

Nutritional Knowledge, Attitude and Practice of North West Households in Iran: Is Knowledge likely to Become Practice?

Sakineh Nouri SAEIDLOU^a, Fariba BABAEI^b, Parvin AYREMLOU^a

^a Food and Beverage Safety Research Center, Urmia University of Medical Science, Urmia, Iran

^b Urmia University of Medical Science, Urmia, Iran

ABSTRACT

Background: Nutritional factors have an important role in the incidence of non-communicable diseases and they are strong predictors of cardiovascular risk among adolescents. This study was conducted to assess the Knowledge, Attitude and Practice (KAP) of urban and rural households towards the principles of nutrition in West Azerbaijan Province.

Design and methods: This cross sectional population based study was conducted among 455 urban and rural households. The sampling method at households' level in each area was the single stage cluster sampling. Data were collected by a structured questionnaire and through the interview with the eligible subject in each household. Analyses were performed using SPSS 20 statistical software. For qualitative data, results were presented as frequency and percentage.

Results: Out of a total of 455 households that were selected as overall sample size, 272 (59.8%) were in urban areas and 183 (40.2%) in rural areas. More than 50% of the households in both urban and rural areas were aware of food groups. More than 40% of the households in both urban and rural areas knew about the roles of food groups and the level of knowledge most frequently encountered was about the role of milk and dairy group in urban areas (88.6%). Vitamin intake associated with the role of fruits (68%) and vegetables (62.5%) had the highest frequency. Most of the respondents declared that they consumed certain foods for their effects related to health improvement and disease prevention. The results showed that 45.2-99.8% of them had favorable attitudes. Most of the households consumed red meat, poultry, egg and legumes weekly, whereas fish was eaten rarely. Fruits, vegetables, sugar and dairy were consumed daily in most of the households.

Conclusion: Higher nutrition knowledge is associated with better practice and diet quality. Our findings suggest that nutrition education should be integrated in a household training program.

Keywords: Nutrition, Knowledge, Attitude, Practice, Household, Iran

Address for correspondence:

Parvin Ayremlou

Postal address: Food and Beverages Safety Research Center, Gholipour street, Jaddeh Salmas, Urmia, Iran

Phone number: 009844-33457278, Fax: 00984433457277;

E-mail: p.ayremlou@gmail.com, saeedlou2003@yahoo.com, babaei707@yahoo.co

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INTRODUCTION

The World Health Organization has stated that nutrition is an input to and foundation for health and development. Proper nutrition makes people stronger and more productive (1). Healthy eating habits lead to a stronger immune system, less illness, and better health. Proper and healthy nutrition is a key to a better quality of life (2-6). Epidemiological studies have shown that changes in lifestyle during recent years, especially changes in nutritional habits, diet, types of food, and cooking time may be responsible for increasing rates of non-communicable diseases (7-10). Nutritional factors have an important role in the incidence of non-communicable diseases and they are strong predictors of cardiovascular risk among adolescents (11-13). Epidemiological evidence shows that there is an increased incidence of diseases such as Cardiovascular diseases, obesity, high blood pressure and cancer, which can be attributed to changes in both lifestyle and nutritional habits (14-16).

One of the main causes of nutritional problems, the lack of nutrition knowledge, results in poor practice, which causes serious harms such as malnutrition and various non-communicable diseases (17, 18). KAP (Knowledge, Attitudes and Practices) studies emerged in the 1950s from the need to measure opposition to family planning services (19). Since then, they have been used extensively in family planning and population studies to evaluate and guide existing programmes and their use has been extended to other areas of health, including nutrition (20). Nutrition-related KAP studies assess and explore peoples' KAP relating to nutrition, diet, foods as well as closely related hygiene and health issues (21, 22). KAP studies have been used for two main purposes: (I) to collect key information during a situation analysis, which can then feed into the design of nutrition interventions; and (II) to evaluate nutrition education interventions. In the context of nutrition-related projects or programmes, a situation analysis describes the type and magnitude of nutrition issues and identifies possible causes of the commonly observed nutritional problems. The findings of a situation analysis will help in planning a nutrition intervention aimed at alleviating the identified nutritional problems. KAP studies can contribute to a situa-

tion analysis by helping to determine the existing knowledge, attitudes and practices relating to nutrition, which identifies nutrition education priorities (23).

