PJN
ISSN 1680-5194

PAKISTAN JOURNAL OF NUTRITION

ANSInet
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
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Pakistan Journal of Nutrition 6 (6): 538-542, 2007
ISSN 1680-5194

Survey on the Nutrition Knowledge Level of Turkish Physicians: Ankara as a Sample

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Abstract: Several studies indicate that physicians have little nutrition knowledge. The survey was carried out to determine the nutrition knowledge of physicians in Turkey. The research data were collected by means of a questionnaire including multiple-choice questions. The study was conducted among randomly selected 210 physicians (male: 137, female: 73) working in various hospitals in Ankara. The average score of the nutrition knowledge score of the physicians was 9.6±2.6. According to this result, the average rate of the correct responses was 48.1%±13.1. The responses of the physicians to the nutrition knowledge questions were evaluated by the method of scoring them. It was found that the nutrition knowledge level of 60.0% of the physicians was mediocre, that of 33.8% was poor and that of 6.2% was good. More nutrition subjects should be included in the curriculums of medical education and later, in-service training should support them.

Key words: Physicians, nutrition knowledge, nutrition education

Introduction

The World Health Organization (WHO) defines health as "a state of complete physical, mental and social well-being, not merely the absence of disease and infirmity" (Blair, 2001). Although factors such as genetic heritage, environment, life styles and culture are relevant for health, physical activities and nutrition are of great importance (Duyyf, 2002). Nutrition is the primary condition for growth and development, being resistant to diseases and living a long and healthy life by keeping the mind and body work at the highest level (Baysal, 1989; Teko, 1999). The role of nutrition in health promotion, disease prevention and treatment of chronic disease is well recognized (Hu *et al*., 1997; Schaller and James, 2005). Nutrition knowledge is one of the factors that affect the nutritional habits of individuals, families and communities (Köksal and Kirli, 1988).

Diet is now considered to play a substantial role in the etiology of many chronic degenerative diseases such as coronary heart disease, atherosclerosis, non-insulin dependent diabetes mellitus, osteoporosis and some cancer types such as bowel, stomach, breast and prostate cancers (Turrell, 1997). Nutrition is cited as the most controllable risk factor affecting long-term health (Schaller and James, 2005; Warber *et al*., 2000). The idea that nutrition is an important aspect of medical care dates back to the time of Hippocrates (Lazarus, 1997). Most individuals generally regard their physicians as the primary source of such information (Hu *et al*., 1997).

Yet, as it can also be seen in the studies given below, the nutrition knowledge of doctors is inadequate.

Podell *et al*. (1975) assessed the clinical nutritional knowledge of medical students and practicing physicians. It was found that the nutrition knowledge was modest .

Yurttagül and Sevilen (1988) asserted in their study conducted to determine the nutrition knowledge level of the senior students at three medical faculties that 38.5% of the students answered the questions correctly.

Nutritional knowledge was investigated among primary care physicians in the Taiwan area. The physicians who participated in the research answered 59% of the total knowledge questions correctly, with a tendency to score higher on general knowledge than clinical nutrition (Hu *et al*., 1997).

The nutrition knowledge of physician assistants in Texas was examined by Demory-Luce and McPherson (1999). The survey data were collected by means of mail. The questionnaire was completed by 764 physicians. A mean knowledge score of 70% was found. It was determined that knowledge scores were significantly related to the level of education but not to other demographic variables (age, year of graduation, length of practice).

In the research carried out by Temple (1999) in Alberta, Canada, the average correct response of 84 doctors was determined to be 63.1%. The subjects that were best known by the physicians were the nutrient associated with the prevention of neural tube defects (folate), common nutrient deficiency in alcoholics (thiamine) and a nutrient which was not an antioxidant (zinc). The least known subjects were the nutrient believed to help protect against thrombosis (omega-3 fatty acids), the association between excess protein intake and calcium loss, and the type of dietary fiber that helps lower the blood cholesterol level (soluble).

The nutritional knowledge level of 184 clinical doctors was investigated through questionnaires. The results showed that clinical doctors did not have enough nutritional knowledge to meet the demands of their work.

