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Original Article

Nutrition Section

The Relationship between Social Support and Food Insecurity in Pregnant Women: A Cross-sectional Study

NASIBEH SHARIFI[1], MAHROKH DOLATIAN[2], ZOHREH MAHMOODI[3], FATEMEH MOHAMMADI NASR ABADI[4], YADOLAH MEHRABI[5]

ABSTRACT

Introduction: Household food insecurity has increasingly been recognized as a serious public health problem which is associated with higher rates of self-reported poor or chronic health conditions and also adverse impact on the mother and foetus.

Aim: The present study was aimed at identifying the relationship between social support and food insecurity in pregnant women.

Materials and Methods: This cross-sectional study was carried out on 734 pregnant women using Stratified cluster sampling in Ilam province in 2016. Some urban health centers were selected from each city and the samples that had the inclusion criteria were enrolled in the study in their 24-28 gestational weeks. Data collection tools were four questionnaires; women's demographic and obstetric characteristics, socio-economic status, food security status and social support questionnaires. Data were analysed using descriptive statistics and Chi-square test and logistic regression through SPSS version 19.0. The statistical tests were performed at 95% confidence interval.

Results: Food security was observed in 64.9% of participants while 35.1% suffered from insecurity. The results of assessing social support status indicated that 15.4%, 50.4% and 34.2% of the pregnant women had low, moderate and high social support, respectively. The chi-square test showed that there was significant association between social support and food security ($p<0.001$). The results of the logistic regression analysis revealed that social support was a protective factor against food insecurity as the probability of household food insecurity was lower for women with a higher level of social support compared to those with lower social support (OR: 0.187, CI: 0.116-0.303).

Conclusion: There was significant association between perceived social support and food insecurity. This highlighted the necessity of providing educational programs for spouses and families of pregnant women in order to support and alleviate food insecurity.

Keywords: Food security, Household food insecurity, Nutrient deficiency, Prenatal complications

INTRODUCTION

A balanced and adequate diet accompanied with physical activity is a basic human need which is essential for health and human health depends on food security [1,2]. Food security is defined as having access to sufficient food for a healthy life for all people at all times; this definition is based on four aspects of food availability, access to food, stability of food intake and usability [3]. In addition, food insecurity is defined as limited or uncertain access to adequate and safe foods in terms of nutrition or uncertain ability to acquire acceptable foods in socially acceptable ways [4,5]. Food insecurity is a complex phenomenon, which begins as concern about food at the household level and progresses until hunger appear among children [6,7].

According to FAO's report in 2013, 12.5% of the world's population (about 842 million); that is, 1 out of every 8 people, are suffering from chronic hunger that about 65% of them live in different parts of Asia [2]. Studies on pregnant women show different prevalence of food insecurity. Yadegari L et al., a prevalence of 30.9% while Laraia BA et al., reported the food insecurity prevalence of 24% [8,9]. Poor nutrition status during pregnancy can leads to prenatal complications [10,11]. Quality of nutrition has a considerable impact on pregnancy outcome. In addition, nutrient deficiencies can cause numerous problems for the mother, foetus and her infant (such as low birth weight, small for gestational age or stillborn) [12,13]. Food insecurity is related to various factors such as socioeconomic status (education, occupation and income), ethnicity, social support as one of the most important factors like providing food packages [14,15].

Social support can be informational, emotional, and companionship received from the person's social network, such as spouses, friends, family, neighbours, health personnel and other community members [16,17]. Social support during pregnancy plays a keyrole in the mother and baby's health and lack of it can lead to some medical and mental problems [18,19]. A number of important conclusions can be derived from surveying literatures concerning the relationship between social support and food security. Societies can support each other effectively, facilitate occupational opportunities. In addition, cooperation regarding food supply and sharing knowledge about ways of obtaining and utilizing food have been enhanced. Type of provided social support is different based on culture, ethic and socioeconomic status [20]. Researchers believe that social support program plays an effective role in the management of food security and reduce its vulnerability. Some programs such as insurance, emergency food aid and domestic productions are necessary to protect humans against food insecurity [21]. Walker JL et al., showed deep connections between social trust with health and food security. A reverse proportion has been revealed between social support and food insecurity which\directly affects health status [22].

