

Nutritional status of Syrian female migrants in Turkey: a cross-sectional study

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ABSTRACT

It is known that individuals who are immigrants experience malnutrition due to various reasons. The present study was conducted to compare the nutritional status of immigrant women, who arrive in Turkey from Syria, before and after migration, and to determine the factors that affect their current healthy eating index scores. The individuals participating in the study were recruited from Immigrant Health Unit in Mardin-Turkey. The sampling of this cross-sectional study consisted of the women who were between the ages of 15-49, 450 Syrian migrant women participated in the study. The data were collected with face-to-face interview technique and with a questionnaire that consisted of 2 parts. According to the Healthy Eating Index (HEI)-2015 score of the individuals mean was found to be 52.90 ± 9.40 . According to the hierarchical regression model, the monthly income, life expectancy in Turkey, body mass index (BMI), and the number of individuals in the family were statistically significant components to predict the mean HEI score. It was determined that the basic eating habits of individuals changed in the country of immigration, and more foods with high carbohydrate and saturated fat contents were consumed. It is required to design comprehensive studies and policies.

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1. INTRODUCTION

Migration might happen voluntarily by individuals or groups, or it may happen outside their wills with the influence of various forces. Voluntary migration is referred to as depending on people's desires for better living conditions, various jobs, and social opportunities. Forced migration, on the other hand, occurs without the wishes of individuals or groups, and is called forced migration [1]. According to the 2020 World Migration Report of the International Organization for Migration (IOM), the number of people displaced on a global scale because of war and other forms of organized violence increased to 272 million and reached 3.5% of the world's total population [2], [3]. Nutrition is among the main problems of immigrants. Nutrition is defined as adequate-balanced consumption of nutrients in processes such as growth, development, and reproduction in humans. Insufficient or unbalanced use of these nutrients can cause many healthcare problems [4], [5]. However, it is accepted that nutrition is a sociological and psychological phenomenon as well as a physiological one [6]–[8]. It is already known that migration causes both positive and negative changes in human health. Migration might also play important roles in nutritional and health status because immigrants may be subject to different environmental influences and culture shock. When people migrate to a new country, they face difficulty in adapting to new dietary behaviors [9]. Exposure to different

environmental, cultural, and socioeconomic environments can promote differences in individuals' dietary patterns and metabolic profiles. These changes may be related to healthcare behaviors, including those associated with obesity. For example, a greater tendency was detected for type 2 diabetes and a higher cardiovascular risk was found in Japanese immigrants who have acquired Brazilian habits in Brazil [10].

When the nutritional habits of the immigrants are evaluated, it was found that they do not have sufficient and balanced diets, and they eat more fat and carbohydrates depending on their economic conditions. It was also found that the physical activity levels of immigrants decreased with migration, and their body mass indices were higher in women than in men [11]. The fact that immigrants have to have a carbohydrate-intensive diet not only for a healthy diet but also to fill their stomachs can cause them to have inadequate and unbalanced diets. As a result of this, several health problems such as anemia, malnutrition, diseases because of vitamin deficiencies, and growth retardation occur. In a study conducted with immigrant women in the 15-49 age group women most of stated that their primary problem was nutrition [12]. Turkey is a country with great immigration from Syria. Especially the city of Mardin, located on the Turkish-Syrian border, is a city where Syrian immigrants live. The population of this city 20% is Syrian immigrants. It is of great importance to meet the compulsory needs of Syrian immigrants living in this city, such as health, shelter and nutrition. This study was conducted to compare the nutritional status of migrant women migrating from Syria to Turkey after migration and to determine the factors affecting their current Healthy Eating Index (HEI) scores.

2. RESEARCH METHOD

All subjects gave their written informed consent before the start of the study. The study protocol was approved by the Ethical Committee of the Mardin Artuklu University non-invasive research ethics committee in accordance with the Helsinki declaration (Jan 15, 2019). The universe of the study consisted of all immigrant women in the 15-49 age group living in the city center of Mardin-Turkey. The sampling of the study consisted of women who were aged 15-49 admitting to the Immigrant Health Unit in Mardin city center for any reason between May, 2019 to February, 2020 and who accepted to participate in the study. A questionnaire form which was developed by the researchers with the support of the literature data consisting of second parts (demographic characteristics in the first part; and nutritional status and anthropometric measurements in the second part) was applied to the women who were included in the study. The data were collected by the researchers with face-to-face interview techniques. Informed consent was obtained from the women who were included in the study; and as a result, 450 people were reached. During the data collection phase, she worked with the researchers with two female translators whose mother tongue was Arabic and Kurdish as presented in Figure 1.

