Tabriz (1), Payab in Shahrerei (20), Safarpour et al. in Anzali (17), MohammadZadeh in Isfahan (25), and Ramesh et al. in Shiraz (16). No significant correlation was obtained between food security and family size of the participants.

Occupation of the pregnant women did not significantly affect food security, which can be explained by the fact that the husband is responsible for the financial management of the family, thus, women's employment does not financially influence the household (19).

The results obtained by Costa et al. in 2013 in Brazil confirmed the existence of a significant relationship between the level of education of the household head, the presence of juveniles in the family, the productivity of the farmers, and food insecurity (36). In another study, age, education of the household head, the economic situation, lacking a stable job, being a single parent, ethnicity, and an increase in household size, and eating habits were the factors affecting food insecurity (37). Moreover, the results obtained by Payab et al. in Shahrerei confirmed a significant relationship between household size, education, employment, and economic status with food insecurity (20).

No significant correlation was found between the number of children and food insecurity among women in Rasht, which is not in agreement with the results of the studies by Safarpour et al. in Anzali (17) and Ramesh et al. in Shiraz (16). This difference can be attributed to the fact that most participants in the current study had only 1 child or none at all, which did not significantly influence food security.

Income is a determining factor in food insecurity and hunger. The present study reported a significant correlation between income and food insecurity. Food insecurity and family income are closely related such that poor families are 3 times more prone to have food insecurity compared to others (38).

The results of previous studies on the relationship of personal and social factors with food security showed that all the above factors are linked together such that increasing household size threatens the provision of necessities of life, resulting in the emergence of food insecurity. Inadequate education restricts job opportunities and leads to reduced ability to generate income, which in turn affects

food expenditure. Moreover, poor education level leads to reduced nutrition literacy and affects all stages of basket-table process (purchase, preparation, cooking, and consumption), and this causes household food insecurity. The socioeconomic status of the household is the most important determinant of food insecurity. Thus, a sharp rise in the prices of some basic commodities could cause food insecurity, especially in households with incomes near the poverty line, so government policies should help create jobs and stabilize the prices. Therefore, considering the results, we suggest that the health care providers conduct educational sessions to promote nutritional literacy and nutritional programs for empowering women to manage their financial resources to meet the nutritional needs of the households.

A limited amount of previous work examined the food insecurity status of pregnant women; and our study was the first to measure food security in women during their pregnancy in Iran with a substantial sample size.

5.1. Conclusions

We studied the level of food security among pregnant women in the north of Iran for the first time. Considering the relatively high prevalence of food insecurity in the study participants and its adverse effects on the mother and the fetus, it seems necessary to evaluate the level of food security during prenatal care and to pay special attention to pregnant women suffering from food insecurity.

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Footnote

Conflict of Interest: There is no conflict of interest to be declared.

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