Food security is considered as an indicator of individual and household health. The prevalence of food insecurity is different in various regions may be due to communities' policies, socio-economic status, etc. In addition, food insecurity can cause various problems such as developmental, health and nutritional problems [8,20]. For this reason, awareness of factors affecting food insecurity improves our understandings of what affects food

insecurity in families. Since, subjects were recruited from one province in Iran; this sample does not represent variation of all the country population. For this purpose, comprehensive study is necessary. In future, replicating such studies should be designed in other Iranian provinces and, comparison between these researches could be evaluated in the separate studies. This study aimed to identify the relationship between social support and food insecurity among pregnant women.

MATERIALS AND METHODS

This cross-sectional study was a part of the first author's PhD dissertation that was done from April 2016 to December 2016. The study population consisted of all pregnant women who met the following criteria. The inclusion criteria of this study were; being literate and being able to read and write in Farsi, Nulliparous and multiparous, in their 24-28 weeks of gestation (As we know the second trimester is the most convenient trimester of pregnancy and women have many concern in the other trimesters such as fear of abortion and preterm birth in the first and third trimester respectively. Such condition can obviously affect their response to study questions; on the other hand they attend health centers for performing some laboratory tests like GTT and Hb/Hct between 24-28 weeks of gestation. For this reason we considered this period as the best time for our study), Lack of known medical conditions, and Consent to participate in the study. Women with these characteristics were excluded: Lack of cooperation to participate in the study or not completing the study questionnaires.

Sampling was done using cluster random sampling. Ilam province in southwest of Iran has 10 cities with 197,896 women in reproductive age. All city in Ilam province were divided in five geographic regions (Central, North, South, East, and West) and each region was considered as a cluster. Health centers in each region were selected randomly for sampling. The appropriate sample size for each center was calculated and identified considering main sample size based on the number of prenatal documents. Since the number of prenatal documents covered by each urban health center was different, proportional random sampling was used to determine the sample size of the all centers. After explaining the purpose of research, informed consent was taken from the sabjects and they were assured that their information will remain confidential and they could leaves at any time they desired. If the subject had the inclusion criteria, they would be interviewed and questionnaires were completed by the participants.

Sample size was calculated using the following formula: $\mathbf{n} = \frac{Z^2 P(1-P)}{d^2}$ (n=669, P: 6%; d: 0.018) [18]. Considering subject attrition of 20%, the final sample size was estimated 837 participants. Also sample size was determined for each of the goals in thesis. The sample size determined for the relationship between the social support and food insecurity estimated 329 pregnant women with regard to the prevalence of 31% (P:31%, d:0.05) [6]. Also regarding to cluster sampling method and calculating the design effect equal 2, the sample size reached to 658 pregnant women. Given that the sample size determined for the main purpose of the thesis was higher than the target sample size, the larger sample size (837) was considered.

Data collection tools were four questionnaires. Demographic and obstetric characteristics; Socio-economic Status, Perceived social support and Household Food Insecurity Access Scale (HFIAS) questionnaires.

Demographic and Obstetric Questionnaire

Demographic and obstetric characteristics questionnaire was designed by the research team regarding women's pregnancy age, husband's age, ethnicity, gestational age, number of pregnancies, interval between pregnancies, the risk of chronic diseases (diabetes, hypertension), history of premature birth, low birth weight history, history of abortion, history of high birth weight over 4500 g and using supplements, etc.

Socio-economic Status Questionnaire

Socio-economic status questionnaire included 22 questions and was designed by the research team. It contained questions on pregnant mother's education, spouse's education, job, husband's occupation, the number of people living at home, the number of working people at home, monthly household income, individual's independent income, household expenses per month, type of housing and ownership type, etc.

The validity of the questionnaire was evaluated through face and content validity, and its reliability was assessed using internal consistency, Cronbach's alpha (0. 794). According to the Lavsheh table, the questionnaire had a high content validity, as mean of the relevance; questions' simplicity and clarity were 0.94, 0.98 and 0.98, respectively.

