International Journal of Engineering, Science and Mathematics
Vol. 8 Issue 3, March 2019,
ISSN: 2320-0294 Impact Factor: 6.765
Journal Homepage: http://www.ijmra.us, Email: editorijmie@gmail.com
Double-Blind Peer Reviewed Refereed Open Access International Journal - Included in the International Serial Directories Indexed & Listed at: Ulrich's Periodicals Directory ©, U.S.A., Open J-Gage as well as in Cabell's Directories of Publishing Opportunities, U.S.A

Breastfeeding and non-breastfeeding women with young children: food insecurity (FI), body mass index (BMI), socioeconomic position (SEP), and food consumption (FC).

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Abstract

A significant public health issue that may have a negative impact on people's health is food insecurity (FI). The current study's objective was to assess FI, BMI, food consumption (both quantity and quality) in lactating and non-lactating mothers with young children. There are 307 women (237 lactating and 70 non-lactating) participated in this cross-sectional study. By using questionnaires, socioeconomic and demographic data were acquired. It was used to assess the FI of families. Dietary diversity score (DDS), diet quality index-international (DQI-I), and nutrient adequacy ratio (NAR) calculations were made to evaluate the quality and quantity of food consumed by moms. Participants' weight, height, and body mass index (BMI) were assessed and computed. Finally, for statistical analysis, the Chi-squared test, analysis of variance (ANOVA), and linear regression were performed. Mothers in this study had obesity rates of 0.3%, 39.2%, 42.3%, and 18.2%, respectively, compared to normal weight rates of 0.3%, 39.2%, and overweight rates of 42.3% and 18.2%. Mother age had the least impact on BMI (Beta=0.101, P=0.013) while household food security status had the biggest impact (Beta=-1.584, P0.001). Mother's physiological state, educational level, access to facilities, housing size, and occupational status all significantly correlated with NAR. The mother's occupation, level of education, and access to amenities all had a big impact on DDS.

Additionally, it was discovered that the DQI-I significantly correlated with the mother's physiological health, facilities use, and level of education. The greatest significant impact on mothers' BMI was found to be related to their household's food security level. In this study, the obese group had the highest levels of nutrient adequacy and dietary diversity, whereas the normal weight group had the highest levels of dietary quality.

Keywords: Women, Food insecurities, Nutrients, Obesity and Demographic facilities.

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Introduction

A condition which is defined as having limited access to food and not being able to obtain adequate food by socially acceptable means, has grown to be a major public health issue worldwide. It is a complex issue with numerous components, including cultural, social, and psychological ones that may influence both the quality and length of life [1,2,3]. Food insecurity (FI) is associated with a lack of a diverse diet and a low nutritional intake [4, 5]. During the coronavirus pandemic (COVID-19), FI increased in the Asian region from 22.7 to 25.8% [6]. Several factors, including as age, family size, education level, and socioeconomic background, might have an impact on FI. Insufficient food is consumed by around 800 million people worldwide, which has an impact on their health [6]. A thorough review and meta-analysis revealed that 49% of Iranian families have FI. An suitable indicator of society's general health and the level of food security in households is the nutritional status of mothers and children [9]. Infant malnutrition can result from long-term insufficient calorie intake, which can affect the quantity and quality of breast milk [10]. A severe general health issue that contributed to 45% of child fatalities in 2011 was mother and child undernutrition [11]. As a result, the mother's diet must contain enough calories and nutrients [12]. To achieve adequate nutrition and promote growth, a varied diet is necessary [13]. The correlation between FI and anthropometric measurements (such weight and height) in mothers of young infants has not been extensively studied in Iran. The current study's premise was that there was a correlation between FI and BMI. Therefore, in this study, we evaluated the relationship between FI, BMI, and food intake in lactating and non-lactating mothers in Shahrekord, Iran, who have children under the age of two.