Iran, like many developing countries, is facing an increase in the prevalence of risk factors for non-communicable diseases due to changes in lifestyle, especially nutritional habits (9, 24, 25). Several studies indicate the relationship between nutrition and various diseases that may be due to poor knowledge and practices in nutritional habits (26-28). Some studies conducted in this region show that malnutrition and obesity has increased due unhealthy dietary habits (29-31). Therefore, using a dietary pattern method which considers a more comprehensive overview of the diet could provide more interpretable findings than studying single nutrients or foods. Awareness concerning the level of consumers' nutritional knowledge is useful for promoting dietary habits and teaching good eating habits, and proper nutritional behaviors lead to reduced disease and treatment costs (32-36). Given the high prevalence of non-communicable diseases and their risk factors, nutritional intervention is necessary to prevent these diseases (37). This study provides baseline data on the knowledge, attitude and practice of urban and rural households in North West (West Azerbaijan Province) of Iran for planning nutritional intervention programmes. □

MATERIAL AND METHOD

This cross sectional population based study was conducted to assess the Knowledge, Attitude and Practice (KAP) of urban and rural households towards the principles of nutrition in West Azerbaijan Province. We considered a mother or any member of the household who was above 15 years old and responsible for cooking meals in the family as index case for data gathering.

Subjects and sampling

The sampling method at households' level in each area was the single stage cluster sampling with equal size clusters (8 people in each cluster). Regarding the design effect of 1.5, the total sample size was estimated to be 456 (34 cluster in urban regions and 23 cluster in rural regions),

Variables		Urban (%)	Rural (%)	Total (%)
Sex	Male	13 (4.8)	3 (1.6)	16 (3.5)
	Female	259 (95.2)	180 (98.4)	439 (96.5)
Age group	<20 years old	3 (1.1)	6 (3.3)	9 (2)
	20-39 years old	122 (44.9)	99 (54.1)	221 (48.6)
	40-64 years old	128 (47.1)	73 (39.9)	201 (44.2)
	> 65 years old	19 (7)	5 (2.7)	24 (5.3)
Education	Illiterate	54 (19.9)	85 (46.7)	139 (30.6)
	Elementary school	55 (20.2)	58 (31.9)	113 (24.9)
	Middle school	38 (14)	14 (7.7)	52 (11.5)
	High school	82 (30.1)	18 (9.9)	100 (22)
	University	43 (15.8)	7 (3.8)	50 (11)

TABLE 1. Demographic characteristics of respondents in urban and rural households

but finally, 455 people took part in this study. To identify clusters, we obtained the list of all households in each population (urban and rural) from deputy of health based on last health census. For finding first household of each cluster, we used systematic random sampling. We provided the cumulative list of households in each area. The sampling interval was calculated (number of clusters in each area divided by the total number of households in the area). The first household of the first cluster was identified by randomly selecting a number between 1 and a figure lower than or equal to the sampling interval. The first household of the second cluster was located by adding the sampling interval to the random