Perceived Social Support Questionnaire

Multidimensional Perceived Social Support Scale (MSPSS) is a 12-item scale, which measures perceived support in 3 domains: family, friends and a significant other. The scale consists of 12-items in which samples are classified into 3 groups of low, moderate and high social support. The lowest and highest scores for each question are 1 and 7, respectively. Total scores of answering the questions fall in three categories: Low (scores 12-48), Moderate (scores 49-68) and high (scores 69-84) social supports. Validity and reliability of this questionnaire have been approved by Zimet GD et al., for the first time, coefficient alpha for subscales and scale ranged from 0.85 to 0.91 that indicates good stability [23]. This instrument also has been validated in Iran by Bagherian-Sararoudi R et al., as Cronbach's coefficient has been found to be 0.92 for the scale and 0.89, 0.92 and 0.87, for the friends, significant others and family subscales, respectively [24].

Household Food Insecurity Access Scale (HFIAS)

The food security status was assessed using HFIAS, developed by USAID's Food and Nutrition Technical Assistance (FANTA) project used in measuring food security in each household. The scale consisted of 9 items in which samples were classified into 4 groups of food security, mild insecurity, moderate insecurity and severe insecurity. The lowest and highest scores for each question are zero and 3, respectively. Total scores of answering the questions fall in four categories: Food security (scores 0-1), Mild insecurity (scores 2-7), Moderate insecurity (scores 8-14) and Severe insecurity (scores 15-27) [25,26]. This instrument also has been validated in Iran by Mohammadi F et al., as the internal consistency of this questionnaire was 0.86 using Cronbach's alpha coefficients [27].

STATISTICAL ANALYSIS

Data were analysed using $SPSS_{19}$ software {IBM© SPSS© Statistics version 19 (IBM© Corp., Armonk, NY, USA)}. The Kolmogorov Smirnov test was used to determine normal distribution of data. Continuous variables were expressed as mean ± SD according to distribution state. Categorical variables were expressed as numbers and percentage. Relationships between social support and food security were assessed by inferential statistics including Chi-square, and logistic regression. A p-value of less than 0.05 was considered significant throughout the study.

Research Ethics

The Ethics Committee of SBMU approved the study design (SBMU. REC. 1394.112 dated September 7, 2015). Written informed consent was obtained from the participants after offering a comprehensive explanation of the study procedure.

RESULTS

Of 837 pregnant women, 103 were excluded from the study. So information was collected for 734 participants. The mean age of them was 28.73± 4.41 years (minimum and maximum ages of 18 and 35 years). The average number of pregnancies was 1.82±0.96 and 340 of the participants were primigravida. Considering the household members, 566 (77.2%) had 1 to 3 members. A total of 637 participants (86.8%) had one working person at home.

University graduated level had the highest frequency in participants and their husband's with 50.8% and 48.2% respectively. The lowest and highest frequency of women's career were self-employed 19 (2.6%) and Housewives 633(86.2%), respectively [Table/Fig-1].

Reviewing the status of participants' Social support classes showed that 15.4%, 50.4% and 34.2% had low, moderate and high social supports, respectively. In addition results indicated that the mean±SD scores of the three subscale of MSPSS including the significant other, family and friends were (23.03±4.56), (22.39±5.00) and (16.04±6.55), respectively [Table/Fig-2].

In terms of household food security, the majority of participants (64.9%) had food security, 24.9%, 7.3% and 2.9% had mild, moderate and severe insecurities, respectively [Table/Fig-2].

Chi-square test results showed significant association between food security status and Social support, women's education, husband's education, women's jobs, husband's jobs, family size, household income, the average household expenditure and residence area (p <0.001) [Table/Fig-3].

Binary logistic regression analyses were used in investigating the association of social support with food insecurity. [Table/Fig-4] presents the estimated Odds Ratios (OR) and 95% CI of binary logistic regression analysis. The results of the logistic regression analysis (unadjusted) revealed that social support was a protective factor against food insecurity. The probability of household food insecurity was lower for women with moderate and high social support compared to those with lower social support. Subjects with moderate and high social support had 66% and 82% lower odds of food insecurity than those with lower social support (CI=0.229 – 0.546, OR=0.345) and (CI=0.116 – 0.303, OR=0.187). After adjusted for women's age, husband's age, women's job, husband job, women's education, husband's education (Participants' Demographic Data and their husband), results revealed that social support was a protective factor against food insecurity and participants with high social support had 73% lower odds of food insecurity than those with lower social support (CI=0.162 – 0.455, OR=0.272).