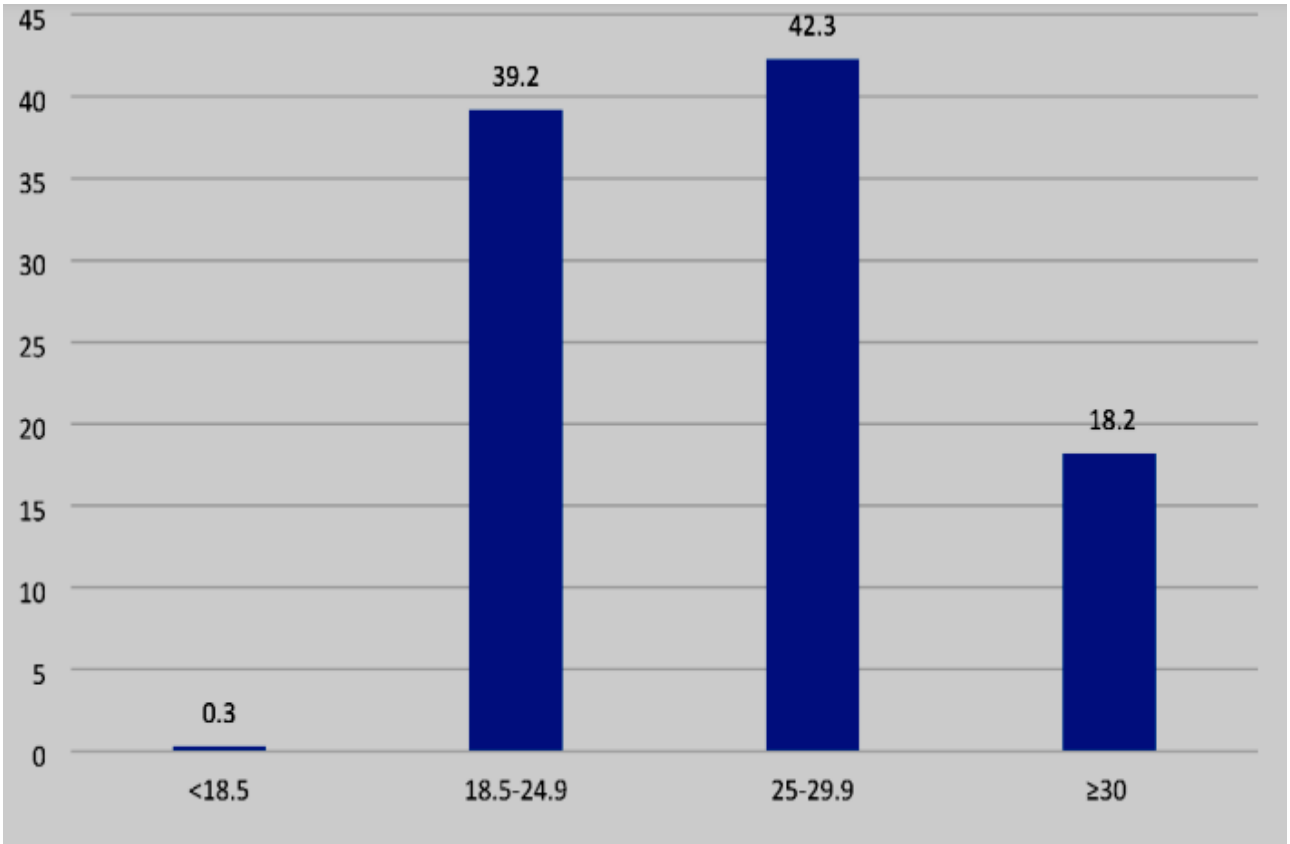
Methods:

The sample size was determined to be 307 people based on the previous similar work [14] and utilising NCSS (PASS) software with a first type error of 0.05 and a power of 0.8. In this cross-sectional study, 377 mothers—237 lactating and 70 non-lactating—were chosen from Shahrekord's medical facilities (the administrative hub of southwest Iran's Chaharmahal and Bakhtiari province). Mothers had a mean age of 31.4 and an average BMI of 26.5. From April to June 2021, participants were chosen using stratified random sampling . The inclusion criterion for this study was having a healthy child under the age of two who visited Shahrekord health centres, and the exclusion criterion was reporting a daily calorie intake of more than 4200 and less than 800 kcal. The participants completed a written consent form after being informed of the study's goal and methodology. All experiments were conducted in conformity with the necessary legislation and guidelines. Shiraz University of Medical Sciences' Ethics Committee gave its approval to the study's protocol.

Data collection:

Person-to-person interviews and questionnaires were used to gather data. Participants' socioeconomic and demographic characteristics, such as their family size, type of home ownership, number of family members who have jobs, level of education, and employment status (employed/unemployed), were collected. They were asked if any of nine things, including washing machine, television, house, washing machine, car (Taxi or no Taxi), computer, refrigerator, hand-woven carpet, and microwave, were present in order to gauge the household's economic situation. This survey received the following scores: Low: three or fewer things, moderate: four to six, and high: seven to nine items. Only nursing or not breastfeeding was used to measure and report the mother's physiological state. It was used to evaluate the FI status of families over the previous twelve months. It is divided into 18 questions in the following categories: Food security ranges from 0 to 2, from 3 to 7 to 12, and from 13 to 18, from mild to severe food insecurity. The approach described in the study by Kant et al. [18–20] was used to calculate the dietary diversity score (DDS). This approach split foods into five categories: grains, fruits, vegetables, dairy products, and meats. Rice, biscuits, corn flakes, refined flour, refined bread, macaroni, and whole grain bread were among the seven items in the grains category. Citrus fruits, berries, and other fruits were all included in the category of fruits. The vegetables group included green vegetables, yellow vegetables, beans, tomatoes, potatoes, and other starchy vegetables. The dairy group featured cheese, yoghurt, and milk, whereas the meats group contained poultry, eggs, fish, and red meat. The maximum score was 10, and each group's score ranged from 0 to 2. For the purpose of evaluating diet quality, the Diet Quality Index-International (DQI-I) was utilised. The diet's four key components are included in DQI-I. First, food variety (0–20 points) is divided into two categories: within the protein sources category (fish and shellfish, meat and products of meat, beans, eggs, milks and products of milk, grains, fruits, and vegetables), and between food categories. It evaluates the amounts of fibre, protein, calcium, vitamin C, iron, and cereals, fruits, and vegetables. The final category, moderation (0–30 points), contains items that are calorie-free and low in total fat, cholesterol, saturated fat, and sodium. The ratio of fatty acids and the ratio of macronutrients are included in the fourth balance (0–10 points), called the overall balance. The final DQI-I score ranged from 0 to 100, with 100 being the highest diet quality. A approach called the nutritional adequacy ratio (NAR) was used to assess nutrient sufficiency [22]. NAR was calculated for the nutrients calcium, iron, magnesium, phosphorus, which selenium, zinc, potassium, and sodium as well as the vitamins A, C, D, E, B1, B2, and B3. Body mass index (BMI) was determined after

