

The nutrition knowledge level of physicians, nurses and nutritionists in some educational hospitals

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ABSTRACT

Nutritional care is an important part of medical care of patients and plays a key role in improvement, prevention and control of malnutrition in hospitals. The current study aimed to determine the nutrition knowledge level of doctors, nurses and nutritionists in some teaching hospitals in Tehran in 2008. In a cross-sectional study a total of 198 samples including 28 nutritionists, 81 nurses and 89 physicians were selected using simple random sampling. The current study was conducted in 9 hospitals affiliated with the Shahid Beheshti University of Medical Sciences (SBMU) in Tehran. A self-administered multiple choice questionnaire about different aspects of basic and clinical nutrition was completed. Then nutrition knowledge levels of each individual was determined by calculating correct knowledge, perceived knowledge and accuracy of knowledge scores. The median knowledge score of the nutritionists, physicians, and nurses was 85%, 77%, and 75%, respectively. The median perceived knowledge of all the groups was above 90%. The mean accuracy score in the 3 groups of nutritionists, physicians and nurses was 87%, 79%, and 76%, respectively. The results indicated that all groups have a poor knowledge, especially in clinical nutrition topics. Based on the current results, knowledge level of clinical staff is an effective factor in not paying attention to the importance of nutritional care as a part of medical care of the patients. Enhancing awareness level of all groups especially physicians and nutritionists in clinical division plays an important role in enhancing clinical nutrition care and treatment regime.

Keywords: Nutrition; Knowledge; Physicians; Nurses; Nutritionists; Hospital

INTRODUCTION

Optimal nutritional care plays a key role in the improvement of the patient's condition and decreasing hospitalization. Several studies in different countries have indicated that based on hospital division and the index used for calculation of malnutrition, the risk for malnutrition in hospitalized patients varies between 6% to 55% [1]. There are a limited number of studies performed on this subject in Iran. In a recent study on hospitalized patients in Shariati Hospital in Tehran, the prevalence of malnutrition was estimated 6% [2]. Nutritional

care is an important part of medical management of patients and plays a key role in improvement, prevention and control of malnutrition in hospitals. Insufficient knowledge among doctors and nurses has been one of the major barriers of adequate nutritional care often seen in different hospital settings [3]. Nurses do not achieve appropriate nutritional education and because of insufficient knowledge and skills cannot play an effective role in patient's nutrition management. Physicians who are considered to be the main reliable source of nutrition information and

education for many patients do not pay attention to nutrition-related problems of the patients, due to inadequate nutritional knowledge [4]. The Council of Europe in a report on clinical nutrition and patients' nutritional care in hospitals revealed that insufficient education and knowledge about nutrition among all staff groups involved in nutritional services, and those at the management level was the second major barrier for proper nutritional care of the patients [5]. In a study on 4512 physicians and nurses in three countries (Denmark, Sweden and Norway), lack of nutritional knowledge among these groups was the major reason of poor nutritional services [6]. In another study on nutritional knowledge and attitude in comparison to their nutritional practices of 6000 doctors and 6000 nurses in Scandinavia, those with better nutrition knowledge provided patients with better care and more appropriate nutrition services. The study affirms the necessity of enhancing nutritional knowledge in the curriculum of the medical universities and during clinical practices for both doctors and nurses [3]. Of the few studies on doctors' nutrition knowledge, low scores were reported in most of them. Mean knowledge scores of physicians and medical students in Canada, America, Taiwan, Saudi Arabia, and Turkey have been reported as 50%, 49%, 59%, 52% and 48%, respectively [4,7-10]. Results of two recently surveys of physicians and medical students in Iran also indicated that nutrition knowledge is inadequate [11,12]. Knowledge level of doctors and medical students of Qazvin and Azad University of Medical Sciences (2001) was reported to be average The mean score of interns and residents of Shahid Beheshti University of Medical Sciences (SBMU) was 50% (2006) [12]. Low knowledge scores have also been reported for nurses. The mean knowledge score of nurses caring for the elderly in a study conducted in 2001 was 65% [13]. In another report, the mean knowledge score of Australian nurses was 60.2% [14].