Model 3 has been adjusted for women's age, husband's age, women's job, husband's job, women's education, husband's education, household income, family size, the average household expenditure and residence area (Participants' Demographic Data and their husband and household socioeconomic factors), the results revealed that social support was a protective factor against food insecurity and participants with moderate and high social support had 51% and 65% lower odds of food insecurity than those with lower social support [Table/Fig-4].

Variable		Mean (SD)
Women's Age		28.73±4.41
Husband's Age		33.41±5.47
Number of pregnancies		1.82±0.96
Variable		Number (Percent)
Women's education	Elementary	29 (4)
	Secondary	49 (6.6)
	High school	284 (38.7)
	University	372 (50.7)
Husband's education	Elementary	22 (3)
	Secondary	51 (6.9)
	High school	307 (41.9)
	University	354 (48.2)
Women's jobs	Housewives	633 (86.2)
	Employees	82 (11.2)
	Self-employed	19 (2.6)
Husband's jobs	Unemployed	12 (1.6)
	Employees	470 (64.1)
	Self-employed	252 (34.3)
Household income	Less than 10 million Rials	125 (17)
	10-20 million Rials	421 (57.4)
	More than 20 million Rials	188 (25.6)
The average household expenditure	Less than 10 million Rials	367 (50)
	10-20 million Rials	342 (46.6)
	More than 20 million Rials	25 (3.4)
Residence area	Less than 80 m^2	222 (30.2)
	80-120 m^2	328 (44.7)
	More than 120 m^2	184 (25.1)
Number of family members	1-3	566 (77.2)
	4 and above	168 (21.8)

[Table/Fig 1]: Characteristics of the participants at baseline.

Sub-scales of social support	Mean±SD
Significant other	23.03±4.56
Family	22.39±5.00
Friend	16.04±6.55
Total perceived social supports	61.46±13.26
Variable	Number (Percent)
Low social support	113 (15.4)
Moderate social support	370 (50.4)
High social support	251 (34.2)
Total	734 (100)
Food security	476 (64.9)
Mild insecurity	183 (24.9)
Moderate insecurity	54 (7.3)
Severe insecurity	21 (2.9)

[Table/Fig-2]: Distribution of the participants social support and food security classps.

DISCUSSION

The result of this study showed that the majority of participants (64.9%) had food security while 35.1% had food insecurities among them 24.9%, 7.3% and 2.9%, corresponded to mild, moderate and severe insecurity, respectively. Various studies have shown the prevalence of food insecurity in developed countries to be between 10 to 11.2% while the corresponding percentage is between 7.5 to 73% in developing countries [28,29]. In Iran, according to different scales of household food security measurements, the overall prevalence of food insecurity was reported in the range of 20-60%. This percentage rises to 86% in female headed and low household income. It can be claimed that these results are acceptable by considering the overall situation of food security in Iran [2]. The studies regarding food insecurity on pregnant women are limited. Laraia BA et al., reported that the prevalence of food insecurity was 15% [9]. Recently, Yadegari L et al., have reported the prevalence of 30.9% in Rasht [8]. Factors related to food insecurity, including age, education of household head, loss or lack of permanent jobs, increasing the number of family members, loss of supporting food package, ethnicity and region's eating habits [14]. In the present study, significant associations were observed between food security with parental education and occupation, family income and family size, while no significant relationship has been found between

