

## A Survey on the Dietary Habits of Rural Women in Fars Province, Iran

Negar Darvish<sup>1</sup>; Negin Hadi<sup>2,\*</sup>

<sup>1</sup>Community Medicine Department, Shiraz University of Medical Sciences, Shiraz, IR Iran

<sup>2</sup>Community Medicine Department, Neurosciences Research Center, Shiraz University of Medical Sciences, Shiraz, IR Iran

\*Corresponding author: Negin Hadi, Community Medicine Department, Neurosciences Research Center, Shiraz University of Medical Sciences, Shiraz, IR Iran. Tel.: +98-9173170837, Fax: +98-7112354431, E-mail: hadin@sums.ac.ir

Received: October 9, 2013; Revised: November 23, 2013; Accepted: January 13, 2014

**Background:** The relationship between nutritional pattern and non-communicable diseases such as coronary artery diseases, diabetes, and obesity has already been established.

**Objectives:** The aim of this study was to determine the relationship between nutritional pattern and education level of rural women in Iran.

**Materials and Methods:** The present research was conducted on 209 randomly selected women who consented to take part in the study, and lived in kaftarak area of Shiraz during the past year. A questionnaire used in the study was prepared in collaboration with all residents of the department Community Medicine of Shiraz University of Medical Sciences. Chi-square and t-tests were used for statistical analysis.

**Results:** Among participants, 45% were in the low educated group and 55% were literate. According to our findings, the participants used five major groups of food in appropriate amounts. Of these, 49% consumed fruits, 54.3%, vegetables, 69.5% protein, 57.6%, dairy products, and 5.7% bread and cereals. Our study showed a significant relationship between education level of the participants and the appropriate consumption of fruits, vegetables, protein and dairy products. However, there was no significant association between education level and consumption of fat and carbohydrates. The participants became overweight or obese when deriving most of their calories from carbohydrates. The mean BMI of the subjects was  $26.68 \pm 5.8$  which was consistent with their inappropriate use of fats and carbohydrates.

**Conclusions:** The women in rural areas became prone to overweight and obesity by inappropriate consumption of some foods.

**Keywords:** Nutritional habits; Food consumption; Rural; Women; Iran

### 1. Background

Health is the basic human right, and the women's health alongside dramatic improvements of female's literacy levels have been the focus of attention over the last two decades. According to the last census, in Iran, women comprise 49.5% of the total population. They play a central role in family health and society, and undertake different family tasks such as child bearing, child care, cooking and shaping family lifestyle, as well as deciding about financial aspects of the household. By and large, women play an important role in family health, and often make decision regarding household diet, an issue central to the family health (1).

Furthermore, a relationship has been observed between nutritional pattern and non-communicable diseases such as coronary artery diseases, hypertension, dyslipidemia, diabetes, and obesity (2, 3). Appropriate use of the five main food groups including bread and cereals, vegetables, fruits, meat and dairy products promotes healthy weight. The recommended daily servings of these diets include 3 to 5 vegetables, 6 to 11 bread and cereals, 2 to 4 fruits, 2 to 3 protein, and 2 to 3 dairy products (4).

Ijarotimi et al., showed that only a quarter of participants in Nigeria in 2010 used appropriate amount of vegetables and others either used less or none (5). In a study conducted by Lallukka et al. It Showed that participants used less than two daily servings of fruit and vegetables and men, with higher education consumed more fruits and vegetables than women (6). The study of lee et al., in Korea demonstrated that people with higher education and greater income were more likely to consume meat, rice and vegetables compared to those with lesser income and lower education level (7).

Nemati et al., showed that the rural population foods included more bread, potatoe, eggs, milk, oil, butter and tomatoe and the calorie intake in 20% of the rural population was less than 75% recommended by the World Health Organization (8). Study conducted by Samar et al., revealed that the mean consumption of cereals and dairy by rural women was more than urban females and the average fruits consumption by rural women differed significantly from urban counterparts. However, no significant difference in using fats, vegetables and cereals was

#### Implication for health policy/practice/research/medical education:

Due to the relationship between education level and the proper use of food, it seems that it is necessary for health policy makers to pay more attention to increasing health literacy of individuals.