There are limited numbers of studies on evaluation of nutrition knowledge of physicians, nurses and nutritionists around the world and few studies have been conducted in Iran. Reports suggest insufficient nutrition knowledge of physicians. Considering the importance of

nutritional care and the role of nutrition knowledge of clinical staff (physicians, nurses and nutritionists) in improvement of patients' quality of life, the current study is the first study aimed to determine the nutrition knowledge level of physicians, nurses and nutritionists in some educational hospitals affiliated with the Shahid Beheshti University of Medical Sciences in 2008, in Tehran.

MATERIAL AND METHODS

This cross-sectional study was conducted using observation method and a self-administered multiple choice questionnaire. A total of 198 samples from all educational hospitals affiliated with the SBMU (9 hospitals), including clinical staff (81 nurses, 89 physicians) and all the nutritionists (28 people) were selected using simple random sampling. The nutrition knowledge level of doctors and nutritionists was determined using the same questionnaire. The questionnaire consisted of 84 questions and included two sections: essential nutrition (general) and clinical nutrition. A questionnaire consisting of 59 multiple-choice questions was used to assess the nutrition knowledge of nurses. The questions were adapted from similar researches and valid scientific contents [15]. The content reliability, face validity and content validity of the questionnaire was then assessed by a panel of knowledgeable and experienced specialists in National Nutrition and Food Technology Research Institute for an acceptable accuracy. The Format of the questionnaire was similar to common exams that clinical staff and nutritionists deal with them. The questionnaire covered two major topics; essential nutrition and clinical nutrition. The questions were arranged in 9 different subject groups as follow; fiber, salt, calcium, protein, saturated fat, general clinical nutrition and clinical nutrition in gastrointestinal diseases, cardiovascular diseases, diabetes, obesity, and cancers. The questionnaires were given to the doctors, nurses and nutritionists of the hospitals to mark their answers. The questionnaires were collected at the end of the working day.

The calculation of nutrition knowledge and awareness scores were calculated giving one point for each correct answer. The maximum score for

doctors and nutritionists was 83 and for nurses was 59. The subjects were given the option of answering with “don’t know” as an additional alternative answer to each of the questions. One question from the questionnaire of doctors and nutritionists was eliminated from the results as it was ambiguous. In this study, 3 aspects of knowledge including: correct knowledge, perceived knowledge and accuracy of knowledge were calculated and determined [15]. The level of correct knowledge was obtained by dividing the number of correct responses by the total number of questions and reported as the percentage of correct knowledge [16]. Correct knowledge score is the easiest way to determine the knowledge level of the participants. Because in this study, “do not know” was an option, therefore it was possible to calculate the perceived knowledge level. If the subject marked “do not know” he admitted that he had no knowledge of the question or had considerable uncertainty about the correct answer. Perceived knowledge was calculated as the number of answered “yes/no” questions marked divided by total number of questions.

Conversely, if the subject marked any of the other answers he must have believed that he had that knowledge. Choosing an answer or having an idea about a question is no guarantee for the knowledge of the person. Hence, to calculate the accuracy of knowledge, number of correct responses was divided by the number of answered “yes/no” questions. After gathering all the questionnaires and coding them, the collected data was entered to computer using MS Access. Statistical analysis was performed using SPSS.Ver.16 [17]. Result were expressed as number and percentage, median, mean and standard deviation depending on the variable type.

RESULTS

A total of 198 questionnaires were completed. Two groups of physicians participated in the study: the faculty members 19.1% (17 subjects) and resident assistants 74.2% (66 subjects). Six participants (6.7%) did not mention if they were a faculty member or an assistant.

Table 1: Distribution of scores (%) of the 3 aspects of knowledge of physician, nurse and nutritionist in the studied hospitals

Group	Index	Correct knowledge	Perceived knowledge	Accuracy of knowledge
Physician (n=89)				
	Median	77	99	80
	Mean	74	94	79
	Standard deviation	11.7	12.7	6.6
	Minimum	14	25	57
	Maximum	88	100	95
Nutritionist (n=28)				
	Median	85	98	88
	Mean	84	95	87
	Standard deviation	7.9	4.5	5.8
	Minimum	61	84	71
	Maximum	94	100	94
Nurse (n=81)				
	Median	75	98	75
	Mean	73	96	76
	Standard deviation	12.0	6.0	10.7
	Minimum	34	64	47
	Maximum	98	100	98

Table 1 shows the median and mean knowledge scores (in percent) of physicians, nutritionists and nurses. The median and mean correct knowledge score for physicians, nutritionists and nurses were (77,74%), (85,84%) and (75,73%), respectively. In all of the 3 groups median scores were higher than mean scores. Nutritionists achieved the highest scores. Comparison of the minimum and maximum scores in each group showed that physicians' gained the minimum score (14%). It should be mentioned that none of the participants answered all the questions correctly and 100% score was not reported.