Variable		Food security	Mild Food insecurity	Moderate Food insecurity	Severe Food insecurity	p-value
		Number (Percent)	Number (Percent)	Number (Percent)	Number (Percent)	
Women's Age	Less than 20 years	9(56.2)	6(37.5)	1(6.2)	0(0)	0.580
	20 to 30 years	287(66)	110(25.3)	27(6.2)	11(2.5)	
	31 to 35 years	180(63.6)	67(23.7)	26(9.2)	10(3.5)	
Husband's Age	20 to 30 years	157(64.1)	60(24.5)	20(8.2)	8(3.3)	0.897
	31 and above	319(65.2)	123(25.2)	34(7)	13(2.7)	
Women's education	Elementary	8(27.6)	15(51.7)	5(17.2)	1(3.4)	<0.001
	Secondary	21(42.9)	17(34.7)	6(12.2)	5(10.2)	
	High school	163(57.4)	83(29.2)	26(9.2)	12(4.2)	
	University	284(76.3)	68(18.3)	17(4.6)	3(0.8)	
Husband's education	Elementary	8(36.4)	10(45.5)	2(9.1)	2(9.1)	<0.001
	Secondary	20(39.2)	15(29.4)	10(19.6)	6(11.8)	
	High school	174(56.7)	96(31.3)	29(9.4)	8(2.6)	
	University	274(77.4)	62(17.5)	13(3.7)	5(1.4)	
Women's jobs	Housewives	398(62.9)	164(25.9)	50(7.9)	21(3.3)	0.021
	Employees	66(80.5)	15(18.3)	1(1.2)	0(0)	
	Self-employed	12(63.2)	4(21.1)	3(15.8)	0(0)	
Husband's jobs	Unemployed	1(8.3)	8(66.7)	1(8.3)	2(16.7)	<0.001
	Self-employed	272(57.9)	136(28.9)	45(9.6)	17(3.6)	
	Employees	203(80.6)	39(15.5)	8(3.2)	2(0.8)	
Family size	1-3	386(68.2)	130(23)	40(7.1)	10(1.8)	<0.001
	4 and above	90(53.6)	53(31.5)	14(8.3)	11(6.5)	
Household income	Less than 10 million Rials	33(26.4)	51(40.8)	27(21.6)	14(11.2)	<0.001
	10-20 million Rials	278(66)	111(26.4)	25(5.90)	7(1.70)	
	More than 20 million Rials	165(87.8)	21(11.2)	2(1.1)	0(0)	
The average household Expenditure	Less than 10 million Rials	190(51.8)	119(32.4)	40(10.9)	18(4.9)	<0.001
	10-20 million Rials	262(76.6)	63(18.4)	14(4.1)	3(0.9)	
	More than 20 million Rials	24(96)	1(4)	0(0)	0(0)	
Social Support	Low social support	44(38.9)	39(34.5)	18(15.9)	12(10.6)	<0.001
	Moderate social support	238(64.3)	104(28.1)	22(5.9)	6(1.6)	
	High social support	194(77.30)	40(15.9)	14(5.6)	3(1.2)	

[Table/Fig-3]: Relationship between food insecurity and participants' demographic-obstetrics and socioeconomic and social support in pregnant women based on Chi-square test.

Variable		B	S.E	OR	95% CI	P value
Model 1	Low social support	-	-	Ref	-	-
	Moderate social support	-1.039	0.221	0.345	0.229 – 0.546	< 0.001
	High social support	-1.675	0.254	0.187	0.116 – 0.303	< 0.001
Model 2	Low social support	-	-	Ref	-	-
	Moderate social support	-0.836	0.239	0.434	0.271 – 0.693	< 0.001
	High social support	-1.304	0.264	0.272	0.162 – 0.455	< 0.001
Model 3	Low social support	-	-	Ref	-	-
	Moderate social support	-0.701	0.256	0.496	0.301 – 0.819	0.006
	High social support	-1.042	0.282	0.353	0.203 – 0.613	< 0.001

[Table/Fig-4]: The Relationship between food insecurity and social support in pregnant women based on logistic regression test.

OR=Odd Ratio; CI= Confidence Interval; Ref=Reference group; S.E= Standard Error; B= Un Standard coefficient; Model 1: Unadjusted; Model 2: Adjusted for women's age, husband's age, women's job, husband's job, women's education, husband's education; Model3: Adjusted for women's age, husband's age, women's job, husband's job, women's education, husband's education, household income, family size, the average household expenditure, residence area

parental age and food security as people with higher education and income, lower household size, better socioeconomic status had food security which confirms the results of other studies [30-33]. It can be concluded, that by increasing parental education level, the knowledge, skills and attitudes regarding nutritional status will be improved. Furthermore, higher education provides better jobs and socioeconomic conditions [34,35]. Therefore, high quality nutrition will be more accessible. On the other side the number of children in the family is associated with increased training, school transportation, clothing and health care costs. The volume and number of food serving decreases by increasing household size, leading to food insecurity [7].