Table 1: Nutrition knowledge questions

1.	Excess of which nutrient may increase body calcium loss:		
a.	Protein *	b) Saturated fat	c) Potassium
2.	What type of dietary fiber is helpful in lowering the blood cholesterol level?		
a.	Wheat bran	b) Soluble fiber *	c) Insoluble fiber
3.	A major type of fatty acids olive oil is:		
a.	Saturated fatty acids	b) Polyunsaturated fatty acids	c) Monounsaturated fatty acids *
4.	Which nutrient is protective against hypertension:		
a.	Potassium *	b) Chloride	c) Iron
5.	A nutrient believed to help prevent trombosis is:		
a.	Omega -3 fatty acids *	b) Selenium	c) Vitamin E
6.	Which vitamin has the most toxic effect when consumed excessively for a long time?		
a.	Vitamin A	b) Vitamin E*	c) Vitamin D
7.	Which substance raises the blood HDL-cholesterol level:		
a.	Alcohol *	b) Animal protein	c) Riboflavin
8.	What percentage of the daily total energy should come from fats?		
a.	15-20%	b) 25-30% *	c) $\geq$ 35 %
9.	The most concentrated source of vitamin B_{12} is:		
a.	Fruit	b) Legumes	c) Meat*
10	A type of food believed to have a preventive effect on various types of cancer is:		
a.	Fruit and vegetables*	b) Milk	c) Meat
11.	The number of kilocalories in one gram of fat is:		
a.	4	b)7	c) 9*
12	Which of the following is not an antioxidant nutrient:		
a.	Vitamin E	b) Beta-carotene	c) Iron*
13.	A common nutrient deficiency in alcoholic is:		
a.	Vitamin B_1 (thiamin) *	b) Iron	c) Protein
14.	The nutrient strongly associated with the prevention of neural tube defects is:		
a.	Folate*	b) Zinc	c) Beta-carotene
15.	Compared with unprocessed vegetable oil, hydrogenated fats contain:		
a.	More unsaturated fatty acids	b) More trans fatty acids *	c) More cholesterol
16.	Which of the following foods is a rich source of lycopene?		
a.	Milk	b) Tomatoes *	c) Cauliflower
17.	Which of the following foods have the lowest glycemic index?		
a.	Ice cream*	b) Rice	c) Banana
18.	Which of the following is the main fatty acid in the egg?		
a.	Monounsaturated*	b) Polyunsaturated	c)Saturated
19.	How is the body weight of an adult whose body mass index is between 25.0-29.9 kg/m^2 rated?		
a.	Underweight	b) Normal weight	c) Overweight *
20.	Short-term diets are usually successful at achieving weight loss because they:		
a.	Decrease appetite	b) Cause the body to lose water*	c) Burn large amount of stored fat

*Indicate the correct answer

It was found that the doctors' fundamental nutritional knowledge was better than their clinical nutritional knowledge (My *et al.*, 2000).

Özçelik and Sürücüoglu (2000) conducted research to determine the nutritional knowledge of 300 (168 male, 132 female) physicians. It was found that the nutritional knowledge levels of 5.3, 82.4 and 12.3% of the doctors were good, mediocre and poor respectively.

Flynn *et al.* (2003) conducted research to assess the nutrition knowledge of physicians on the basic effects of diet on blood lipids and lipoproteins. It was determined that 26% did not know that olive oil was a good source of monounsaturated fatty acids .

In another study carried out in Riyad, Saudi Arabia, it was found that the mean score for the correctly answered questions was 51.7%. Approximately 75% of the physicians described their knowledge as "poor" (Al-Numeir, 2004).

As there are only few published data about nutritional knowledge of physicians in Turkey, the aim of the current

Table 2: Some demographic information about the physicians

	n	%
Gender		
Male	137	65.2
Female	73	34.8
Age (year)		
≤ 30	47	22.4
31-40	94	44.8
≥ 41	69	32.8
Specialization		
Not specialized	53	25.2
Specialized	157	74.8
Length of time since graduation (years)		
≤ 10	95	45.2
11-20	79	37.6
≥ 21	36	17.2
Total	210	100.0

study was to determine the nutrition knowledge level of the physicians working in Ankara, Turkey.

Materials and Methods

This research was conducted among randomly selected 210 physicians (male:137, female:73) working in various hospitals in Ankara, Turkey. The research data were collected by means of a questionnaire. The questionnaire form was composed of two sections. Part 1 was a demographic survey in which the respondents were asked about their sex, age, years of graduation and whether they have specialized or not.