Based on the results of the current study, the mean perceived knowledge score for all three groups were $\geq 94\%$ and median scores were 98 to 99%. Variations in perceived knowledge scores were highest among the physicians (range: 25-100%). Therefore, all the participants in the study had a certain attitude towards 94-96% of the questions and believed that they had the knowledge. However, reported accuracy of knowledge was not satisfactory. For physicians mean accuracy was 79% with a range of 57 to 95%. The score were slightly lower for nurses 76% (range: 47 to 98%). Among the nutritionists the mean accuracy level was the highest (87%) and the minimum score reported was significantly greater than the other two groups. Accuracy score of 100% was not reported in any of the groups.

Results indicated that 10 to 20% of the perceived knowledge was incorrect. Physicians and nurses do not have correct nutrition knowledge on one quarter of the questions. The overall levels of perceived knowledge for each group have been shown in Fig 1. The Fig 1 shows the number of answered "yes/no" questions (perceived knowledge) in different groups. Physicians answered at least 21 questions and nutritionists

answered at least 70 questions out of 83 questions. Nurses answered 38 questions out of 59. The Fig 2 shows accuracy of knowledge in different groups. The lowest accuracy of knowledge in physicians was 60 to 70%. As shown in the plot1,2, the perceived knowledge is high in physicians, but the percentage of accuracy was lower.

Nutritionists had the highest percentage of answered questions (Fig 2). Results indicated that physicians and nutritionists' knowledge on clinical nutrition topics in comparison to basic nutrition was lower. Questions on the topics of "clinical nutrition in gastrointestinal and kidney diseases" and also "cancer-related clinical nutrition" had the lowest correct knowledge scores and lowest accuracy of perceived knowledge among nutritionists and physicians, respectively.

In tables 2 and 3 groups of questions with the highest incorrect answers among physicians, nutritionists and nurses have been shown. "Consumption of low concentration liquids in patients with swallowing problems" and "the relationship between oxalate calcium kidney stones and calcium intake" were the two questions with the highest incorrect answers among physicians and nutritionists. "The kind of fat with one unsaturated bound" was the only common question with one of the highest incorrect answers among nurses and physicians.

The nutrition knowledge level of physicians, nutritionists and nurses were shown in table 4. More than half of the nutritionists (57%) had a very good nutrition knowledge. Nutrition knowledge of about 70% of physicians was within average (68-76%) to good (76-83%) and only 12% had a very good ($>83\%$) knowledge. Nutrition knowledge of one third of nurses was scored weak.

