Short Communication

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Sources of Information and Nutritional Status of Women in the First Trimester of Pregnancy in Tehran

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ABSTRACT

BACKGROUND AND OBJECTIVE: Healthy, adequate, balanced and varied nutrition during pregnancy is essential for the health of mother and baby. Considering the need for proper nutrition for fetal growth and supply of mineral reserves and the role of nutrition in preventing pregnancy complications in mother and baby and the importance of sources of nutrition information, the aim of this study was to investigate the nutritional status of women in the first trimester of pregnancy and the role of information sources on it in Tehran.

METHODS: In this cross-sectional study, 330 primiparous pregnant women referred to Najmieh and Shahid Mostafa Khomeini hospitals in Tehran in 10-12 weeks of gestation were selected by convenience sampling and their nutritional status was assessed using a 147 item food frequency questionnaire. Demographic characteristics questions and sources of nutrition information during pregnancy were asked by a trained midwife.

FINDINGS: The mean age of the subjects was 26.02±3.70 years. Sources of nutrition information during pregnancy were 29.7% from the Internet and mobile phones, 20.3% from books, 14.2%, mothers, 11.5% radio and television, 9.1% health care staff and 7.6% from other sources and 7.3% of women had no source of information. Mean consumption unit of food groups and subgroups/day during the first trimester of pregnancy for bread and cereals was 7.3±3.12, for meat and eggs was 1.07±0.65, fruit 3.56±2.05, vegetables 2.17±1.15, dairy products 2.18±1.86, protein 2.42±1.23, nuts 1.00±0.79, fat 7.01±3.75, sugar 5.21±3.45, processed meats were 0.04±0.09 and bean was 0.34±0.30 units. The most important sources of nutritional information during pregnancy were Internet and mobile phone and books and a significant relationship was found between the use of Internet, books and mobile phone and the mean consumption of dairy products, vegetables, fruits and grains ($p<0.05$).

CONCLUSION: The results of the study showed that the highest consumption of food groups belongs to the bread and cereals group and the lowest to the dairy group. Furthermore, the best sources of information were the Internet, mobile phones and books.

KEY WORDS: *Pregnant Women, Nutritional Status, Sources of Nutrition Information.*

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Introduction

The relationship between food and the health of people in the community has been confirmed and emphasized (1). Maternal health status during pregnancy plays an important role in quality of life, fetal health and future generations (2). Healthy, adequate, balanced and varied nutrition during pregnancy is essential for the health of mother and baby (3, 4) and contributes to the supply of mineral reserves to the mother and successful breastfeeding. Improper nutrition during pregnancy, in addition to affecting the weight of the baby at birth (4), increases risks such as miscarriage, premature birth and low birth weight (5-7) and leads to complications such as obesity, gestational diabetes and preeclampsia (8-11).

Inadequate nutrition, especially in early pregnancy, is likely to affect fetal brain development, leading to tissue damage or mental retardation in infants (12, 13) and inevitable consequences such as diabetes, hypertension, and vascular cardiomyopathy in middle age (14-16). According to the nutritional guidelines during pregnancy and lactation, pregnant women need to receive a variety of major food groups in order to receive extra calories and proper nutrition (17). But some pregnant women, despite gaining weight, do not have a good eating pattern and do not use the main food groups properly. This leads to insufficient intake of vitamins and micronutrients (15, 18, 19).

Improving the knowledge of pregnant women about nutrition is of particular importance. On the other hand, the growing use of mobile phones and the Internet in recent years and its integration with human life in the exchange of information (20) acts as an important educational resource in improving nutrition during pregnancy. Determining the role of sources of nutrition information during pregnancy is important in policy-making, planning and creating an appropriate environment in pregnancy. Since limited studies have examined the nutritional status of women in the first trimester of pregnancy and sources of information in that field, this study was conducted to determine the relationship between sources of information and nutrition of women in the first trimester of pregnancy in Tehran.