Questions		Urban (%)	Rural (%)	Total (%)
1-Recognition of food groups	Bread, Grains and Rice	212 (77.9)	130 (71)	342 (75.2)
	Meat, Legume and Egg	227 (83.5)	130 (71)	357 (78.5)
	Milk and dairy group	170 (62.5)	91 (50)	261 (57.5)
	Fruits	157 (57.7)	80 (43.7)	237 (52.1)
	Vegetables	184 (67.6)	98 (53.6)	282 (62)
2-Roles of food groups	Bread, Grains and Rice	111 (40.8)	95 (51.9)	206 (45.3)
	Meat, Legume, Egg	140 (51.7)	56 (30.6)	196 (43.2)
	Milk and dairy group	240 (88.6)	109 (59.6)	349 (76.9)
3-Roles of fruits	Vitamin intake	223 (82.3)	85 (46.7)	308 (68)
	Mineral intake	56 (20.7)	56 (30.6)	112 (24.7)
	Dietary fiber intake	42 (15.5)	22 (12)	64 (14.1)
4-Roles of vegetables	Vitamin intake	204 (75.3)	92 (50.3)	296 (65.2)
	Mineral intake	78 (58.8)	51 (27.9)	129 (28.4)
	Dietary fiber intake	63 (23.3)	45 (24.6)	108 (23.8)
5-Reason of food eating	Growth	102 (37.5)	61 (33.3)	163 (35.8)
	Energy intake	154 (56.8)	110 (60.4)	264 (58.3)
	Health and prevention of diseases	172 (63.2)	104 (56.8)	276 (60.4)
6-Effect of high consumption of fast foods	Overweight and obesity	115 (42.4)	50 (27.3)	165 (36.3)
	Liver diseases	18 (6.6)	11 (6)	29 (6.4)
	Cancer	54 (19.9)	22 (12)	76 (16.7)
7-Roles of fibers	Cardiovascular diseases	58 (21.4)	23 (12.6)	81 (17.8)
	Prevention of cancers	20 (35.1)	7 (15.9)	27 (26.7)
	Prevention of diseases	16 (28.1)	7 (18.9)	23 (24.5)
	Help to bowel movements	38 (66.7)	17 (45.9)	55 (58.5)
	Prevention of overweight and obesity	23 (39.7)	11 (28.5)	34 (35.4)
8-Effects of fizzy drinks high consumption	Overweight and obesity	99 (36.8)	47 (26)	146 (32.4)
	Osteoporosis	104 (38.4)	49 (26.8)	153 (33.7)
	Malnutrition	52 (19.2)	25 (13.7)	77 (17)
	The loss of tooth enamel	28 (10.4)	18 (9.9)	46 (10.2)
9-Fat group	The liquid oil is the best oil for cooking	219 (80.8)	124 (67.8)	343 (75.6)
	The liquid oil is the best oil for frying	220 (81.5)	117 (63.9)	337 (74.4)
10-Harmful oils	Ghee	115 (42.9)	76 (41.5)	191 (42.4)
	Solid	214 (79)	130 (71)	344 (75.8)
11-Protein intake of non-meat group	Soya	148 (54.6)	58 (31.7)	206 (45.4)
	Legumes	145 (53.5)	76 (41.5)	221 (48.7)
	Egg	97 (35.8)	75 (41)	172 (37.9)
	Milk& dairy products	50 (18.5)	54 (29.5)	104 (22.9)

TABLE 2. Correct nutrition knowledge of urban and rural households in West Azarbijan Province

number. Non-Iranian households were excluded from the study. Also, households who were not present at the time of interview for three times were excluded from the survey.

Date collection

Data was collected by a structured questionnaire and through an interview with the eligible subject in each household. Interviews were done by trained experts. The questionnaires focused on the basic principles of nutrition, food groups, and sources of nutrients, nutrition-related diseases, and nutritional requirement at different life stages. The questionnaires were standardized and pilot tested for validity and reliability. The study manual of operations was evaluated and revised in the pilot study. The knowledge status was assessed by 11 items and categories of response were she/he knows and she/he does not know. Attitude was measured by 19 items and response categories were from 1 totally agree to 5 totally disagree. Practice was assessed by 23 items and answers ranged from daily to never. All analyses were performed using SPSS 20 statistical software. For qualitative data, results were presented as frequency and percentage. □

RESULTS

A total of 455 households were selected as overall sample size, of which 272 (59.8%) were located in urban areas and 183 (40.2%) in rural areas. More than 95% of the respondents were women; 47.1% of them were in the age group of 40 to 64 years in urban areas, and 54.1% in the age group of 20 to 39 years in rural areas. The most frequent category of education reported by the respondents was high school (30.1%) in urban areas and illiterate (46.7%) in rural areas (Table 1).