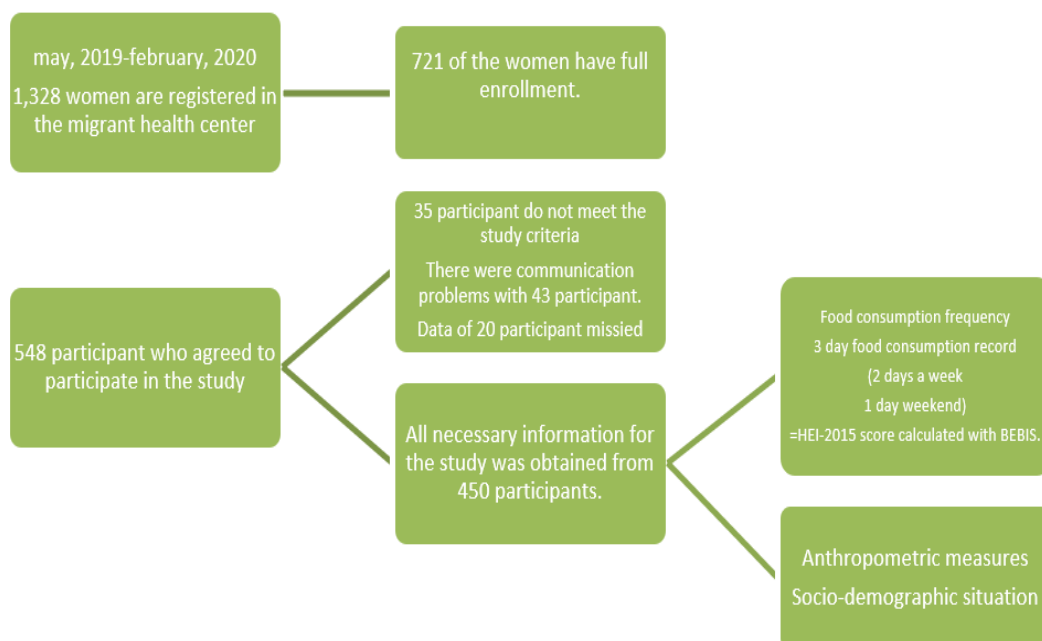


Figure 1. Study flow chart

2.1. Food consumption frequency questionnaire

The Food Consumption Frequency Questionnaire included questions on the consumption frequencies of 5 food groups and 41 foods, including milk and dairy products, meat-eggs-dry beans, vegetables and fruits, bread and cereals, fat-sugar-sweet-drinks. In this part, it was questioned which food, how much and how often individuals consumed in the past one month. The frequency of food consumption of the same foods in the last three months before migration in terms of food consumption frequency in Syria was also questioned.

2.2. Food consumption record

The consumption records of the participants for three days (two weekdays and one weekend) were questioned. The amount of each nutrient was calculated. The daily food consumption amount was found by dividing the total amount by the number of days. A standard recipe (calculation) was used to determine the amount of food consumed by the participants. The food consumption of the participants was recorded in the Nutrition Information System (BEBIS) 7 full version program, and their daily energy and nutrient intakes were recorded. Values such as carbohydrates, fat and protein were calculated.

2.3. Healthy eating index score-2015

Calculation of HEI Score Healthy Eating Index Score that included 13 dietary components to be consumed adequately and those that should be consumed limitedly. What should be consumed adequately (i.e. recommended to be included in a healthy diet); total fruits, whole fruits, total vegetables, dark green leafy vegetables - legumes, whole grains, dairy products, total protein foods, seafood-plant proteins, and fatty acids. What should be consumed in a limited amount (i.e. those that should be consumed in small amounts); refined (i.e. processed foods) grains, sodium, added sugar, and saturated fats. In this respect, ≤ 50 was defined as "poor diet quality", 51-80 was defined as "must be improved", and > 80 was defined as "good diet quality" according to the diet quality of the individuals, according to the total HEI score [13].