Copyright © 2014, Health Policy Research Center, Shiraz University of Medical Sciences. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

observed between rural and urban women (9). The study of Mirmiran et al., in Tehran on lipid glucose showed that most adult favored change in diet, and showed that most participants consumed inadequate meat, fruits, vegetables and whole grains (10).

Overweight and obesity are risk factors for non-communicable diseases, and can be addressed by having appropriate diet (11). For this reason it is imperative to plan strategies that improve the nutritional status of families. Since no study on nutritional status of rural women has been reported in this region, the present investigation was designed to evaluate nutritional status and dietary habits of families in rural areas of Fars province and its relationship to educational level of the population.

## 2. Objectives

The aim of this study was to determine the relationship between nutritional pattern and education level of rural women in Fars Province, Iran.

## 3. Materials and Methods

This cross sectional study was carried out in Kaftarak Population Research laboratory that is under supervision of the department of community medicine of Shiraz University of medical sciences. Kaftarak, is a village located nine kilometers South-East of Shiraz, and along the Maharlu Lake, with 2,000 inhabitants and 600 families. A total of 209 women, each representative of one family and aged older than 18 years were selected from this population by random sampling method. The participants lived in Kaftarak over the past year, and those unwilling to cooperate were excluded from the study. Statistical analysis considered 5% accuracy in the population and 30% risk prevalence. Each family was represented by a number in the health center, and the numbers were selected by telephone calls. Anyone who did not desire to cooperate with this project was excluded and replaced by the next woman. A questionnaire used to evaluate the nutritional status of the participants, was developed under the supervision of an academic and in collaboration with all residents of the department of community medicine. The validity of the questionnaire was attested by other faculty members, with the 0.7 reliability according to Cronbach alpha formulae. The questionnaire included two parts as follows:

A) Demographic information included age, marital status, education level, weight, height, waist circumference. Educational level of the participants comprised two groups of low education and the literate. Those who studied less than eight years were placed in low education group and the subjects with more than eight years of study were considered as literate group.

B) Five main groups of food were bread and cereals, vegetables, fruits, meat and dairy products. The appropriate daily servings of aforementioned groups of foods were

explained to the participants, and included 3 to 5 vegetables 2 to 4 fruits, 6 to 11 breads and cereals, 2 to 3 protein and 2 to 3 dairy products. In this context, different servings were defined as cereals 30 grams or half a glass, cooked rice and pasta half a glass, fruits including an average size fruit such as apples, oranges a watermelon slice, quarter of cantaloupe, three-quarters cup of fruit juice, half a glass of small fruits like berries, grapes and pomegranates. Other servings contained 60-90 grams lamb's meat, 200-150 g fish and poultry, equivalent to half a glass cooked beans. Each serving of dairy product was defined as a glass of milk or half a glass of yogurt or 45 g of cheese equivalent to a box of matches (4). Also, the daily consumption of sweets was asked.

Every Monday, two residents visited 5-10 women at Kaftarak health center and completed the questionnaires as reported by the participants, with each questionnaire taking thirty minutes to fill out. During the course of study the number of women declined. This problem was solved by selecting next subject by phone call.

Descriptive statistics are shown in figure and table and analytic statistics were calculated using t test, chi-square and fisher exact tests. P Values equal to or less than 0.05 were considered significant, and SPSS standard program (version 15) was used for data analysis.

## 4. Results

This survey attempted to explore the demographic patterns and nutritional status of randomly selected 209 women who lived in Kaftarak over the past year. The participants aged from 18 to 77 years with mean age  $34.30 \pm 12.7$  years. Their waist circumference and mean body mass index (BMI) were  $92.64 \pm 14$  and  $26.68 \pm 5.8$  respectively (Table 1).

A significant difference in mean BMI and waist circumference was found between the low-literate and literate classes (Table 2).

