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Nutrition Knowledge Level of Nurses in Turkey: Ankara as an Example

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Abstract: This study was planned and conducted to determine the nutrition knowledge level of nurses. Two hundred and sixty nurses, who work at various hospitals in Ankara and who were selected randomly, participated in the research. The average age of the nurses was 30.72±6.46. 57.7% of the nurses had an undergraduate degree and 11.9% had graduate degrees (master's + doctorate). It was determined that the nutrition knowledge level of 32.7% of the nurses was good, that of 56.9% of the nurses was adequate and that of 10.4% of the nurses was inadequate. None of the nurses had a nutrition knowledge level of very good. The average score of the nurses on nutrition knowledge was found to be 11.37±2.15. Those who had a good level of nutrition knowledge were at the highest proportions in the 31-35 age group (41.3%), in the group who had a graduate degree (45.2%) and in the group who had worked as a nurse for 11-15 years (50.9%). It was found that the educational status and length of working experience had a statistically significant influence on the nutrition knowledge level. It is believed that a continuing nutrition education for nurses will contribute to the recovering process of the patients.

Key words: Nurses, nutrition, knowledge, hospitals, Ankara

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). 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 (Schaller and James, 2005). Nutrition is cited as the most controllable risk factor affecting long-term health (Warber *et al*., 2000; Schaller and James, 2005). Nutrition knowledge is one of the factors that affect the nutritional habits of individuals, families and communities (Koksal and Kyrly, 1988). Whilst dieticians and nutritionists specialize in imparting nutrition information to consumers, nurses also provide nutrition information as part of their work (Schaller and James, 2005). The objective of this study was to determine the nutrition knowledge level of nurses.

Schaller and James (2005) carried out a study in Australia in order to determine the nutrition knowledge of 103 nurses. It was found that the mean knowledge scores for all nurses were 60%. Being experienced in the profession has positive influence on nutrition knowledge.

In a study conducted by Crogan *et al.* (2001), the average score of 44 nursing home nurses on a nutrition knowledge questionnaire was 65%. The difference between the scores of registered nurses and licensed practical nurses was found to be significant.

In their study, Crogan and Evans (2000) tested an evidence-based nutrition education program for licensed nurses working in a nursing home. The average pre-test and post-test scores were found to be 56 and 66%, respectively. It was asserted that the lack of basic nutrition knowledge continued in spite of the education support.

Warber *et al.* (2000) worked with 68 nurse practitioners. The overall mean nutrition knowledge test score was found to be 66% correct.

In the research done by Cadman and Findlay (1998) it was determined that the nutrition knowledge increased significantly after the education provided.

Thomas (2006) gave nutrition education to mental health nurses through a simple nutrition information booklet. A test was applied before and after the education. While 33 nurses completed the pre-test, the post-test was completed by eight nurses. It was found that only some areas of nurses' nutrition knowledge increased after the nutrition education (reading the nutrition information booklet). It was concluded that the

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Table 1: Nutrition knowledge questions