2.4. Statistical analysis

The SPSS 24 software version was used to evaluate the study data and make the necessary analyses. Numbers and percentages were used for categorical variables, and descriptive analyzes were made with the mean and standard deviation for continuous measurements. The Pearson Product Moments Correlation technique was used to examine the relations between the variables in line with the purpose of the research. Before the regression analysis was made to determine the predictive power of the HEI score. Then, continuous variables to predict the HEI score were added to the model in hierarchical regression analysis, respectively. Each added variable was kept constant and other variables (i.e. monthly income, life expectancy in Turkey, BMI, and the number of individuals living in the family) were added to the model, respectively; and a 4-variable model was created. It was determined that this model is the model that can predict the HEI score with the most variables.

3. RESULTS

The demographic characteristics of the individuals who participated in the study are given in Table 1. The mean age of the individuals was 35.26 ± 11.38 years, and the mean number of children was 2.36 ± 1.80 . It was observed that most of the individuals were married, and the number of individuals with secondary school level education was higher. It was determined that only 6.6% of the women who participated in the study worked, and the monthly income of 48.0% was between 1,000-2,000 liras.

The anthropometric measurements of the individuals who participated in the study are given in Table 2. The mean BMI value of the individuals was 23.6 ± 4.8 kg/m², and the number of individuals between $18.5 \leq \text{BMI} < 25$ was 86 (57.3%). The average waist-hip ratio of the individuals was 1.1 ± 0.2 . The waist-hip ratio (≥ 0.85) was 134 (89.4%) individuals who had higher than the average determined by the World Health Organization.

The frequency of food consumption before and after the migration from Syria is given in Figure 2. Individuals have higher meat consumption in Syria. It was determined that the daily consumption of dairy products was higher. It is seen that the distribution of food groups is more appropriate in the pre-migration period.

The distribution of individuals' Healthy Eating Index score criteria is given in Table 3. When the proficiency components were evaluated, the mean total fruit score of the individuals was 2.4 ± 1.6 , and the mean total vegetable score was 1.8 ± 1.7 . The mean whole grain score of individuals was 9.1 ± 2.9 . The milk group means a score of individuals was 3.5 ± 1.2 , that of the total protein foods was 3.0 ± 0.3 , and fatty acids mean score was 5.0 ± 3.9 .

Table 1. Demographic and characteristics of participants

| Demographic variables | N | % |
|---|-------------|------|
| Marital status | | |
| Single | 60 | 13.3 |
| Married | 354 | 78.7 |
| Divorced | 36 | 8 |
| Education status | | |
| Illiterate | 42 | 9.3 |
| Primary school graduate | 66 | 14.7 |
| Secondary school graduate | 171 | 38.0 |
| High school graduate | 150 | 33.3 |
| Graduated from a University | 21 | 4.7 |
| Working status | | |
| Not working | 420 | 93.4 |
| Officer | 9 | 2.0 |
| Worker | 21 | 4.6 |
| Age (mean±SD) | 35.26±11.38 | |
| The mean number of children (mean±SD) (In Turkey) | 2.36±1.80 | |
| The mean number of children (mean±SD) (In Syria) | 1.92±1.25 | |
| Monthly income (TL) | | |
| <1,000 | 165 | 36.6 |
| 1,000-2,000 | 216 | 48.0 |
| >2,000 | 69 | 15.4 |
| Total | 450 | 100 |

Table 2. Anthropometric measures of participants (n=450)

| Anthropometric measures | $\bar{x} \pm SD$ | Min | Max |
|----------------------------------|------------------|-------|-------|
| Weight (kg) | 60.8±12.1 | 44.0 | 118.0 |
| Height (cm) | 160.9±5.3 | 149.0 | 175.0 |
| Current BMI (kg/m ²) | 23.6±4.8 | 16.5 | 39.2 |
| BMI category | | | |
| BMI <18.5 (n%) | 33(7.3) | | |
| 18.5 ≤ BMI <25 (n%) | 258(57.3) | | |
| 25 ≤ BMI < 30 (n%) | 132(29.3) | | |
| ≥30 (n%) | 27(6) | | |
| Waist circumference (cm) | 77.0±14.3 | 63.0 | 115.0 |
| Hip circumference (cm) | 98.4±10.9 | 68.0 | 140.0 |
| Waist hip ratio (WHR) (cm) | 1.1±0.2 | 0.6 | 2.8 |
| WHR category | | | |
| Normal <0.85 | 48(10.6) | | |
| High ≥ 0.85 | 402(89.4) | | |