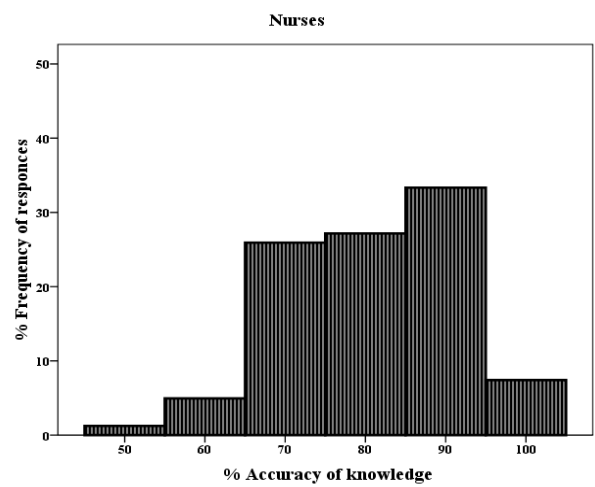
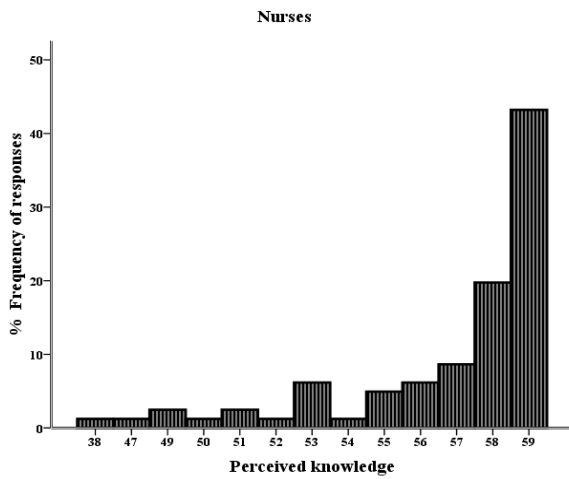
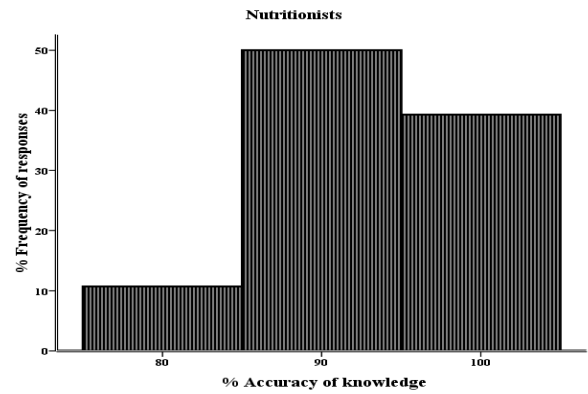
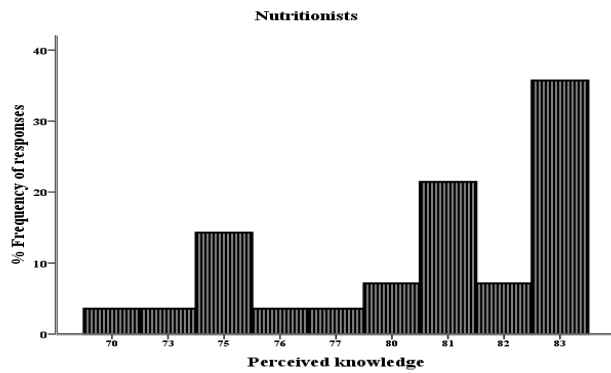
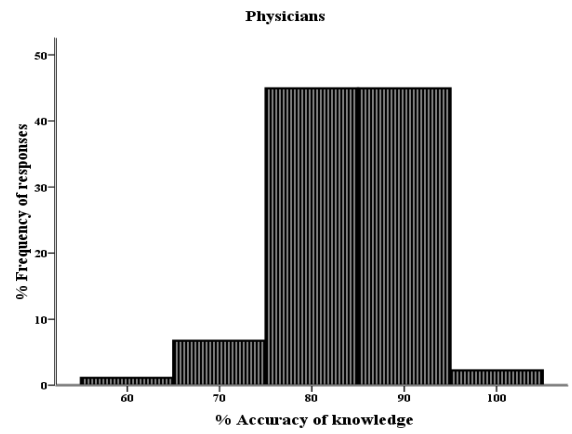
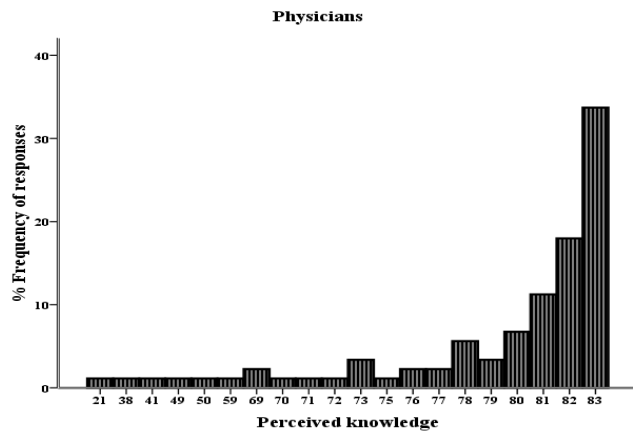


Figure 1: Perceived knowledge level among physicians, nutritionists, nurses in the studied hospitals