1.	Which is the following is the bulding block of proteins		
	a) Folic acid	b) Amino acids*	c) Acetic acid
2.	Which of the following is the vitamin that dissolves in water?		
	a) Vitamin A	b) Vitamin D	c) Vitamin C *
3.	Which of the following facilitates the absorption of iron?		
	a) Fats	b) Calcium	c) Vitamin C*
4.	Which of the following mineral groups has a role in the formation of bones and teeth?		
	a) Calcium-phosphorus*	b) Magnesium-chromium	c) Selenium-iron
5.	How much is your daily average energy requirement?		
	a) 1300-1600 kcal	b) 1800-2500 kcal *	c) 2700-3200 kcal
6.	Which type of diet fibre helps the blood cholesterol level drop?		
	a) Cereal bran	b) Fibre soluble in water *	c) Fibre insoluble in water
7.	Which of the following is the main fatty acid type in olive oil?		
	a) Saturated	b) Polyunsaturated	c) Monounsaturated *
8.	Which of the following nutrients is preventive against high blood pressure?		
	a) Potassium (K^+) *	b) Chlorine (Cl^-)	c) Iron (Fe^{++})
9.	Which of the following increases the HDL cholesterol level in blood?		
	a) Alcohol *	b) Animal protein	c) Riboflavin (Vitamin B_2)
10.	What percentage of the daily total energy intake must come from fats?		
	a) 15-20%	b) 25-30% *	c) 35% and above
11.	Which of the following is the best source of vitamin B_{12}?		
	a) Fruits	b) Leguminous seeds	c) Meat*
12.	Which of the following food types is believed to have a preventive effect on various cancer types?		
	a) Fruits-vegetables *	b) Milk	c) Meat
13.	How much calorie is released in the body when one gram of carbohydrate is burnt?		
	a) 4 kcal*	b) 7 kcal	c) 9 kcal
14.	Which of the following is not an antioxidant nutrient?		
	a) Vitamin E	b) Beta carotene	c) Iron (Fe^{++})*
15.	Which of the following is the nutrient effective in preventing Neural Tube Defect?		
	a) Folic acid *	b) Zinc (Zn^{++})	c) Beta carotene
16.	Which of the following types of food is the richest source of lykopene?		
	a) Milk	b) Tomatoes*	c) Cauliflowers
17.	The glycemic index of which of the following types of food is the lowest?		
	a) Ice-cream *	b) Rice	c) Bananas
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.	Which of the following is the best way of losing weight?		
	a) Eating a lot of grapefruit	b) Not eating breakfast	c) Increasing physical activity and decreasing food intake *

*Denotes the correct answer

nutrition education given through written material only was not an appropriate technique for the nurses.

Kgaphola *et al.* (1997) assessed the nutrition knowledge of clinic nurses in Lebowa, South Africa. It was determined that the nutrition knowledge of the clinic nurses was poor. Out of 40 nutrition knowledge questions, an average of 14±3.8 was answered correctly.

MATERIALS AND METHODS

This research was conducted among randomly selected 260 nurses 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: general information and nutrition knowledge questions (Table 1).

There are 20 questions, each of which has three choices, in the nutrition knowledge section. Each correct answer has been assigned 1 point and the nutrition knowledge level has been assessed out of 20 total points. Accordingly, the nutrition knowledge levels have been scored as follows: 17-20 points, very good; 13-16 points, good; 9-12 points, adequate; 8 points and below, inadequate.

The research data were analyzed by means of the SPSS (Statistical Package Social Sciences) program. In evaluating the nutrition knowledge level, age, educational status and the length of working period were taken as explanatory variables. As statistical analyses, the Chi-square (X^2) significance 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 nurses who were involved in the research is presented in Table 2. The average age of the nurses is 30.72±6.46 and most of them

are between the ages 26–30 (34.6%). 57.7% of the nurses have an undergraduate degree and 11.9% have a graduate degree (master's and doctorate). 32.3% of the participants have been working as a nurse for 6-10 years; and the average length of working experience is 10.81±6.52.

In Table 3, the percentage distributions of the nurses who answered the nutrition knowledge questions correctly are presented.

It was determined that 90.0% of the nurses involved in the research knew about the best way of losing weight (97.7%), the building block of the proteins (97.3%), the mineral group that has a role in the formation of bone and teeth (90.4%) and the food type that is believed to have a preventive effect on various cancer types (90.0%).

The topics that were known by less than 50% of the nurses are as follows: the food type with the lowest glycemic index (17.3%), the factor that increases the HDL-cholesterol level in blood (13.1 %), the main fatty acid type in the egg (20.8%), the diet fibre type which helps the blood cholesterol level drop (28.5%) the basic fat acid type in olive oil (38.8%) and the best source of vitamin B_{12} (43.8%) (Table 3).