The completion of questionnaire regarding the consumption of 5 groups of main foods by women was based on self-reporting. Only 49% of the participants used appropriate amount of fruits and the remaining 40.5% consumed one serving of fruits which was insufficient.

Of participants, 54.3% had adequate consumption of vegetables and 40.5% used less than three servings. The consumption of less than one serving of protein including eggs, beans and meat was reported by 28.6% of the subjects.

Only 5.7% of women consumed appropriate amounts of bread and cereals and 94.3% of people used more than 11 servings. Dairy products, 2 to 3 servings per day, were consumed by 57.6% of the subjects. Food consumption patterns of five major categories of foods are listed in Table 3. There was significant relationship between education level of the participants and the consumption of fruits ( $P = 0.003$ ), vegetables ( $P = 0.021$ ), protein ( $P = 0.013$ ) and dairy intake ( $P = 0.01$ ). There was significant consump-

tion of appropriate amount of fruits, vegetables and dairy products by women with higher level of education. However, no significant relationship was found between the level of education and the consumption of bread and cereals ( $P = 0.098$ ), as well as between level of education and the consumption of fat ( $P = 0.672$ ) and sweets ( $P = 0.881$ ). P values of different groups of food are presented in Table 4.

## 5. Discussion

The main impetus for conducting the present investigation was the incontestable role played by women in shaping the family life. Therefore, this study attempted to evaluate the different facets in lifestyles of rural women in southern Iran. Our findings showed that the daily consumption of 94% of rural families was more than 11 servings of carbohydrates. This was due to the low cost and availability of carbohydrates. Most people in Kaftarak village are of low economic status and consume low cost foods, thus become overweight or obese because of high calorie content of carbohydrates, the assimilation of which converts them into fat. As a result rural women become susceptible to non-communicable diseases such

as coronary artery diseases, hypertension, dyslipidemia and diabetes. Nemati et al., study evaluated 250 families in 15 villages and showed that most of rural households consumed bread and potato as their main foods (8).

**Table 1.** The Demographic Characteristics of Participants

Age Group, year	No. (%)
18 - 30	109 (52.4)
31 - 60	86 (41)
61 -77	14 (6.6)
<b>Total</b>	209 (100)
<b>Education</b>	
Low education	94 (45)
Literate	115 (55)
<b>Total</b>	209 (100)
<b>Marital Status</b>	
Single	4 (1.9)
Married	188 (89.9)
Divorced/widowed	17 (8.2)
<b>Total</b>	209 (100)

**Table 2.** Mean BMI and Waist Circumference of Participants

Educational status	Mean Body Mass Index	P Value, (95% CI)	Mean Waist Circumference	P Value, (95% CI)
Low education	28.64 ± 7.2	0.004, (0.926_4.802)	97.29 ± 14.1	0.001, (4.55_12.59)
Literate	25.78 ± 6.9		88.72 ± 14.5	

**Table 3.** Consumption Patterns of Five Major Categories of Foods

Serving Per Day	Not used, (%)	Appropriate, (%)	Inappropriate, (%)
Fruits groups	10.5	49	40.5
Bread and cereals group	-	5.7	94.3
Vegetables	5.2	54.3	40.5
Dairy group	5.7	57.6	36.7
Protein groups	1.9	69.5	28.6

**Table 4.** The Relationship between Literacy level and Consumption of Major Food Groups

Food Groups	Educated Participants, No. (%)	Non Educated Participants, No. (%)	P Value *
<b>Fruits groups</b>			
Not used	7 (3.3)	15 (6.2)	0.003
Inappropriate use	41 (19.6)	44 (21.5)	0.003
Appropriate use	68 (32.5)	34 (16.3)	0.003
<b>Bread and cereals group</b>			
Not used	-	-	0.098
Inappropriate use	112 (53.6)	85 (40.7)	0.098
Appropriate use	4 (1.9)	8 (3.8)	0.098
<b>Fat group</b>			
Not used	-	2 (1)	0.672