Part 2 was a knowledge survey. There were 20 questions, each of which had three choices, in the nutrition knowledge section. The knowledge questionnaire was adapted and modified from Temple (1999) and Al-Numeir (2004). The 20 questions on which the results were based are given in Table 1. Each correct answer was assigned 1 point and the nutrition knowledge level was assessed out of 20 total points. Accordingly, the nutrition knowledge levels were scored as follows: 17-20 points, very good; 13-16 points, good; 9-12 points, mediocre; 8 points and below, poor.

The research data were analyzed by means of the SPSS (Statistical Package Social Sciences) program. Descriptive statistics were used to display data in frequencies, percentages and mean. In evaluating the nutrition knowledge level, gender, age, educational status and the graduation year were taken as explanatory variables. As statistical analyses, the Chi-square significance test, t test, the One way (ANOVA) variance analysis and the Scheffe test were applied (Kesici and Kocabas, 1998).

Results and Discussion

Some demographic information about the physicians who were involved in the research is presented in Table 2. The average age of the physicians was 36.7±7.0 and most of them were between the ages 31-40 (44.8%). Sixty-five point two percent of the participating physicians were male and 34.8% were female. It was determined that 74.8% of the physicians were specialized and 25.2% were general practitioners. Forty-five point two percent of the participants worked as a doctor, and the average length of time since graduation was 12.8±7.7.

Table 3 shows the simplified form of questions and the correct percentage of answers.

As can be seen in Table 3, only 5 of the 20 questions were answered correctly by more than 70.0% of the physicians (questions 5, 8, 10, 11 and 16) while 3 questions were answered by less than 10.0% (questions 1, 2, 7). The best known item (answered correctly at the highest rate) by the physicians is that "tomatoes are rich in lycopene" (90.0%). This is followed by the preventive action of fruits and vegetables against cancer and the energy value of fat (9 kcal/g) (both at 84.8%); and the preventive value of omega-3 fatty acids against thrombosis and the proportion of the daily total energy that comes from fats (both 70.5%).

The physicians involved in the research have the least knowledge about the association between excess protein intake and calcium loss (1.4%). Two other items that physicians have little knowledge about are that alcohol increases the HDL-cholesterol level (3.8%) and that soluble fiber help drop blood cholesterol level (8.1%).

In the other studies conducted, it was also determined that the items about the association between excess protein intake and calcium loss and dietary fiber's being helpful in lowering the blood cholesterol were among the least known topics (Temple, 1999; Özçelik and Sürücüoglu, 2000; Al-Numeir, 2004).

The responses of the physicians to the nutrition knowledge questions were evaluated by the method of scoring them. It was found that the nutrition knowledge level of 60.0% of the physicians was mediocre, that of 33.8% was poor, and that of 6.2% was good. There were not any physicians whose nutrition knowledge was at a "very good" level.

The nutrition knowledge levels of the physicians according to explanatory variables are shown in Table 4. The results show that the highest rates of good nutrition knowledge are in the following groups: men (7.3%); ≥41-age group (11.6%); those who are specialized (6.4%); and those who graduated from university 11-20 years ago (10.1%). The proportion of those whose nutrition knowledge level is poor is high among women (35.6%), = 30-age group (46.8%), those who did not specialize (49.0%) and those who graduated from university = 10 years ago (49.5%). By means of the chi-square analyses, it was found that the differences between the nutrition knowledge level as per age, being specialized and the time of graduation were statistically significant ($p<0.01$, $p<0.05$, $p<0.001$).

The average score of the nutrition knowledge level of the physicians was 9.6±2.6 in general. According to this result, the average rate of the correct responses was 48.1%±13.1.

Table 3: Questions Asked, Correct Answers and Percentage of Physicians with Correct Answers

No.[1]	Question[2]	Correct answer	%
1	Excess increases body calcium loss	protein	1.4
2	Type of dietary fiber that helps lower the blood cholesterol level	soluble	8.1
3	Major type of fatty acids in olive oil	monounsaturated	39.0
4	Nutrient protective against hypertension	potassium	19.5
5	Nutrient believed to help protect against thrombosis	omega-3 fatty acids	70.5
6	Nutrient least likely to cause toxicity	vitamin E	34.4
7	Substance that raises the blood HDL-cholesterol level	alcohol	3.8
8	The proportion of the daily total energy that comes from fats	%25-30	70.5
9	Most concentrated source of vitamin B_{12}	meat	22.9
10	Type of food believed to have a preventive effect on various types of cancer	fruit and vegetables	84.8
11	Number of kilocalories in one gram of fat	9	84.8
12	Not an antioxidant nutrient	iron	44.8
13	Common nutrient deficiency in alcoholics	thiamin	67.1
14	Nutrient strongly associated with the prevention of neural tube defects	folate	62.4
15	Compared with unprocesed vegetable oil, hydrogenated fats contain	more trans fatty acids	51.4
16	The food rich in lycopene	Tomatoes	90.0
17	The food with the lowest glycemic index	Ice cream	17.6
18	The main fatty acid in the egg	Mono-unsaturated	56.7
19	The body weight of an adult whose BMI is 25.0-29.9kg/m^2	Overweight	66.7
20	"Diet" plans are usually successful at achieving weight loss	Cause the body to lose water	67.6