$\bar{x} \pm SD$; Mean ±standart deviation

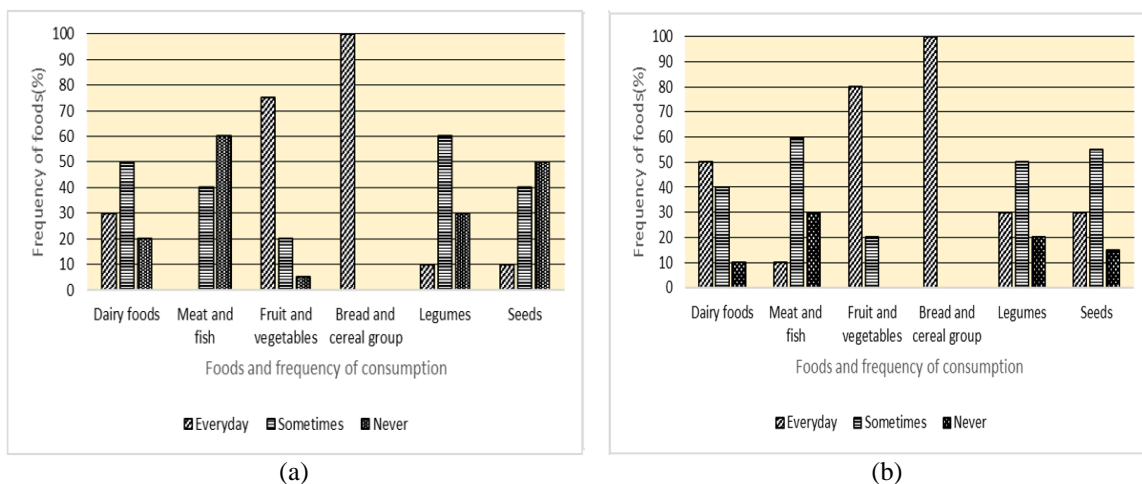


Figure 2. Frequency of food groups before and after immigration to last month (a) frequency of food consumption in Turkey and (b) frequency of food consumption in Syria (Before immigration)

Table 3. The participants of study total HEI-2015 point and components

| Components | Maximum points that can be obtained | $\bar{x} \pm SD$ |
|---|-------------------------------------|------------------|
| Adequacy | | |
| Total fruits (cup/1,000 kcal) | 5 | 2.4±1.6 |
| Whole fruits (cup/1,000 kcal) | 5 | 3.2±2.5 |
| Total vegetables (cup/1,000 kcal) | 5 | 1.8±1.7 |
| Greens and beans (cup/1,000 kcal) | 5 | 1.5±2.5 |
| Whole grains (oz/1,000 kcal) | 10 | 9.1±2.9 |
| Dairy | 10 | 3.5±1.2 |
| Total protein foods (oz/1,000 kcal) | 5 | 3.0±0.3 |
| Seafood and plant proteins (oz/1000 kcal) | 5 | 2.2±2.6 |
| Fatty acids ([polyunsaturated fatty acid (PUFA)+ monounsaturated fatty acid (MUFA)]/saturated fatty acid (SFA)) | 10 | 6.0±3.2 |
| Moderation | | |
| Refined grains (oz/1,000 kcal) | 10 | 2.8±3.3 |
| Sodium (g/1,000 kcal) | 10 | 4.5±4.0 |
| Added sugars (% of energy) | 10 | 9.1±2.2 |
| Saturated fats (% of energy) | 10 | 8.7±3.1 |
| Total HEI-2015 point | 100 | 52.90±9.40 |

When the HEI components that needed to be limited were evaluated, the mean of consumption scores of processed grains was 2.8 ± 3.3 , the mean of sodium consumption scores of individuals was 4.5 ± 4.0 , and the mean of added sugars was 9.1 ± 2.2 . The mean saturated fat score of the individuals was 8.7 ± 3.1 . Finally, the mean Healthy Eating Index score of the individuals was found as 52.90 ± 9.40 .

