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## Nutrition Knowledge of Primary Care Physicians in Saudi Arabia

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**Abstract:** Several studies have indicated a lack of nutritional knowledge among physicians. As there is no published data in nutritional knowledge among physicians in Saudi Arabia, hence the purpose of this current study was to assess the nutrition knowledge of primary care physicians working in Riyadh, Saudi Arabia. Nutrition knowledge questionnaire consisted of 16 multiple-choice questions, was mailed to 105 primary care physicians working in Riyadh, Saudi Arabia. The questionnaire was pre- tested in a pilot study. Non-respondents received a second questionnaire and a phone call. Of the 105 primary care physicians, 59 replies were received (56.2%). The mean mark for correctly answered questions was 51.7%. Approximately 75 % of the physicians described their knowledge of nutrition as "Poor". The results indicate that physicians are generally aware of information which has been publicized in the medical press: nutrient which helps prevent thrombosis (omega-3 fat); the preventive action of fruit and vegetables against cancer; which nutrients are antioxidants; the nutrient associated with the prevention of neural tube defects (folate). By contrast they have a poor knowledge of other important topics in nutrition: the major type of fat in olive oil; hydrogenated fats; source of vitamin B<sub>12</sub>; Substance raises the blood HDL-cholesterol level (Alcohol); the association between excess protein intake and calcium loss; the type of dietary fiber helpful in lowering the blood cholesterol level (soluble fiber) and Nutrient is protective against hypertension. These results support other data that physicians need more education in nutrition. Nutrition should be an essential part in continuing medical education.

**Key words:** Physician, nutrition knowledge, Saudi Arabia

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### Introduction

A study revealed a long history in lack of nutritional knowledge among physicians (Krause and Fox, 1997). Several studies have indicated relatively less knowledge of nutrition in students and educators within the medical education causing much mortality in the United States (Schulman, 1999; Temple, 1994).

In 1992 - 1993 a survey revealed that only twenty five percent of the United State of America (USA) and Canadian medical education has a required course of nutrition (Feldman, 1995). Moreover, a decline in the number of USA medical schools offering required nutrition courses from 46 in 1982 to 27 in 1995 was observed (Feldman, 1995). However, information concerning nutritional knowledge among practicing physicians was much less.

At Southampton University, England a survey of physicians revealed that most of the physicians rated their nutrition knowledge as "poor" or "very poor" (Heywood and Wootton, 1992). Similar studies with physicians working in Alberta, Canada revealed that 42% described their knowledge in nutrition as weak (Temple, 1999).

In other survey to assess perceived knowledge of nutrition of family practice, only 7% rated their nutritional knowledge as excellent (Lasswell *et al.*, 1984). Surveys carried out in 1980's among physicians of Miami and

Missouri States indicated that they seriously underestimated the importance of diet, which resulted in causing cancer (Schapira and Pozo, 1986; Brownson *et al.*, 1993).

In other tests of nutrition knowledge, a 1989 study of physicians in California (Mlodinow and Barrett-Connor, 1989) and a 1999 study of physicians in Canada (Temple, 1999) reported a correct response rate of 69.2% and 63% respectively. While a test of primary care physicians in Taiwan (Hu *et al.*, 1997) and family practice residents in Texas (Kirby *et al.*, 1995) gave a score of 59% and 50.7% respectively.

A survey of physicians in USA revealed that many more physicians would give dietary counseling to their patients except for some problems (Kushner, 1995). Lack of nutrition knowledge among 62% was noted as one of the major hurdle among physicians. Other major barriers include inadequate counseling skills, lack of time and poor patient compliance.

As there is no published data in nutritional knowledge among physicians in Saudi Arabia, hence the purpose of this current study was to assess the nutrition knowledge of primary care physicians working in Riyadh, Saudi Arabia.