[1]Answers arranged in order of percentage correct, [2]Questions are given here in an abbreviated form. A choice of three answers was given see Table 1 for full list of questions

Table 4: The nutrition knowledge levels of the physicians according to explanatory variables

	Good		Mediocre		Poor		
Variables	n	%	n	%	n	%	Statistics
Gender							Chi^2 = 0.64
Male	10	7.3	82	59.9	45	32.8	df = 2
Female	3	4.1	44	60.3	26	35.6	p>0.05
Age (year							Chi^2 = 17.26
≤ 30	3	6.4	22	46.8	22	46.8	df = 4
31-40	2	2.1	55	58.5	37	39.4	p<0.01
≥ 41	8	11.6	49	71.0	12	17.4	
Specialization							Chi^2 = 7.46
Not specialized	3	5.7	24	45.3	256	49.0	df = 2
Specialized	10	6.4	102	64.9	45	28.7	p<0.05
Years of graduate							
≤ 10	3	3.1	45	47.4	47	49.5	Chi^2 = 25.2
11-20	8	10.1	50	63.3	21	26.6	df = 4
≥ 21	2	5.6	31	86.1	3	8.3	p<0.001
Total	13	6.2	126	60.0	71	33.8	

Table 5: The average scores of nutrition knowledge of the physicians, the t test and the variance analysis results according to the explanatory variables

Variables	n	mean±SD	Tests	p	Differences
Gender					
Male	137	9.67±2.85	t = 0.39	p>0.05	
Female	73	9.52±2.06			
Age (year)					
≤ 30	47	8.89±2.46			1-3
31-40	94	9.04±2.52	F = 13.98	p<0.001	2-3
≥ 41	69	10.90±2.36			
Specialization					
Not specialized	53	8.81±2.19	t = 2.42	p<0.05	
Specialized	157	9.84±2.69			
Years of graduated					
≤ 10	95	8.82±2.20	F = 13.14	p<0.001	1-2
11-20	79	9.84±2.94			1-3
≥ 21	36	11.25±1.92			2-3

The average scores of nutrition knowledge and the results of the t test and the variance analysis in terms of the explanatory variables are presented in Table 5.
It was determined that the average nutrition knowledge scores of the physicians participated in the research varied according to their age ($p<0.001$), their specialization ($p<0.05$) and when they were graduated ($p<0.001$) and this is statistically significant. When the age variable is considered, the difference between the average scores of those in the $\geq$ 41 age group and those of the two other age groups is significant, and when the graduation year is considered, the difference between the average scores of the three groups is significant. No significant difference was found in terms of sex ($p>0.05$). In the study conducted by Özçelik and Sürücüoglu (2000), it was established that being specialized influenced the nutrition knowledge level and the average. Most of the students studying at different grades of the medical faculty find the nutrition lessons inadequate (Özen *et al.*, 2006). Another study revealed that the nutrition education program increased the nutrition knowledge level of physicians (Lazarus, 1997).

Conclusions: The results of the research indicate that the nutrition knowledge level of physicians is inadequate. The average knowledge scores are higher for men than women; for 41 and above than other age groups, for those specialized than non-specialized, and for those who graduated from university 21 or more years ago than the other groups. Early intervention to provide a healthy diet may have an enormous impact in disease prevention. Disease prevention is more cost effective than treatment. In the hospitals where there are dietitians, patients can get information about nutrition and diets from them. In other hospitals where no dietitians work, on the other hand, physicians inform the patients about nutrition. For this reason, more nutrition subjects should be included in medical education and later this education should be reinforced with on-the-job in-service training.

Acknowledgements

All the physicians who gave up time to participate in this study are warmly acknowledged.

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