Figure 2: Accuracy of knowledge among physicians, nutritionists, nurses nutritionists in the studied hospitals

Table 2: The questions with the highest incorrect answers (wrong answers) by physicians and nutritionists in the studied hospitals

Degree	Physicians	Percentage	Number	Nutritionists	Percentage	Number
1	A type of oil having fat or one unsaturated bound	58.4	52	In patients with swallowing problems, diluted liquids like filtered fruit juice are the best food to swallow	67.9	19
2	In patients with swallowing problems, diluted liquids like filtered fruit juice are the best food to swallow	57.3	51	Those with calcium oxalate kidney stone should restrict their calcium intake	57.1	16
3	Those with calcium oxalate kidney stone should restrict their calcium intake	56.2	50	What do you think of the amount of fat in pasteurized milk?	53.6	15
				As the day passes, cancer patients gain a better appetite	53.6	15
4	Restricting the consumption of saturated fat and cholesterol is the only effective diet that possibly decreases the risk of cardiovascular diseases	53.6	48	What do you think of the amount of salt in red meat?	50.0	14
				For the end-stage kidney patients, fats are the most risky food	50.0	14
5	Those under dialysis need more protein than advised rate for normal people	50.6	45	Those with kidney failure may consume half of the protein advised for normal people	46.4	13

Table 3: The questions with the highest incorrect answers (wrong answers) by nurses in the studied hospitals

Degree	Nurse	Percentage	Number
1	A type of oil having fat or one unsaturated bound	60.5	49
2	What do you think of the amount of fibers in nuts Carbonated drinks (like different kinds of cokes) can cause diarrhea	56.8 56.8	46 46
3	If we have to advice a method of losing weight for overweight or obese people in a short time, decreasing the calorie consumption is more effective than increasing the physical activity	53.1	43
4	Which of these foods have higher unsaturated fat? With the same weight, which of these foods have higher calorie?	48.1 48.1	39 39
5	What do you think of the amount of fat in cheese? What do you think of saturated fats in chocolate? Some foods have high fat but no cholesterol	43.2 43.2 43.2	35 35 35

Table 4: Correct knowledge level (%) of physicians, nutritionists and nurses in the studied hospitals

Specialty	Weak (<% 68)	Average (%68-76)	Good (%76-83)	Very good (>%83)
	Number (Percentage)	Number (Percentage)	Number (Percentage)	Number (Percentage)
Physicians (n=89)	17(19.1)	27(30.3)	34(38.2)	11(12.4)
Nutritionists (n=28)	2(7.1)	2(7.1)	8(28.6)	16(57.1)
Nurses (n=81)	26(32.1)	20(24.7)	18(22.2)	17(21.0)

DISCUSSION

This study reports the nutrition knowledge of nutritionists, physicians and nurses in 9 training hospitals affiliated with the SBMU in Tehran. The levels of correct and perceived knowledge and the accuracy of knowledge were determined for each individual. Nutrition knowledge scores and accuracy of knowledge were highest among nutritionists. But physicians achieved the highest median scores for perceived knowledge (99% versus 98%). Mean scores of correct nutrition knowledge among nutritionists, physicians and nurses were 84, 74 and 73%, respectively. Based on the results physicians have not answered correctly to almost a quarter of the questions and the nutritionists could either not answer 15% of the questions correctly or gave incorrect answers (12 questions out of 83). Considering that nutrition is an important part of medical treatment and in patients care, the results revealed that clinical staff in these teaching hospitals did not have enough nutrition knowledge to meet the demands of their work. The majority of failure in nutritional care has been linked to a lack of appropriate and sufficient nutritional knowledge among clinical staff. A number of studies have shown that increased nutritional knowledge seems to improve the nutritional practice [3]. There are a limited number of studies on knowledge level of clinical health staff worldwide. In a recently research carried out by Kalantari (2006) among interns and residents of SBMU, the mean nutrition knowledge scores were reported 50%, which is significantly lower than the scores in our study [12]. This may mean that doctors gain knowledge through experience and practice. In a previous study mean scores of nutritional knowledge of

physicians (72%) were similar to our findings [11].

The highest scores gained by physicians in this study were similar to the results of other studies showing that age, work experience and specialty are among the important factors that improve a physician's nutritional knowledge [5].