Researcher has also paid attention to the protective role, which a social support can have on household well-being, particularly the protective nature of social support on food security [36]. In this study, pregnant women had 15.4, 50.4 and 34.2 percent of low, moderate and high social supports scores, respectively. The mean score of perceived social support from husband, family and friends were 23.03±4.56, 22.39±5 and 16.04±6.55, respectively [Table/Fig-2]. The results revealed that the women in this study had high levels

of social support. Spouse support had the highest rating on social support which was consistent with the results of Bahiraii A et al., [37]. The average score of perceived social support was calculated to be 61.46±13.26. In the study by Jamshidimanesh M et al., in Iran the average score of perceived social support is estimated to be 60.55 among pregnant women. In addition, they showed that participants can get higher perceived social support from partners rather than family and friends [38], which confirms the results of the present study.

In this study, the logistic regression analysis showed that social support played a protective role in food insecurity and people with high social support had 82% less food insecurity than those with low social support. The proportion of food insecurity reached 73% by adjusting variables such as gender, age, education and occupation of parents. This reduced amount is due to the influence of the mentioned variables. It should be noted that these results are consistent with those of Miller ME, who demonstrated that people with high social support had less food insecurity (about 51%) [20]. Martin KS et al., who investigated the relationship between social capital and household food security in the US which showed that social capital was significantly associated with food security and households with higher levels of social capital are less likely to experience hunger [39]. In contrast to the work of Martin KS et al., in the US, Hadley C et al., conducted their study on the relationship between food security and perceived social support in rural Tanzania. They reported significant associations between food insecurity and both ethnic group and material wealth, in addition researchers revealed, that higher social support is associated with food security, suggesting that it may protect against the occurrence of seasonal food insecurity [36]. Findings of their study are in agreement with those of the present study.

A study in Nigeria in 2011 showed that the level of social capital through membership and access to formal and informal organizations is effective in improvement of social welfare, particularly poverty reduction and food insecurity [40]. In addition, Walker JL et al., showed that dimensions of social trust had deep connection to food security and health so that high social capital had inverse association with household food insecurity and was positively correlated with health status [22].

One of the strengths of this study is that we clearly observed the importance of the psychosocial aspects of food security, especially social support. Studying food security in pregnancy is necessary because of it's positive effects on pregnancy outcome. On the other hand the number of studies in this field is limited, and this study can be a beginning point for such studies in different populations. The limitation of this study was its cross-sectional nature. Therefore, it may not be realized that food insecurity is a temporary or chronic condition in the household.

CONCLUSION

The results of this study show that several factors such as socioeconomic and psychosocial factors, especially social support have significant relationships with household food insecurity. Therefore the design, implementation and evaluation of appropriate interventions about the food security in the individual and household levels are necessary by governments, policy makers and specialists. In addition social and cultural factors affecting food security must be studied on mother and foetus.