Methods

This cross-sectional study was approved by the ethics committee of Tarbiat Modares University with the ethics code IR.TMU.REC.1394.40, and was conducted on 330 primiparous pregnant women referring to Najmieh and Shahid Mostafa Khomeini hospitals in Tehran in 10-12 weeks of pregnancy while obtaining written consent from them. The study was conducted from January 2016 to May 2017. Individuals with live and singleton fetuses and knowing their weight since two months before pregnancy were included in the study and were excluded from the study in case of physical-mental illness, having a special diet and vegetarianism. Data were collected using a 147-item food frequency questionnaire whose validity and reliability were determined by Mirmiran et al. (21) and questions on demographic characteristics and sources of nutrition information during pregnancy were interviewed by a trained midwife.

Responses were received as reports of consumption/day (such as bread) or week (such as meat) or month (such as fish). For each unit of food items, the units of consumption specified in the Manual (22), such as a piece of bread, a medium apple, a glass of milk, or household items such as six tablespoons of baked beans, a chicken thigh and a medium plate were used as a unit of consumption. Daily intake of food items was calculated by multiplying the consumption frequency by the size of each food item and the weekly or monthly items were converted into units of consumption/day (23).

Ten food groups were obtained using other studies (3, 23) and adapting to our dietary patterns (Table 1). Nutritional adequacy according to the nutritional guidelines during pregnancy and lactation (24) were considered in three groups of less, equivalent and more than the recommended amount/day. This amount in bread and cereals group was recommended 7-11, fruits 3-4, vegetables 4-5, milk and dairy products 3-4, protein group 3 units and minimum consumption was suggested in miscellaneous group (fats and sugars). Regarding the sources of information, the subjects chose one of the most important sources used.

Body Mass Index (BMI) was calculated by measuring height and weight before pregnancy (self-report) and was classified according to the criteria of the American Medical Institute (25). Low, medium and good family income were collected based on self-report, grouping and information using a questionnaire. The sample size was calculated 275 using the mean and standard deviation derived from the results of the preliminary study, with an error of 5% and a confidence level of 95%, and 330 people entered the study through convenience sampling. Data were analyzed using SPSS 21 software and descriptive, chi-square and independent t-tests. $p<0.05$ was considered significant.

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Table 1. Items used in food group analysis

Food groups	Food items
Bread and cereals	Breads, rice, pasta, noodles, potatoes, corn, cobs, barley and oats
Meat and eggs	Red and white meats, guts and viscera, eggs
Nuts	Almonds, walnuts, pistachios, hazelnuts and seeds
Grains	Lentils, beans, peas, beans, soybeans, mung beans and chickpeas
Fat	French fries, cream cheese, cream and butter, olives, sauces, vegetable and animal oils, sweet, puffs and chips
Fruits	All kinds of juices and fresh fruits
Vegetables	Lettuce, cabbage, tomatoes, cucumbers, cooked and raw vegetables, squash, eggplant, celery, green peas, green beans, carrots, onions, bell peppers, mushrooms and turnips
Dairy	Types of milk, types of yogurt, cheese, curd and buttermilk
Sugar	Biscuits, crackers, cakes, ice cream, industrial juices, compotes, nuts, sugar, sugar, cottage cheese, honey, jams, cookies, sweets, Gaz, Sohan, chocolate, candy and candy
Processed meats	Canned fish, hamburgers, sausages