Studies on the nutrition knowledge level of nurses are mostly performed in the USA and Australia. In 3 studies on rural nurses (1990), elderly nurses (1994), and graduated nurses (1997) the mean nutrition knowledge score was 65%. Among Australian nurses, older ones and those with more years of experience scored higher average knowledge [14]. The mean nutrition knowledge of 129 graduated nurses at different levels (nursing assistant, nurses with diploma, and those with bachelor of nursing) scored 60% [18]. In another study, the nutritional knowledge level of 99 South African clinical nurses by answering a 40 item multiple questionnaire indicated that their knowledge was poor [19]. Insufficient knowledge of nurses has been proven by the results of previous studies [18,20,21]. Despite the higher scores gained by nurses in our study, results indicated a lack of sufficient nutrition knowledge among SBMU nurses.

Nurses are in constant contact with patients and can communicate the patients' problems to the rest of the medical team. Nurses constantly receive nutrition request and give nutrition advice in a study, 91% of nurses reported that patients constantly ask their nutrition questions from them and have nutrition-related requests [18]. The mean knowledge score in the majority of studies supports the data that nurses at different levels have insufficient nutrition knowledge. Nutrition knowledge level of nurses with a bachelor and

those with nursing diploma is low. More education in nutrition and improvement of nutrition knowledge of nurses was emphasized by Cadman in 1998 [20], and Warber in 2000 [21].

The nutritionist or the dietitian is the most reliable person to provide nutritional advice and support in the clinical team. In the present study nutritional knowledge level of nutritionists were significantly higher than physicians and nurses ($P < 0.005$). This finding was similar to other surveys [22,23]. Findings of table 1 indicate that nutritionist could not answer 15% of questions correctly.

We also found that nutrition knowledge of 14% of nutritionists was poor and average and near 60% had a very good knowledge. Nutrition knowledge of approximately half of the physicians and nurses were categorized as poor to average.

Results of tables 2 and 3 demonstrated areas of poor knowledge among hospital doctors, nurses and nutritionist. In other studies it was also found that the clinical staff's fundamental nutritional knowledge was better than their clinical knowledge [24]. Insufficient knowledge with regard to clinical nutrition among physicians and nurses was said by Council of Europe-Committee of Ministers (ECCEN) to be another major barrier to proper nutritional care in hospitals [25].

Among health professionals the accuracy of knowledge must also be considered. The fact that a person has an opinion on a subject is no guarantee that the opinion is accurate. Such accuracy is obviously important because patients receive and accept the advice from a doctor, nurse or nutritionist. We have therefore assessed the levels of accuracy of the nutritional knowledge of the clinical professionals. We have found high levels of perceived knowledge; 98 to 99% but the accuracy of knowledge was not reassuring. The lower levels of accuracy, 57 and 47% among physicians and nurses, respectively, and 71% reported among nutritionists do not inspire confidence in the nutritional advice given by them.

Among the published studies of nutritional knowledge, a few have presented their data in a way which permits calculation of perceived knowledge and accuracy. In the study by Dugdale et al. the mean perceived knowledge and accuracy

levels of knowledge was reported 95% and 79% for physicians, 89% and 70% for medicine students, 95% and 79% for nurses, which are similar to our findings [26]. A group of registered nurses' who were asked about food composition and the rationale of therapeutic diets had perceived knowledge in the range of 86-94% and accuracy of knowledge in the range of 76-93%, respectively [27]. Conversely in another study, correlations between perceived and actual knowledge scores showed weak associations for general physicians, dietitians and dietetic students, and a weak positive correlation was showed among nursing and medical students, indicating that their perceived knowledge is reflective of their actual correct knowledge on nutrition.

CONCUSION

Physicians, nurses and nutritionists are the persons responsible for nutritional care of patients in hospitals. They do receive nutrition requests and do give nutrition advice to patients. Our findings indicated that the nutritional knowledge levels of physicians, nutritionists and nurses of SBMU, especially in the field of clinical nutrition, is not satisfactory. Increased nutrition knowledge seems to improve nutrition practice. To improve nutritional care in hospitals effective nutrition training and continuing education for all staff involved in nutritional care of patients has to be addressed as a priority.

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