participants' weight and height were measured using the usual WHO protocols (with an accuracy of 0.1 kg for weight and 0.1 cm for height) [23]. BMI classification was carried out as follows: A healthy weight range is between 18.5 and 24.9 kg/m2, between 25.0 and 29.9 kg/m2 is considered overweight, and 30 kg/m2 or above is considered obese [24]. Data analysis was done using the Windows version of SPSS (version 25.0). P-values under 0.05 were regarded as significant. ANOVA was used to look for quantitative factors, and the Chi-square test was employed to look for associations between qualitative variables. Additionally, linear regression was used to identify the key variables that significantly influenced participants' BMI, nutrient adequacy ratio, varied diet score, and food quality index.



Discussion and Results:

Mothers who were underweight, normal weight, overweight, or obese were more common than those who were each at 0.3%, 39.2%, 423%, and 18.2%, respectively (Fig. 1). For further in-depth study, the underweight group and normal weight group were combined to form one group (BMI25). Table 1 demonstrates that there was a significant difference in mother age between BMI category groups (P=0.020). The average age of the group of mothers who were obese was higher than that of

the mothers who were of normal weight. Between the three BMI categories, there was a substantially different level of household food security (P=0.001). The obese group showed the highest level of food security. Additionally, there were significant differences in NAR (P=0.003), DDS (P=0.001), and DQI-I (P0.001) between the BMI groups. The obese group had the highest levels of NAR and DDS, while the normal weight group had the highest levels of DQI-I and During this study, mothers were twice as likely to be overweight as children. The number of overweight women in the study by Mohammadi et al. [25] in Tehran, Iran, is nearly identical to that in the current study, but there is a difference in the number of obese women, which may be related to different lifestyles and a more sedentary way of life in large cities like Tehran. According to our research, the BMI was correlated with the mother's age, her occupation, the food security of her home, the NAR, and the DQI-I. Household food security status showed the most beneficial effect among these variables. One study in Lebanon indicated that there was a link between FI in families and poor nutritional quality and a diversity of moms, but no significant relationship between FI in households and maternal overweight status was discovered [26]. In contrast to the current study, a cross-sectional investigation in Mexico found a link between severe FI in homes and female obesity. According to one study conducted in Tehran on Iranian women, there was no correlation between DQI-I and waist circumference or BMI [28]. A study of Guatemalan adults, however, found a favourable connection between the DQI-I and waist circumference and BMI [29]. A further investigation conducted in Mexico found no association between diet quality scores and men's and women's BMI, as well as an inverse relationship between dietary scores and men's waist circumference [30]. One study of Chinese people with type 2 diabetes found a correlation between improved nutritional quality, such as greater dietary variety and less red meat consumption, and decreased probabilities of obesity. These variations may result from using different questionnaires, different sample sizes, and varying nutrition practises in other nations. Even within a nation, the relationship may vary between large and small cities. Mothers in food-insecure homes were shown to have a higher risk of obesity and inadequate diets, according to a study conducted among mothers in Lebanon [32]. Women in food-insecure homes are more likely to become obese as adults, according to a meta-analysis study, which also found that the risk of excessive weight can rise as FI levels rise.

Table.1 The linear regression method was used to evaluate the major factors affecting body mass index in moms of children under two years.

Predictors	Beta	P-value	95% CI for Beta
Mother age (year)	0.10	0.01	(0.02, 0.18)
Mother's occupational status	-0.68	0.03	(-1.30, -0.06)
Household food security status (USDA)	-1.58	<0.001	(-2.43, -0.72)
NAR	0.12	0.00	(0.03, 0.20)
DQI-I	-0.31	<0.001	(-0.41, -0.21)

The current study faces certain limitations, such as a limited sample size and the inability to establish a cause-and-effect link in cross-sectional investigations. This study's strength is its simultaneous evaluation of the effects of DDS, NAR, and DQI-I on mothers' BMI.

Conclusion:

According to the results of this study, more than half of the individuals had some form of obesity. The level of food security in the home had the biggest impact on mothers' BMI. Additional well-designed case-control or cohort studies are required to support the associations between food intake and Mothers' diet quality, weight status, and insecurities are examined in order to see how they would affect families in the future. The obese group had the highest levels of nutrient adequacy and dietary diversity, while the normal weight group had the highest levels of food quality. Therefore, it is imperative to organise interventions to increase mothers' BMI and level of food security.

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