The hierarchical regression analysis was made to predict the HEI scores of individuals with monthly income, duration of life in Turkey, BMI, and the number of individuals in the family. The monthly income, duration of life in Turkey, BMI, and the number of individuals in the family were added to the model respectively as shown in Table 4. According to the results obtained with the monthly income added to the first model ($F=261.81$), the monthly income explained the variance of the HEI score at 29% ($R^2=0.294$). When life expectancy in Turkey was added to the model, the second model explained the HEI score at 81%, and the change in the coefficient of determination (R^2) was found to be significant ($F=315.427$, $p<0.001$). The third model, which was obtained by adding BMI, explained the variance of the HEI score at 87%, and the change in the coefficient of determination was significant ($F=377.919$, $p<0.001$). Finally, the fourth model, which was formed when the number of family members was added, explained the variance of the HEI score at 91%. When this value was added to the model, the change in the coefficient of determination was significant ($F=393.957$; $p<0.001$). All four variables affected and predicted the HEI score separately.

Table 4. Hierarchical regression model of the effect of individuals' monthly income, length of life in turkey, bmi and number of individuals in the family on healthy eating index score

| | Monthly income (TL) | Years living in Turkey (year) | BMI (kg/cm ²) | Number of family members | R^2 |
|----------------|---------------------|-------------------------------|---------------------------|--------------------------|-------|
| <i>Model 1</i> | <i>B</i> 0.041 | | | | 0.294 |
| | <i>SE</i> 0.005 | | | | |
| | β 0.543 | | | | |
| | <i>t</i> 7.862*** | | | | |
| <i>Model 2</i> | <i>B</i> 0.004 | 4.832 | | | 0.811 |
| | <i>SE</i> 0.003 | 0.241 | | | |
| | β 0.056 | 0.868 | | | |
| | <i>t</i> 1.299*** | 20.042*** | | | |
| <i>Model 3</i> | <i>B</i> -0.001 | 0.551 | -3.244 | | 0.886 |
| | <i>SE</i> 0.003 | 0.476 | 0.331 | | |
| | β -0.011 | 0.099 | -0.854 | | |
| | <i>t</i> -0.324*** | 1.158 | -9.790*** | | |
| <i>Model 4</i> | <i>B</i> 1.000 | 0.762 | -3.538 | 1.143 | 0.916 |
| | <i>SE</i> 0.002 | 0.411 | 0.289 | 0.160 | |
| | β 0.000 | 0.137 | -0.931 | 0.211 | |
| | <i>t</i> 0.007*** | 1.852*** | -12.256 | 7.164*** | |

*t****; Significance level 0.005, ANOVA. TL: Turkish lira

4. DISCUSSION

More than half of the 244 million migrants displaced due to wars and internal conflicts all around the world are women, and half of the 19 million refugees are women [14], [15]. As women are exposed to discrimination based on gender in society, they have a fragile structure. Gender discrimination is the cause of processes such as nutrition, access to healthcare services, and being economically victims [16]. Women participate less in the labor market, and therefore, they have to live dependently. Migrant women are not given a role in any case other than giving birth to children and taking care of them. All these social factors might result in malnutrition for women [1], [17].

The nutrition of women is more important than in other groups of society for giving birth to children, taking care of their nutrition, and ensuring the development of healthy eating habits, which is a necessary condition for family health. In studies that were conducted with immigrants, positive correlations were reported between anemia in the mother and in the child [12], [18], [19]. Maternal nutrition should be given importance as an important determinant of child health. In our study, mothers and children were not evaluated together; however, it was shown that women's nutritional problems were high.