Table 2 shows the knowledge level of urban and rural households toward nutrition. More than 50% of households in both urban and rural areas were aware of food groups, except for the frequency of the level of knowledge about fruits, which was 43.7% in rural areas. More than 40% of households in both urban and rural areas knew about the roles of food groups and the most frequently encountered level of knowledge was about role of milk and dairy group in urban areas (88.6%). Vitamin intake associated with

the role of fruits (68%) and vegetables (62.5%) had the highest frequency. Most of the respondents declared that they consumed certain foods for their effects regarding health improvement and disease prevention. 42.4% and 27.3% of the urban and rural households, respectively, knew that high consumption of fast foods was a main risk factor for overweight and obesity. Totally, 58.5% of the households were aware that the role of fibers in the body was useful for bowel movements. Awareness of osteoporosis as a health problem related to the high consumption of fizzy drinks had the highest frequency among respondents (33.7%). Most of the households in both urban and rural areas declared that liquid oil was the best for cooking and frying, while 75.8% of all respondents knew that solid oil was harmful. The best level of knowledge about protein intake of non-meat group was about soya (54.6%) and legumes (48.7%) in urban and rural areas, respectively.

Table 3 highlight the favorable attitudes of households toward basic principles of nutrition. The results showed that 45.2-99.8% of the families had favorable attitudes in all items, except that only 24.4% of the households believed that the nutritional value of meat and mushrooms was different. More than 90% of the households had favorable attitudes about (1) the importance of nutrition and diet in human health, (2) the necessity to pay more attention to the nutritional needs of children than to those of adults, (3) the necessity of a daily intake of vegetables or salad, (4) the priority of drinking buttermilk instead of soda, and (5) not using chips as a snack for children.

Table 4 shows the practice of consumption based on region. Findings indicated that most of the households have never consumed fast foods (Sausages (55.5%), Pizza (46.3%) and Sandwiches (54.8%). Among all households, the frequency of daily consumption of fruits and vegetables was 84.8% and 78.9%, respectively. Most of the households consumed fish, tons, fizzy drinks and industrial juice rarely in both urban and rural areas. Results showed that more than half of the households consumed buttermilk daily, while milk, yoghurt or cheese were eaten daily by most of the urban and rural families (urban households 89.3% and rural households 90.7%). Most of the households have never used snacks. The frequency of weekly egg intake was 62.4

Topic	Urban (%)	Rural (%)	Total (%)
1-The importance of nutrition and diet in human health	271 (100)	182 (99.5)	453 (99.8)
2-The necessity of same food intake in both sexes when a small amount of food is in the households basket	192 (70.8)	120 (65.6)	312 (68.7)
3-The necessity to pay more attention to the nutritional needs of children than to those of adults	261 (96.3)	177 (96.7)	438 (96.5)
4-The necessity of eating main meals in weight loss diets	157 (58.4)	97 (53.6)	254 (56.4)
5- The priority of traditional foods upon fast food	249 (91.9)	148 (80.9)	397 (87.4)
6-The observing fitness in girls at puberty with consume less food	160 (59)	109 (59.6)	269 (59.3)
7-The priority of using fruits instead of bread when she/he is hungry	105 (38.7)	100 (54.6)	205 (45.2)
8- The necessity to have a daily intake of vegetables or salad	261 (96.3)	175 (95.6)	436 (96)
9- Reducing vitamins in vegetables by freezing	231 (85.2)	121 (66.1)	352 (77.5)
10-The priority of fish consumption instead tons	198 (73.1)	99 (54.1)	297 (65.4)
11- The priority of drinking buttermilk instead soda	246 (91.8)	165 (90.7)	411 (91.3)
12- Using of liquid oils instead of solid oils	231 (85.2)	125 (68.3)	356 (78.4)
13-The harmful consumption of fizzy drinks	201 (74.4)	117 (63.9)	318 (70.2)
14- The priority of low-fat dairy products	194 (71.6)	94 (51.4)	288 (63.4)
15- The daily milk intake in all age groups	230 (85.2)	161 (88.5)	391 (86.5)
16- Not using chips as a snack for children	256 (94.5)	163 (89.1)	419 (92.3)
17- Difference in the nutritional value mushrooms and meat	65 (24.2)	45 (24.7)	110 (24.4)
18- The priority of boiled foods	234 (86.3)	161 (88)	395 (87)
19- Wholemeal bread has more nutritional value than white bread	139 (51.9)	79 (43.2)	218 (48.3)