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REFERENCES

[1] Dastgiri S, Mahboob S, Tutunchi H, Ostadrahimi A. Determinants of food insecurity: a cross–sectional study in Tabriz. Journal of Ardabil University of Medical Sciences. 2006;6(3):233-39.
[2] Alimoradi Z, Kazemi F, Estaki T, Mirmiran P. Household food security in Iran: systematic review of Iranian articles. Journal of Shahid Beheshti School of Nursing & Midwifery. 2015;24(87):9103-15.
[3] Pinstrup-Andersen P. Food security: definition and measurement. Food security. 2009;1(1):5-7.
[4] Daneshimaskoni M, Dorostimotlagh A, Hosseini M, Zendehdel K, Kashani A, Azizi S, et al. The prevalence of food insecurity and socioeconomic factors involved in patients with upper gastrointestinal cancers. Medical Journal of Mashhad University of Medical Sciences. 2013;56(1):56-61.
[5] Kirkpatrick SI, Dodd KW, Parsons R, Ng C, Garriguet D, Tarasuk V. Household food insecurity is a stronger marker of adequacy of nutrient intakes among Canadian compared to American youth and adults. The Journal of Nutrition. 2015;145(7):1596-603.
[6] Ganapathy S, Duffy SB, Getz C. A Framework for Understanding Food Insecurity: An Anti-Hunger Approach. A Food Systems Approach http://www cnr berkeley edu/cwh/PDFs/Framework_Food_Insecurity_3. 2005;5.
[7] Ramesh T, Dorosty A, Abdollahi M. Prevalence of food insecurity in household of Shiraz and association with some of socioeconomic and population factors. Iranian Journal of Nutrition Sciences and Food Technology. 2010;4(4):53-64.
[8] Yadegari L, Dolatian M, Mahmoodi Z, Shahsavari S, Sharifi N. The relationship between socioeconomic factors and food security in pregnant women. Shiraz E-Medical Journal. 2017;18(1):1-6.
[9] Laraia BA, Siega-Riz AM, Gundersen C, Dole N. Psychosocial factors and socioeconomic indicators are associated with household food insecurity among pregnant women. The Journal of Nutrition. 2006;136(1):177-82.
[10] Wen LM, Flood VM, Simpson JM, Rissel C, Baur LA. Dietary behaviours during pregnancy: findings from first-time mothers in southwest Sydney, Australia. Int J Behav Nutr Phys Act. 2010;7(13):1-7.
[11] Delvarianzadeh M, Ebrahimi H, Bolbolhaghighi N. surveying pregnant women's nutritional status and some factors affecting it; in cases referring to Shahrood health-care centers. The Journal of Birjand Univ of Med Sci. 2007;13:42-49.
[12] Monafi M, Rabiipor S, Porheydar B. Study of food consumption among pregnant women referred to health centers in the city of Urmia. The Journal of Urmia Univ of Med Sci. 2003;4:253-61.
[13] Gernand AD, Schulze KJ, Stewart CP, West Jr KP, Christian P. Micronutrient deficiencies in pregnancy worldwide: health effects and prevention. Nature Reviews Endocrinology. 2016;12(5):274-89.
[14] Dave JM, Evans AE, Saunders RP, Watkins KW, Pfeiffer KA. Associations among food insecurity, acculturation, demographic factors, and fruit and vegetable intake at home in Hispanic children. Journal of the American Dietetic Association. 2009;109(4):697-701.
[15] Bocquier A, Vieux F, Lioret S, Dubuisson C, Caillavet F, Darmon N. Socio-economic characteristics, living conditions and diet quality are associated with food insecurity in France. Public Health Nutrition. 2015;18(16):2952-61.
[16] Abedian Z, Soltani N, Mokhber N, Esmaili H. Relationship between social support and postpartum depression in women with preeclampsia. IJOGI. 2015;17(136):10-18.
[17] Brummett BH, Mark DB, Siegler IC, Williams RB, Babyak MA, Clapp-Channing NE, et al. Perceived social support as a predictor of mortality in coronary patients: effects of smoking, sedentary behavior, and depressive symptoms. Psychosomatic Medicine. 2005;67(1):40-45.
[18] Shishehgar S, Mahmoodi A, Dolatian M, Mahmoodi Z, Bakhtiary M. The relationship of social support and quality of life with the level of stress in pregnant women using the PATH Model. Iranian Red Crescent Medical Journal. 2013;15(7):560-65.
[19] Ghosh JKC, Wilhelm MH, Dunkel-Schetter C, Lombardi CA, Ritz BR. Paternal support and preterm birth, and the moderation of effects of chronic stress: a study in Los Angeles County mothers. Archives of Women's Mental Health. 2010;13(4):327-38.
[20] Miller ME. Food security and social support: Exploring relationships between social resources and access to adequate food. Canada: School of Dietetics and Human Nutrition McGill University, Montreal, Canada; 2015:1-117.
[21] Devereux S. Social protection for enhanced food security in sub-Saharan Africa. Food Policy. 2016;60:52-62.
[22] Walker JL, Holben DH, Kropf ML, Holcomb JP, Anderson H. Household food insecurity is inversely associated with social capital and health in females from special supplemental nutrition program for women, infants, and children households in Appalachian Ohio. Journal of the American Dietetic Association. 2007;107(11):1989-93.
[23] Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. Journal of Personality Assessment. 1988;52(1):30-41.
[24] Bagherian-Sararoudi R, Hajian A, Ehsan HB, Sarafraz MR, Zimet GD. Psychometric properties of the Persian version of the multidimensional scale of perceived social support in Iran. International Journal of Preventive Medicine. 2013;4(11):1277-81.
[25] 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. 2007:1-34.
[26] Deitchler M, Ballard T, Swindale A, Coates J. Validation of a measure of household