Fifty one point two percent of the nurses involved in the research knew that the body weight of an adult with a body mass index of 25.0-29.9 kg m^{-2} would be rated as overweight. Thomas (2006) gave nutrition training in a study she conducted. While very few of the nurses defined the BMI (Body Mass Index) calculation formula correctly prior to the training, it was determined that all the nurses had learnt the formula after the training.

In the same research, Thomas (2006) found that the nurses had difficulty in remembering the food types that are rich in fibre before and after the training. Similarly, in this research, it was found that the proportion of the nurses who knew the diet fibre type that helps to decrease the blood pressure was low (28.5%).

In their study carried out on clinic nurses, Kgaphola *et al.* (1997) determined that the questions on weight gain, calorie content, catabolism, snacking, transferring and refrigeration had the highest rate of incorrect responses. A question on fibre had the highest correct score, followed by questions on calcium sources, vitamin A, meat substitution and dental caries.

The responses of the nurses to the nutrition knowledge questions were evaluated by the method of scoring them. It was found that the nutrition knowledge level of 32.7% of the nurses was good, that of 56.9% was adequate and that of 10.4% was inadequate.

Kgaphola *et al.* (1997) established that the general nutrition knowledge level of the clinic nurses was poor. In Cadman and Findlay's (1998) study, practice nurses were

Table 2: Some demographic information about the nurses

	n	(%)
Age (years)		
≤25	51	19.6
26-30	90	34.6
31-35	63	24.3
≥36	56	21.5
Education		
Secondary education	79	30.4
Undergraduate	150	57.7
Graduate	31	11.9
Length of working experience (years)		
≤5	62	23.8
6-10	84	32.3
11-15	55	21.2
≥16	59	22.7
Total	260	100.0

Table 3: Questions, correct answers and the percentage of nurses who answered the questions correctly

Question No[1]	Questions[2]	Correct answers	Correct (%)
1.	The element that is the building block of protein	Amino acids	97.3
2.	The vitamin which dissolves in water	Vitamin C	82.3
3.	The nutrient which facilitates the absorption of iron	Vitamin C	60.0
4.	The mineral group which has a role in the formation of bones and teeth	Calcium-phosphorus	90.4
5.	Daily average energy requirement	1800-2500 calories	58.1
6.	The type of diet fibre that helps the blood cholesterol level drop	Fibre soluble in water	28.5
7.	The main fatty acid type in olive oil	Mono-unsaturated	38.8
8.	The nutrient preventive against hyper blood pressure	Potassium (K^+)	78.8
9.	The factor that increases the HDL-cholesterol level in blood	Alcohol	13.1
10.	The proportion of the daily total energy that comes from fats	25-30%	56.9
11.	The food type that is the best source of vitamin B_{12}	Meat	43.8
12.	The type of food that is believed to have a preventive effect on various cancer types	Fruits and vegetables	90.0
13.	The energy released by one gram of carbohydrate	Four calories	40.8
14.	The nutrient which is not an antioxidant	Iron (Fe)	61.5
15.	The nutrient effective in the prevention of Neural Tube Defect	Folic acid	54.6
16.	The type of food rich in lykopene	Tomatoes	56.2
17.	The type of food whose glycemic index is the lowest	Ice cream	17.3
18.	The main fatty acid in the egg	Mono-unsaturated fatty acid	20.8
19.	The body weight of an adult whose BMI is 25.0-29.9kg/m^2	Overweight	51.2
20.	The best way of losing weight	Increasing physical activity and decreasing food intake	97.7

[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 nurses according to explanatory variables

	Good		Adequate		Inadequate		
Variables	n	(%)	n	(%)	n	(%)	Statistics
Age (years)							
≤25	11	21.6	29	56.8	11	21.6	$X^2 = 12.561$
26-30	27	30.0	56	62.2	7	7.8	df = 6
31-35	26	41.3	33	52.4	4	6.3	p>0.05
≥36	21	37.5	30	53.6	5	8.9	
Education							
Secondary education	12	15.2	52	65.8	15	19.0	$X^2 = 20.997$
Undergraduate	59	39.3	80	53.4	11	7.3	df = 4
Graduate	14	45.2	16	51.6	1	7.7	p <0.001
Length of working experience (years)							
≤5	13	21.0	35	56.4	14	22.6	$X^2 = 27.604$
6-10	21	25.0	59	70.2	4	4.8	df = 6
11-15	28	50.9	23	41.8	4	7.3	p <0.001
≥16	23	39.0	31	52.5	5	8.5	
Total	85	32.7	148	56.9	27	10.4	