TABLE 3. Favorite nutrition attitude of urban and rural households in West Azarbijan Province

and 53.6% in urban and rural households, respectively. Red meat, legumes and poultry were eaten weekly in most of the households (red met 68.7%, legumes 49.6% and poultry 80.6%). Butter and cream were eaten daily by most of the urban families (37.7%), whereas most of the rural families (38.7%) consumed it weekly. 84.4% of the urban families and 90.6% of the rural families consumed sugar daily.

Table 5 shows the nutrition practice of urban and rural households regarding the type of dairy, bread, and oil consumption. Findings indicated that in all households, the consumption frequency of traditional and pasteurized (low fat) dairy was 50.3%, 40.8% and 8.8%, respectively. In both urban and rural areas, most of the families consumed white bread. Among households, the consumption frequencies of liquid oils for cooking and frying oils for frying were higher comparing to other types of oils. □

DISCUSSION

I ncreasing epidemic of obesity and chronic diseases is associated to unhealthy dietary habits worldwide (38-42). Raising people's awareness for healthy dietary habits is a complex task and therefore, a better knowledge of these patterns is required. Studies that access and analyse peo-

ple's nutrition-related knowledge, attitudes and practices (KAP) are a useful method for gaining such an insight into peoples' personal determinants of their dietary habits. They can thus provide valuable inputs for effective program and project planning.

The aim of this study was to assess knowledge, attitude and practice of urban and rural households toward the principles of nutrition. According to our findings, the urban and rural households' level of knowledge about recognition of food groups was acceptable. The results showed that most of the households were aware about the role of milk and dairy group, whereas the lowest level of knowledge frequency was for meat, legume and egg group. Most of the families declared that the importance of fruits and vegetables intake consists of providing vitamins, minerals and dietary fibers, respectively. Most of the households reported that they preferred to eat certain foods for their effects regarding health improvement and disease prevention. In both urban and rural areas, the households level of knowledge about the dairy group and the importance of fruits and vegetables in providing vitamins was good and acceptable, but it was weak about bread, grain and meat group as well as the role of fruits/vegetables in providing mineral and dietary fiber. Therefore, nutrition edu-