hunger for cross-cultural use. Food and Nutrition Technical Assistance II Project (FANTA-2). 2010:1-76.
[27] Mohammadi F, Omidvar N, Houshiar-Rad A, Khoshfetrat M-R, Abdollahi M, Mehrabi Y. Validity of an adapted Household Food Insecurity Access Scale in urban households in Iran. Public Health Nutrition. 2012;15(01):149-57.
[28] Mohammadzadeh A, Dorosty A, Eshraghian M. Household food security status and associated factors among high school students in Esfahan, Iran. Public Health Nutrition. 2010;13(10):1609-13.
[29] Mohammadzadeh A, Dorosty Motlagh A, Eshraghian M. The association of food security with socio-economic factors and weight status among adolescents. Iranian Journal of Nutrition Sciences & Food Technology. 2010;5(1):55-62.
[30] Quandt SA, Shoaf JI, Tapia J, Hernández-Pelletier M, Clark HM, Arcury TA. Experiences of Latino immigrant families in North Carolina help explain elevated levels of food insecurity and hunger. The Journal of Nutrition. 2006;136(10): 2638-44.
[31] Chi DL, Masterson EE, Carle AC, Mancl LA, Coldwell SE. Socioeconomic status, food security, and dental caries in US children: mediation analyses of data from the National Health and Nutrition Examination Survey, 2007–2008. Journal Information. 2014;104(5):860-64.
[32] Hadley C, Patil CL. Food insecurity in rural Tanzania is associated with maternal anxiety and depression. American Journal of Human Biology. 2006;18(3): 359-68.
[33] Hadley C, Zodhiates A, Sellen DW. Acculturation, economics and food insecurity among refugees resettled in the USA: a case study of West African refugees. Public Health Nutrition. 2007;10(04):405-12.
[34] Jansen PW, Tiemeier H, Jaddoe VW, Hofman A, Steegers EA, Verhulst FC, et al. Explaining educational inequalities in preterm birth: the generation r study. Archives of Disease in Childhood-Fetal and Neonatal Edition. 2009;94(1): F28-F34.
[35] Dolatian M, Mirabzadeh A, Forouzan AS, Sajjadi H, Majd HA, Moafi F. Preterm delivery and psycho–social determinants of health based on World Health Organization model in Iran: a narrative review. Global Journal of Health Science. 2013;5(1):52-64.
[36] Hadley C, Mulder MB, Fitzherbert E. Seasonal food insecurity and perceived social support in rural Tanzania. Public Health Nutrition. 2007;10(06):544-51.
[37] Baheiraei A, Mirghafourvand M, Mohammadi E, Nedjat S, Charandabi SM-A, Rajabi F, et al. Health-promoting behaviors and social support of women of reproductive age, and strategies for advancing their health: Protocol for a mixed methods study. BMC Public Health. 2011;11(1):191-99.
[38] Jamshidimanesh M, Astaraki L, Behboodi Moghadam Z, Taghizadeh Z, Haghani H. Maternal-fetal attachment and its associated factors. Journal of Hayat. 2013;18(5):33-45.
[39] Martin KS, Rogers BL, Cook JT, Joseph HM. Social capital is associated with decreased risk of hunger. Social Science & Medicine. 2004;58(12):2645-54.
[40] Liverpool-Tasie LS, Kuku O, Ajibola A. Review of literature on agricultural productivity, social capital and food security in Nigeria. International Food Policy Research Institute (IFPRI), 2011;21:1-53.

PARTICULARS OF CONTRIBUTORS:
1. PhD Candidate of Reproductive Health, School of Nursing and Midwifery, Shahid Beheshti University, Tehran, Iran.
2. Assistant Professor, Department of Midwifery and Reproductive Health, School of Nursing and Midwifery, Tehran, Iran.
3. Assistant Professor, Non-communicable Diseases Research Center, Alborz University of Medical Sciences, Karaj, Iran.
4. Assistant Professor, Department of Nutrition Sciences, School of Nutrition Sciences and Food Technol, Tehran, Iran.
5. Professor, Department of Epidemiology, School of Public Health, Shahid Beheshti University of Medica, Tehran, Iran.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Mahrokh Dolatian,
Assistant Professor, Department of Midwifery and Reproductive Health, School of Nursing and Midwifery,
Shahid Beheshti University of Medical Sciences, Tehran, Iran.
E-mail: mhdolatian@gmail.com

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