Inappropriate use	29 (13.7)	25 (11.8)	0.672
Appropriate use	66 (31.6)	58 (27.7)	0.672
<b>Vegetables</b>			
Not used	2 (1)	9 (4.3)	0.021
Inappropriate use	50 (23.9)	35 (16.7)	0.021
Appropriate use	64 (30.6)	50 (23.9)	0.021
<b>Dairy group</b>			
Not used	3 (1.4)	9 (4.3)	0.01
Inappropriate use	37 (17.7)	40 (19.1)	0.01
Appropriate use	76 (36.4)	44 (21.1)	0.01
<b>Sweets</b>			
Not used	19 (9.1)	16 (7.7)	0.881
Inappropriate use	82 (39.2)	63 (30.1)	0.881
Appropriate use	15 (7.2)	14 (6.7)	0.881
<b>Protein groups</b>			
Not used	1 (0.5)	3 (1.4)	0.013
Inappropriate use	25 (12)	35 (16.7)	0.013
Appropriate use	90 (43.1)	55 (26.3)	0.013

\* P Values according to Fisher Exact Test.

Shimbo et al., study of 50 rural women in China found that wheat, rice and corn had the highest consumption rates in rural households (12). The results of these two studies were compatible with our findings. Waist circumference over 88 cm in women is associated with abdominal obesity and metabolic syndrome (13) the mean waist circumference of women who participated in this study was  $92.64 \pm 14$  cm. BMI up to  $25 \text{ kg/m}^2$  was considered normal and the mean BMI of participants were  $26.68 \pm 5.8$ . These results showed that people of Kaftarak village had a high average weight which may be due to their dietary pattern. A significant difference in mean BMI was found between low-literate and literate groups, so that those with higher education level had lower BMI. Also, significant difference in mean waist circumference was observed between low-literate and literate classes, and low literate group had higher waist circumference. Therefore it seems that those with higher education level tend to pay more attention to their health. Our findings indicated that individuals with higher education level had significantly lower BMI and waist circumference. The nutritional status of the household was affected by factors such as family income, culture, education, religion, and physical exercise. However, it appears that individuals with higher education level assume a better lifestyle. Meanwhile, we can conclude that people with higher education have a higher socioeconomic status and this will impact their choice of foods and their practice. Tavakoli et al., study on military personnel showed that the majority of staff had weak practice. In this study, no relationship was found between education and practice (14). Also Mohammadi and Khalaj study on the students

indicated that 2.3% had good nutritional practice (15). Our study was in contrasts with the findings of these two studies.

Only 49% of participants in our study used appropriate amount of fruits which seemingly could not afford because of inadequate income. Agriculture in Kaftarak is limited to wheat, corn and vegetables and there are no fruit gardens. There were no fruits in the daily diet of 10.5% of participants and the remaining subjects used fruit inappropriately. However, our findings showed that those with higher level of education used more fruits. Approximately 55% of subjects used vegetables properly. Ijarotimi et al., found that only 25% of Nigerians followed a suitable model for vegetables which was consumed less or none by 75% of the population (5). Lallukka et al., showed that fruit and vegetable consumption in Finland were two serving size per day and they also found that men with higher educational level used more fruits and vegetables. However, in Lallukka's study, no relationship was observed between women's education and fruit and vegetable consumption (6). Our findings were consistent with the results of these studies. It seems, however that low education groups need educating in regard to intake of fruits and vegetables. The study of Rashidkhani et al., on middle-aged women in Tehran indicated that socioeconomic factors impact nutritional patterns. There was no association between eating fat and sweet and educational level of participants (16).

It was notable that participants with higher education used dairy products and proteins more appropriately. Regardless of the household's economic situation, it seems that women with higher education had better nutritional

pattern. However, availability of food groups is an important factor. Nemati et al., conducted a study on rural population in Ardabil and found that most of the rural diets involved bread, potatoes, eggs, oil and tomato (8). The study of Samare et al., showed that rural women used more grain and dairy products than urban women (9). It seems that most women in our study take their calories from bread, rice and fats. Finally, increasing women's education will improve family pattern of nutrition. The limitation of our study was the lack of cooperation and willingness of women, of which the majority were housewives.