		Urban (%)	Rural (%)	Total (%)
1-Sausage	Daily	8 (3)	5 (2.7)	13 (2.9)
	Weekly	11 (4.1)	10 (5.5)	21 (4.6)
	Rarely	113 (41.7)	55 (30.1)	168 (37)
	Never	139 (51.3)	113 (61.7)	252 (55.5)
2-Pizza	Daily	12 (4.4)	9 (4.9)	21 (4.6)
	Weekly	11 (4.1)	5 (2.7)	16 (3.5)
	Rarely	141 (52)	66 (36.1)	207 (45.6)
	Never	107 (39.5)	103 (56.3)	210 (46.3)
3-Sandwich	Daily	7 (2.6)	8 (4.4)	15 (3.3)
	Weekly	27 (10)	14 (7.7)	41 (9)
	Rarely	107 (39.5)	42 (23)	149 (32.8)
	Never	130 (48)	119 (65)	249 (54.8)
4-Fruits	Daily	233 (87.3)	131 (72.8)	385 (84.8)
	Weekly	29 (10.9)	38 (21.1)	49 (10.8)
	Rarely	3 (1.1)	7 (3.9)	5 (1.1)
	Never	2 (0.7)	4 (2.2)	15 (3.3)
5-Vegetables	Daily	215 (79.3)	143 (78.1)	358 (78.9)
	Weekly	47 (17.3)	34 (18.6)	81 (17.8)
	Rarely	5 (1.8)	2 (1.1)	7 (1.5)
	Never	4 (1.5)	4 (2.2)	8 (1.8)
6-Fish	Daily	3 (1.1)	3 (1.6)	6 (1.3)
	Weekly	73 (26.9)	46 (25.1)	119 (26.2)
	Rarely	152 (56.1)	107 (58.5)	259 (57)
	Never	43 (15.9)	27 (14.8)	70 (15.4)
7-Tons	Daily	2 (0.7)	1 (0.5)	3 (0.7)
	Weekly	48 (17.7)	48 (26.2)	96 (21.1)
	Rarely	148 (54.6)	99 (54.1)	247 (54.4)
	Never	73 (26.9)	35 (19.1)	108 (23.8)
8-Fizzy drinks	Daily	11 (4.1)	17 (9.3)	28 (6.2)
	Weekly	53 (19.2)	36 (19.7)	88 (19.4)
	Rarely	155 (42.4)	89 (48.6)	244 (44.9)
	Never	93 (34.3)	41 (22.4)	134 (29.5)
9-Industrial juice	Daily	16 (5.9)	12 (6.6)	28 (6.2)
	Weekly	51 (18.8)	37 (20.2)	88 (19.4)
	Rarely	115 (42.4)	85 (46.4)	200 (44.1)
	Never	89 (32.8)	49 (26.8)	138 (30.4)
10-Buttermilk	Daily	148 (55.2)	126 (68.9)	247 (60.8)
	Weekly	96 (35.8)	42 (23)	138 (30.6)
	Rarely	19 (7.1)	9 (4.9)	28 (6.2)
	Never	5 (1.9)	6 (3.3)	11 (2.4)
11-Milk, yoghurt or cheese	Daily	242 (89.3)	166 (90.7)	408 (89.9)
	Weekly	22 (8.1)	13 (7.1)	35 (7.7)
	Rarely	6 (2.2)	3 (1.6)	9 (2)
	Never	1 (0.4)	1 (0.5)	2 (0.4)

TABLE 4 (part one). Nutrition practice of urban and rural households in West Azarbijan Province