The World Health Organization reported that the prevalence of overweight women was 40% worldwide [20]. In our study, nutritional deficiencies due to being a woman to the immigration disadvantage were examined; and 7.3% of women had a BMI below 18.9, i.e., underweight. It was also found that 35.3% of them were obese as a sign of an unhealthy diet (BMI over 24.9%). Similarly, it was reported that 38% of Iraqi immigrant women were overweight, and hypertension was an important problem with obesity [21]. As an indicator of nutritional deficiency, the prevalence of anemia in Syrian migrant women was 45% [22]. In this study that was conducted in a city in Turkey, it was determined that women had inadequate and unbalanced nutrition, which indicates that malnutrition, obesity, and malnutrition are common in women. People who migrate often struggle to settle in their new country. The housing and nutrition issues are at the top of this list. Particularly people from the Middle East countries experience nutritional deficiencies when they migrate to more developed nations. consists of nutritionally-based habits. However, there are economic issues and different customs in the destination nation [23]–[25].

The access of Immigrants to health services is guaranteed by international laws. However, because of many factors such as insufficient healthcare literacy, inadequate health service infrastructure in countries, and the value given to women, especially women's access to health services remains inadequate. There are significant problems in the access of immigrants to healthcare services. Because of the language barrier, they cannot understand health education about healthy nutrition and are not aware of healthy eating habits. Inadequate healthcare literacy prevents progress in solving nutritional problems [18], [26].

Forced migrations primarily affect the health of individuals. Nutrition is one of the first factors affected during migration, as it is directly related to the income status of people. The vast majority of Syrian immigrants have less income in the country of origin. Low income means malnutrition. Among the causes of malnutrition of individuals, the biggest reason is the lack of food diversity [27]. According to the results of the study, it was observed that the income status of individuals decreased after emigrating from Syria to Turkey. Therefore, it is seen that food diversity is not provided.

How long immigrants were immigrants also affects their nutritional status. It was reported that the longer the migration period, the higher the risk of obesity and hypercholesterolemia increased. In our study, a correlation was detected between the length of stay in Turkey, HEI scores, and BMI. The reasons for this are that immigrants become poorer as time proceeds, and cannot eat healthily, cannot access health literacy resources, and physical inactivity is common. It was reported in a study that immigrant women had higher BMI [28]. Also, studies are showing that immigrant women have lower BMI [29], [30]. Insufficient physical activity in the settlement where the migration ends and relatively cheap, unhealthy diets based on carbohydrates that increase body weight cause weight loss before and during migration, and BMI increases. In our study, the increase in BMI as the immigration period lengthens supports this finding. Immigrant women had a higher habit of consuming cheaper and higher carbohydrate foods [31]. Because this type of food is relatively cheaper and access is easier. Also, a carbohydrate-heavy diet is in line with traditional eating habits. The high consumption of bread, rice, bulgur, and pasta among Syrian women was because of the difficulty in accessing protein source nutrients in our study. Immigrants do not have access to foods as sources of protein, iron, vitamin B₁₂ playing important roles in preventing diseases. Poverty is the most important reason for this. Especially, it is necessary to provide better nutrition for migrant women with limited income sources [32]. In this study, the frequency of food consumption was examined. It has been observed that individuals prefer foods with high carbohydrate content. Foods with high carbohydrate content are seen as the cause of many public health.

Nutrition is not only filling the stomach so adequate and balanced nutrition is possible by consuming all food groups in a way to meets the body's needs. Migration affects women's basic life needs such as nutrition and physical activity levels. In a study in which the healthy lifestyle behaviors of female

immigrants and the factors affecting them were evaluated, it was determined that women's health responsibility, physical activity, and nutrition behaviors were at a moderate level [33], [34]. Our study findings, however, showed that Syrian migrant women do not have adequate and balanced nutrition. Inadequate and balanced nutrition causes underweight or, on the contrary, obesity. Our findings are compatible with the literature with these results.

However, there are imitations of the study. When the study started, the nutritional conditions of the individuals in the countries they came from were not the same as in Turkey. The fact that the war started in the country they came from had a negative impact on nutrition. There is no war environment in Turkey, but economic problems have seriously affected nutrition. Another limitation is that the study could not be conducted in different cities. The study was conducted in a single center.

5. CONCLUSION

In the present study, the nutritional status of migrant women before and after the migration was compared. It was determined that the basic eating habits of the individuals participating in the study have changed in the country of immigration and that their basic dietary habits are more carbohydrates and foods with high saturated fat content. According to the results of this study, it is necessary to develop comprehensive studies and policies to improve the nutritional status of migrant women. Inadequate and unbalanced nutrition may cause many healthcare problems.

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