Table 5: The average scores of the nutrition knowledge level of the nurses according to explanatory variables

Variables	n	X±S*	F	p
Age (years)				
≤25	51	10.50 ± 2.50^{a}	4.64	p<0.01
26-30	90	11.32 ± 1.84^{ab}		
31-35	63	11.95 ± 2.14^{b}		
≥36	56	11.58 ± 2.10^{ab}		
Education				
Secondary education	79	10.69 ± 2.51^{a}	15.14	p<0.001
Undergraduate	150	11.74 ± 1.75^{b}		
Graduate	31	12.22 ± 1.89^{b}		
Length of working experience (years)				
≤5	62	10.45 ± 2.45^{a}	7.80	p<0.001
6-10	84	11.25 ± 1.63^{ab}		
11-15	55	12.21 ± 2.11^{b}		
≥16	59	11.73 ± 2.16^{b}		

* The difference between the averages shown with the different letter is significant

given nutrition training by a dietician. After the training, 88% of the nurses were reported to have a good or excellent level of confidence compared with 27% before the training. This emphasizes the importance of nutrition training.

The nutrition knowledge levels of the nurses according to explanatory variables are shown in Table 4.

It was determined that the highest rates of good nutrition knowledge level are in the following groups: In the age 31-35 age group (41.3%), among those with graduate degrees (45.2%) and in the group with a working experience of 11-15 years (50.9%). It was found that the state of change of the nutrition knowledge level with respect to educational status and length of working experience is statistically significant ($p< 0.001$).

According to the explanatory variables, the average scores of nutrition knowledge level and the variance analysis results are presented in Table 5.

The average score of the nutrition knowledge level of the nurses is 11.37±2.15 in general (minimum 5-maximum 16 points). According to this result, the average rate of correct responses is 56.75%±10.84. This result compares to the research results of Crogan *et al.* (2001) and Schaller and James (2005) (65 and 60.2%, respectively).

It has been determined that the differences between the average nutrition knowledge scores of the participants as per their age group ($p<0.01$), educational status ($p<0.001$) and length of experience ($p<0.001$) are statistically significant. When the age group is considered, the nutrition knowledge score differences between those 25 years old or younger and those between 31 and 35 are significant ($p < 0.05$).

The nutrition knowledge scores of the secondary school graduates are different from the scores of those with undergraduate and graduate degrees ($p<0.05$). The differences between the nutrition knowledge level of those who have worked as a nurse for 5 years or less, for 11 to 15 years and 16 years or more are statistically significant ($p<0.05$).

Schaller and James (2005) have established that the nutrition knowledge scores of the nurses with a professional experience of more than 10 years are significantly higher than those of the nurses with a working experience of 10 years or less. This result is in line with our findings.

CONCLUSION

The nurses who are employed in the health sector have important duties on these subjects. In the education of nurses, courses containing various nutrition topics should also be included in the curricula. There are departments of nursing in high schools and universities in Turkey. The nurses who graduate from these departments get one or two courses on nutrition.

In this study, it was determined that the nutrition knowledge level of more than half of the nurses was

adequate. Still, there were not any nurses whose nutrition knowledge was at a "very good" level. The average scores of the nutrition knowledge level of the nurses with graduate degrees were found to be higher than those of undergraduates and secondary school graduates. It is believed that increasing the number of courses on nutrition during their education period and providing in-service training at certain intervals after graduation will be beneficial to increase the nutrition knowledge level of nurses.

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