		Urban (%)	Rural (%)	Total (%)
12-Snacks	Daily	19 (7)	11 (6)	30 (3.6)
	Weekly	49 (18.1)	38 (20.8)	87 (19.2)
	Rarely	77 (28.4)	59 (35.2)	136 (30)
	Never	126 (46.5)	75 (41)	201 (44.3)
13-Chocolate	Daily	25 (9.4)	14 (7.7)	39 (8.7)
	Weekly	71 (26.7)	48 (26.2)	119 (26.5)
	Rarely	115 (43.2)	80 (43.7)	195 (43.4)
	Never	55 (20.7)	41 (22.4)	96 (21.4)
14-Eggs	Daily	88 (32.5)	68 (37.2)	156 (34.4)
	Weekly	169 (62.4)	98 (53.6)	267 (58.8)
	Rarely	12 (4.4)	11 (6)	23 (5.1)
	Never	2 (0.7)	6 (3.3)	8 (1.8)
15-Red meat	Daily	34 (12.5)	18 (9.8)	52 (11.5)
	Weekly	187 (69)	125 (68.3)	312 (68.7)
	Rarely	45 (16.6)	35 (19.1)	80 (17.6)
	Never	5 (1.8)	5 (2.7)	10 (2.2)
16-Legumes	Daily	118 (43.5)	82 (44.8)	200 (44.1)
	Weekly	134 (49.4)	91 (49.7)	225 (49.6)
	Rarely	13 (4.8)	5 (2.7)	18 (4)
	Never	6 (2.2)	5 (2.7)	11 (2.4)
17-Poultry	Daily	29 (10.7)	24 (13.1)	53 (11.7)
	Weekly	225 (83)	141 (77)	366 (80.6)
	Rarely	14 (5.2)	12 (6.6)	26 (5.7)
	Never	3 (1.1)	6 (3.3)	9 (2)
18-Butter and cream	Daily	71 (26.2)	69 (37.7)	140 (30.8)
	Weekly	105 (38.7)	58 (31.7)	163 (35.9)
	Rarely	65 (24)	41 (22.4)	106 (23.3)
	Never	30 (11.1)	15 (8.2)	45 (9.9)
19-Sugar	Daily	227 (84.4)	164 (90.6)	391 (86.9)
	Weekly	10 (3.7)	7 (3.9)	17 (3.8)
	Rarely	15 (5.6)	9 (5)	24 (5.2)
	Never	17 (6.3)	1 (0.5)	18 (4)

TABLE 4 (part two). Nutrition practice of urban and rural households in West Azarbijan Province

cation is needed to get better knowledge of these aspects. Our finding showed that most of the households knew that fast food consumption could lead to overweight and obesity (36.3%), fibers were helpful for bowel movements (58.5%), fizzy drinks intake was a risk factor for osteoporosis (33.7%) and most of them (more than 70%) reported that liquid oil was the best oil

In a study by Alaunyte *et al.*, the findings revealed an adequate nutritional knowledge (mean 72.82%) of athletes with the highest scores in dietary advice section (85.71%), fol-

lowed by food groups (71.24%) and food choice (69.52%)(4). Fallah F *et al.* investigated the Effects of Nutrition Education on Levels of Nutritional Awareness of Pregnant Women in Western Iran. Their results indicated that, before the educational intervention, awareness levels were estimated to be weak (31%), moderate (66%) and good (3%). The corresponding rates after the educational intervention were weak (6%), moderate (63%) and good (31%). Pregnant women's awareness level about healthy nutrition was significantly increased from 3% before the intervention to 31% after the nutritional education

		Urban (%)	Rural (%)	Total (%)
1-Dairy	Traditional	114 (42.2)	114 (62.3)	228 (50.3)
	Pasteurized (low fat)	127 (47)	58 (31.7)	185 (40.8)
	Pasteurized(high fat)	29 (10.7)	11 (6)	40 (8.8)
2-Bread	Lavash (white)	233 (86)	134 (73.6)	367 (81)
	Taftoon (white)	7 (2.6)	5 (2.7)	12 (2.6)
	Sangak (wholegrain)	26 (9.6)	18 (9.9)	44 (9.7)
	Barbary (wholegrain)	2 (0.7)	0 (0)	2 (0.4)
	Baget (white)	2 (0.7)	2 (1.1)	4 (0.9)
	Traditional (white)	1 (0.4)	23 (12.6)	24 (5.3)
3-Cooking oil	Solid oils	87 (32.2)	67 (37)	154 (34.2)
	Liquid oil	130 (48.3)	69 (38)	199 (44.3)
	Butter and others	52 (19.4)	45 (25)	97 (21.5)
4-Frying oil	Solid oils	37 (13.7)	36 (19.7)	73 (16.1)
	Liquid oil	25 (9.3)	29 (15.8)	54 (11.9)
	Frying oils	183 (67.5)	92 (50.3)	275 (60.6)
	Butter and others	26 (2.5)	25 (14.2)	52 (11.4)

TABLE 5. Nutrition practice of urban and rural households about type of dairy, bread, oil consumption in West Azarbijan Province

intervention (32). Sichert-Hellert *et al.* reported that in the total sample, more than 50% of the respondents were answered correctly and between 22% and 93% of participants answered the single questions correctly. Webb *et al.* reported that respondents gave correct answers to less than 50% of the survey questions. Participants scored below 50% for 10 of the 21 nutrition knowledge questions (43).