Results

330 pregnant women with mean age, pre-pregnancy weight and BMI of 26.02±3.70 years, 62.70±11.03 kg and 23.94±3.99, respectively, participated in this study. Mean consumption unit of food groups and subgroups/day during the first trimester of pregnancy for bread and cereals was 7.3±3.12, for meat and eggs was 1.07±0.65, fruit 3.56±2.05, vegetables 2.17±1.15, dairy products 2.18±1.86, protein 2.42±1.23, nuts 1.00±0.79, fat 7.01±3.75, sugar 5.21±3.45, processed meats were 0.04±0.09 and bean was 0.34±0.30 units. Consumption of bread and cereals group in 163 people (49.4%), protein group in 229 people (69.4%), fruits in 166 people (50.3%), vegetables in 253 people (76.7%) and dairy products in 266 patients (80.6%) in the first trimester of pregnancy were less than recommended by nutritional guidelines during pregnancy and lactation (17). In the food pyramid, the mean consumption/day of food groups from base to top were bread and cereals, fats, sugars, fruits, proteins, vegetables and dairy groups, respectively (Figure 1). Sources of nutrition information during pregnancy were 29.7% from the Internet and mobile phones, 20.3% from books, 14.2% mothers, 11.5% radio and television, 9.1% health care staff and 7.6% from other sources and 7.3% of women had no source of information. Regarding income level, 80 people (24.2%) reported low income, 188 people (50.7%) reported medium income, and 62 people (18.8%) reported high income. There was a significant relationship between information obtained from the Internet and mobile phones and the mean consumption of dairy, fruit, vegetable and grain food groups. The mean consumption of dairy products, fruits, grains and vegetables in Internet and mobile phone users was significantly higher than those who did not use this resource ($p<0.05$). Moreover, there was a significant relationship between the mean consumption of dairy, vegetable and grain food groups using the source of books, radio and television and the mean consumption of nuts and fruits and receiving information from other sources and the mean consumption of vegetables ($p<0.05$). However, the resources of health care personnel and mothers did not show a significant relationship with the mean consumption of food groups ($p<0.05$) (Table 2). There was no significant relationship between Internet use and mobile phone for gaining pregnancy nutrition information with age and occupation ($p<0.05$). However, a significant relationship was observed with education and family income ($p<0.05$) (Table 3).

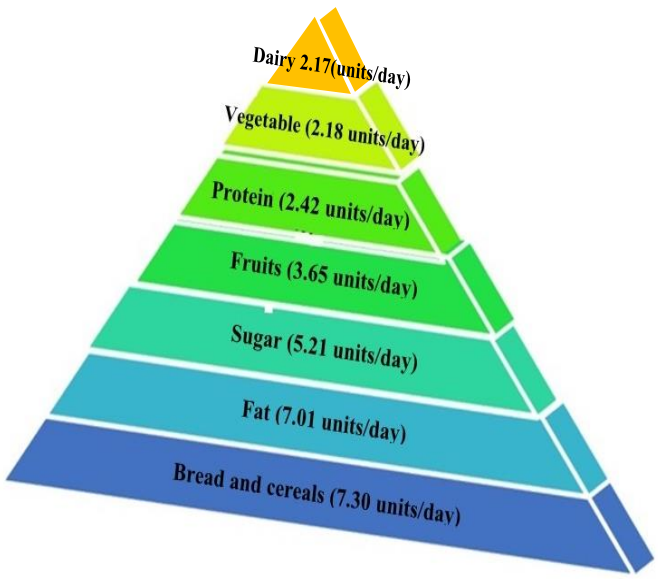

Figure 1. Pyramid of food groups in the studied population

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Table 2. Comparison of nutrition information sources during pregnancy and the mean consumption/day of food groups in the study population (n=330)

Sources of information	Bread and cereals	Grains	Meat and eggs	Nuts	Processed meat	Fruits	Vegetables	Dairy	Fat	Sugar
Internet and mobile phone										
Yes	7.48	0.41	1.13	0.97	0.05	4.16	2.40	2.68	7.13	5.10
No	7.04	0.30	1.03	0.99	0.03	3.16	2.05	1.88	6.80	5.13
p-value*	0.231	0.004	0.204	0.820	0.153	0.000	0.004	0.000	0.636	0.940
Book										
Yes	7.17	0.36	1.08	0.95	0.04	3.64	2.28	2.31	7.02	5.02
No	7.24	0.24	1.01	1.10	0.04	2.90	1.75	1.53	6.48	5.22
p-value*	0.860	0.006	0.424	0.147	0.907	0.008	0.001	0.002	0.308	0.793
Mother										
Yes	7.19	0.39	1.01	1.00	0.02	3.26	2.01	1.64	6.96	5.39
No	7.18	0.32	1.07	0.98	0.04	3.52	2.19	2.23	6.82	5.07
p-value*	0.979	0.150	0.551	0.831	0.249	0.412	0.328	0.043	0.908	0.556
Radio and TV										
Yes	7.14	0.28	1.12	0.66	0.35	2.70	1.82	2.23	6.75	4.34
No	7.19	0.34	1.05	1.03	0.43	3.59	2.21	2.13	6.93	5.23
p-value*	0.918	0.212	0.538	0.006	0.724	0.010	0.057	0.756	0.783	0.139
Health personnel										
Yes	6.77	0.31	1.00	1.06	0.04	3.42	2.47	2.41	7.31	5.72
No	7.23	0.34	1.07	0.98	0.04	3.49	2.13	2.12	6.86	5.06
p-value*	0.418	0.637	0.557	0.583	0.700	0.859	0.135	0.405	0.538	0.323
Other sources										
Yes	6.62	0.29	1.00	1.08	0.03	4.00	2.77	2.14	6.78	5.89
No	7.25	0.34	1.07	0.97	0.04	3.43	2.11	2.14	6.92	5.14
p-value*	0.180	0.444	0.631	0.524	0.567	0.176	0.007	0.999	0.862	0.631