It seems that there is an inappropriate use of some food groups in rural areas that makes people vulnerable to overweight and obesity. Because of the significant association between consumption of fruits, vegetables, protein and dairy products and education level of participants, we suggest that increasing knowledge and adequate training of people in regard to nutritional needs would improve the quality of lifestyle among rural women.

Considering the indisputable effect of education on nutritional pattern, further investigations involving larger populations and other factors such as socio-economic status are needed to improve the quality of lifestyle among rural population.

### Acknowledgements

The authors gratefully acknowledge from Shiraz University of Medical Sciences.

### Authors' Contribution

Both authors contributed equally to this work.

### Financial Disclosure

There is no conflict of interest.

### Funding/Support

The Vice-Chancellor for Research at Shiraz University of

Medical Sciences Supported this project.

### References

1. Nemati A, Naghizadeh B. Assessment of nutritional status in postmenopausal women. *J Med Purification*. 2005;14(56):24-9.
2. Farahmand M, Tehrani FR, Amiri P, Azizi F. Barriers to healthy nutrition: perceptions and experiences of Iranian women. *BMC Public Health*. 2012;12:1064.
3. Mirmiran P, Mehrabi Y, Azizi F. Does the number of meals is associated with a reduced risk factors for non-communicable diseases? *Payeshjournal*. 2007;7(1):5-9.
4. *Food guide pyramid - center for nutrition policy and promotion*. No. 252 [database on the Internet].
5. Ijarotimi OS, Ekeh O, Ajayi OP. Nutrient composition of selected medicinal leafy vegetables in Western Nigeria. *J Med Food*. 2010;13(2):476-9.
6. Lallukka T, Pitkaniemi J, Rahkonen O, Roos E, Laaksonen M, Lahti E. The association of income with fresh fruit and vegetable consumption at different levels of education. *Eur J Clin Nutr*. 2010;64(3):324-7.
7. Lee JE, Kim JH, Son SJ, Ahn Y, Lee J, Park C, et al. Dietary pattern classifications with nutrient intake and health-risk factors in Korean men. *Nutrition*. 2011;27(1):26-33.
8. Nemati A, Majdipour A, Sagha M. The pattern of food consumption in rural population of Ardabil. 1999;2(8):51-8.
9. Samare S, Esmailzadeh A. Nutrition of pregnant women referred to health centers - Care Mako. *J Qazvin Univ Med Sci*. 2005;9(4):69-75.
10. Mirmiran P, Hosseini-Esfahanil F, Jessri M, Mahan LK, Shiva N, Azizi F. Does dietary intake by Tehranian adults align with the 2005 dietary guidelines for Americans? Observations from the Tehran lipid and glucose study. *J Health Popul Nutr*. 2011;29(1):39-52.
11. Azizi F, Ghanbarian A, Momenan AA, Hadaegh F, Mirmiran P, Hedayati M, et al. Prevention of non-communicable disease in a population in nutrition transition: Tehran Lipid and Glucose Study phase II. *Trials*. 2009;10:5.
12. Shimbo S, Zhang ZW, Qu JB, Xu GF, Song LH, Wang JJ, et al. Urban-rural difference in cereal consumption by people in Shandong Province, China. *Tohoku J Exp Med*. 1997;183(3):211-20.
13. Wiener C, Fauci A, Braunwald E, Kasper D, Hauser S. *Harrison's Principles of Internal Medicine*. 18th ed: McGraw Hill Professional; 2012.
14. Tavakoli HR, Sanai H, Karimi A, Tavakoli R. Study of knowledge, attitude and practice towards proper model of a system of food. *J Military Med*. 2008;10(2):129-36.
15. Khalaj M, Mohammadzadei A. Effect of health education on the nutritional behaviors of elementary school students in Qazvin. *J Shahrekord Univ Med Sci*. 2006;8(1):45-9.
16. Rashidkhani B, Shaneshin M. Validation of energy intake reporting and its association with dietary patterns in women aged 18 to 45 in Tehran. *Iran Food Sci Nutr*. 2009;4(3):63-74.