The current study showed that 45.2-99.8% of the families had favorable attitudes in all items, except that only 24.4% of the households believed that the nutritional value of meat and mushrooms was different. Webb *et al.* reported that the mean score for attitude towards nutrition for the entire sample was 41.69 ± 6.215 . The highest score was 55 (100%) and the lowest 19 (34.55%)(33). In a study by Sharma *et al.* when assessing nutrition attitudes, 54% of the teachers agreed with the statement that it was hard to know which nutrition information to believe and 9% agreed that their nutrition habits were healthy. Most teachers (78%) agreed that being overweight increases health risks, and 93% agreed that learning the relationship between health and nutrition was important (44).

In the present study, more than half of the households have never consumed sausages and sandwiches, while less than 5% of them eaten

fast foods daily. Positive associations were found between fast food consumption and increased risk of abdominal obesity and hypertriglyceridemia. Sausage, French fries and pizza consumption was associated with a higher risk of incident metabolic syndrome (45). In both urban and rural areas, more than 70% of the household's fruits and vegetables intake was daily; therefore, nutritional knowledge was positively correlated to fruits and vegetables consumption by families. In Sharma's *et al.* study, nearly $\frac{1}{4}$ of the teachers reported that they had not eaten fruits (26%) or vegetables (23%) the previous day, one of three (32%) consumed at least one fruit flavored beverage (e.g., fruit punch, sports drinks), and 44% had at least one soda on the previous day (44). The present study showed that the frequency of daily, weekly and seldom consumption of fish by families was 1.3%, 26.2% and 57%, respectively. Consumption of fish and n-3 (ω -3) poly-unsaturated fatty acids was associated with a lower risk of pancreatic cancer and other diseases (46-48). Our findings showed that most of the households used to eat tons, fizzy drinks and industrial juice rarely. In all households, buttermilk (60.8%) and milk, yoghurt or cheese (nearly 90%) was consumed daily. Wang H *et al.* determined greater intakes of total dairy foods; total low-fat/fat-free dairy foods, low-fat/skimmed milk and yoghurt

were associated with smaller annualized increments in systolic blood pressure and a lower risk of projected hypertension incidence. Total dairy and total low-fat/fat-free dairy intakes were found to be inversely related to changes in diastolic blood pressure (49). In another study, the association between consumption of different types of dairy products and long-term changes in weight and waist circumference among American adults with an average follow-up of 13-years was examined (50). Our findings showed that 19.2% of the households consumed snacks weekly. The frequency of weekly egg, red meat, legumes and poultry consumption was 58.8%, 68.7%, and 49.6%, respectively; 80.6% of these was acceptable. Elevation of blood cholesterol concentrations has been recognized as a major risk factor for cardiovascular diseases and higher snack dietary pattern scores predicted a higher risk of hypercholesterolemia (51). Present study showed that, in both urban and rural areas more than 80% of the families consumed sugar daily. Most of the households consumed white bread and liquid oil for cooking.

In summary, although nutrition knowledge has been identified as an unreliable predictor of behavioral change, research suggests that nutrition knowledge is a critical factor in promoting favorable dietary and health changes. Results indicate that nutrition knowledge can impart favorable dietary and healthy behavioral changes. □

CONCLUSION

A higher level of nutrition knowledge is associated with better practice and diet quality. Findings suggest that nutrition education should be integrated in household training programmes. Data from this study provided some useful information which could be used to develop areas of an intervention program for families. □

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