Table 3. Frequency of Internet and mobile phone as a source of nutritional information during pregnancy compared with demographic characteristics of the study population (n=330)

Demographic features	Internet and mobile phone Yes	Internet and mobile phone No	p-value
Age			
≤20	6(37.5)	10(62.5)	0.783
21-30	97(29.4)	185(70.6)	
≥30	16(30.8)	36(69.2)	
Education			
Diploma and associate's degree	49(40.2)	73(59.8)	0.004
Bachelor degree	20(22.5)	69(77.5)	
Master's degree and higher	10(33.3)	20(66.7)	
Family income			
Low	14(17.5)	66(82.5)	0.019
Average	63(33.5)	125(66.5)	
Good	22(34.4)	40(65.6)	
Occupation			
Housewife	77(31.8)	165(68.2)	0.114
Employee	22(25)	66(75)	

Discussion

In the present study, the mean consumption of four main food groups including bread and cereals, protein, vegetables and milk and dairy products in most women in the first trimester of pregnancy was lower than the recommended level, which was consistent with the findings of other studies (26-30). These results may be related to the first trimester of pregnancy. However, the mean consumption of fruits was higher than

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recommended, which was similar to other studies (26, 27). The availability of this food group and the lack of need for cooking and preparation may be the reasons for the tendency of pregnant mothers to consume it (31). In this study, the most important sources of information about nutrition during pregnancy were the Internet and mobile phones, followed by books. However, the mean consumption of bread and cereals was not significantly related to mothers' information sources and this indicates less attention to the group of bread and cereals and fear of obesity probably leads to less tendency to consume high-calorie foods, so educating mothers to increase their awareness of malnutrition is necessary (30).

In this study, the mean consumption of grains and dairy products showed a significant relationship with obtaining information through the Internet and telephone, along with books, and the consumption of grains and dairy products has increased among their users. Dairy consumption was generally lower than recommended, which could be related to morning sickness, which is one of the reasons for the decrease in consumption in this group in the first trimester of pregnancy (29).

There was a significant relationship between the mean consumption of vegetables and fruits with the source of information through books and the Internet and mobile phone. Pollard et al. also reported that Internet users are increasing every year in obtaining nutritional information and healthier food choices (32) and confirm the results of the present study. Mousavi et al. cited the most important source of information during pregnancy to be obstetricians and mentioned the Internet and mobile phones as other important sources of information about fetal health (33). The reason for the difference in the most important sources of information with this study can be the difference in gestational age at the time of data collection. Because in our study, data collection was in the first trimester of pregnancy, but in their study, gestational age was not considered. Therefore, the number of visits in the first trimester and the opportunity for nutrition training were probably lower. Therefore, considering the importance of nutrition from the beginning of pregnancy, it is necessary to start education from the first trimester of pregnancy.

In this study, approximately 30% of mothers were in the overweight or obese group, which was consistent with the studies of others (27, 31, 34). This emphasizes on the importance of nutrition education in preventing high BMI complications in pregnancy. In this study, a significant relationship was found between obtaining information from the Internet and mobile phone with education and family income, which was similar to the study of Bigdeli et al. (35); it had no significant relationship with mother's age and occupation, and it was different from Bigdeli et al.'s study in this regard. Probably the reason for this difference is the type of society studied (35).

In general, the Internet and mobile phones and books were the most important sources of information in improving the mean consumption of food groups. Therefore, providing books and information through the Internet and mobile phones along with planning can be effective in improving the nutrition of pregnant mothers.

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