### Materials and Methods

A list of 105 primary care physicians working in four

Table 1: Nutrition Knowledge Questionnaire

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|---|---|
| <ol style="list-style-type: none"> <li>1. What type of dietary fiber is helpful in lowering the blood cholesterol level?             <ol style="list-style-type: none"> <li>a. Soluble fiber.*</li> <li>b. Insoluble fiber.</li> <li>c. Cellulose.</li> </ol> </li> <li>2. Excess of which nutrient may increase body calcium loss:             <ol style="list-style-type: none"> <li>a. Protein.*</li> <li>b. Saturated fat.</li> <li>c. Sugar.</li> </ol> </li> <li>3. A nutrient believed to help prevent thrombosis is:             <ol style="list-style-type: none"> <li>a. Omega-3 fat.*</li> <li>b. Monounsaturated fat.</li> <li>c. Vitamin C.</li> </ol> </li> <li>4. The adequate intake level of calcium for adult aged 51-70 years is:             <ol style="list-style-type: none"> <li>a. 500 milligrams/day.</li> <li>b. 1200 milligrams/day.*</li> <li>c. 2000 milligrams/day.</li> </ol> </li> <li>5. The major type of fat in olive oil is:             <ol style="list-style-type: none"> <li>a. Saturated fat.</li> <li>b. Polyunsaturated fat.</li> <li>c. Monounsaturated fat.*</li> </ol> </li> <li>6. Compared with unprocessed vegetable oil, hydrogenated fats contain:             <ol style="list-style-type: none"> <li>a. More polyunsaturated fat.</li> <li>b. More trans fats.*</li> <li>c. More cholesterol.</li> </ol> </li> <li>7. Which nutrient is protective against hypertension?             <ol style="list-style-type: none"> <li>a. Potassium.*</li> <li>b. Chlorine.</li> <li>c. Iron.</li> </ol> </li> <li>8. Which vitamin is likely to be toxic if consumed in excess amount for long period of time?             <ol style="list-style-type: none"> <li>a. Vitamin C.</li> <li>b. Vitamin A.*</li> <li>c. Vitamin D.</li> </ol> </li> <li>9. The most concentrated source of vitamin B<sub>12</sub> is:             <ol style="list-style-type: none"> <li>a. Fruit.</li> <li>b. Whole grain cereals.</li> <li>c. Meat.*</li> </ol> </li> <li>10. Which substance raises the blood HDL-cholesterol level?             <ol style="list-style-type: none"> <li>a. Animal protein.</li> <li>b. Riboflavin.</li> <li>c. Alcohol.*</li> </ol> </li> <li>11. In general, dietary recommendations are intended to:             <ol style="list-style-type: none"> <li>a. Maximize food efficiency.</li> <li>b. Maintain public health.*</li> <li>c. Increase athletic performance.</li> </ol> </li> <li>12. Type of food believes to have a preventive effect on various types of cancer is:             <ol style="list-style-type: none"> <li>a. Fruit and vegetable.*</li> </ol> </li> </ol> | <ol style="list-style-type: none"> <li>b. Milk.</li> <li>c. None of the above.</li> <li>13. The number of kilocalories in one gram of fat is:             <ol style="list-style-type: none"> <li>a. 4</li> <li>b. 7</li> <li>c. 9 *</li> </ol> </li> <li>14. Which of the following is not an antioxidant nutrient?             <ol style="list-style-type: none"> <li>a. Vitamin E.</li> <li>b. Beta-carotene.</li> <li>c. Zinc.*</li> </ol> </li> <li>15. The nutrient strongly associated with the prevention of neural tube defects is:             <ol style="list-style-type: none"> <li>a. Beta-carotene.</li> <li>b. Folate.*</li> <li>c. Vitamin C.</li> </ol> </li> <li>16. Short-term (diet) plans are usually successful at achieving weight loss because they:             <ol style="list-style-type: none"> <li>a. Decrease appetite.</li> <li>b. Cause the body to lose water.*</li> <li>c. Burn large amount of stored fat.</li> </ol> </li> </ol> |
|---|---|

\* Indicate the correct answer.

government hospitals, not related to Ministry of Health was prepared, which was provided by each hospital. A Nutrition knowledge questionnaire was adopted and modified from (Temple, 1999). The questionnaire consisted of 16 multiple-choice questions, each with three possible answers. The 16 questions on which the results are based are given in Table 1. One question was asked to determine how the physicians rate their nutrition knowledge with 3 possible choices i.e. (Poor, Moderate, and Excellent). The questionnaire was pre- tested in a pilot study before sending it to the physicians. The questionnaire was sent to physicians together with a personalized cover letter and a consent form. If no reply was received after two weeks, the questionnaire was sent again followed by a phone call asking the questionnaire to be completed.

**Statistical methods:** Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 11.0-computer software. Descriptive statistics were used to display data in frequencies, percentages and mean. Percentages have been rounded-off to the nearest value.

**Results**

Of the 105 primary care physicians, 59 replies were received (56.2%). Table 2 shows the simplified form of questions asked together with the correct percentage of answers. The mean mark for correctly answered questions was 51.7% (SD +14.35). Two third of primary care physicians scored between 40% and 69%. Approximately 75% of the physicians described their knowledge of nutrition as “Poor” and rest of the physicians as “Moderate”.

Table 2: Questions Asked, Correct Answers and Percentage of Physicians with Correct Answer

No.	Question	Correct Answer	% Correct
1.	Dietary fiber helpful in lowering blood cholesterol level	Soluble fiber	32%
2.	Excess of which nutrient may increase body calcium loss	Protein	32%
3.	Nutrient believed to help prevent thrombosis	Omega-3 fat	71%
4.	Adequate intake level of Calcium for adult aged 51-70	1200 milligrams/day	35%
5.	Major type of fat in olive oil	Monounsaturated fat	47%
6.	Hydrogenated fats contain	More trans fats	49%
7.	Nutrient is protective against hypertension	Potassium	45%
8.	Vitamin likely to be toxic if consumed in excess amount	Vitamin A	44%
9.	Most concentrated source of vitamin B <sub>12</sub>	Meat	50%
10.	Substance raises the blood HDL-cholesterol level	Alcohol	45%
11.	In general, dietary recommendations are intended to	Maintain Public health	44%
12.	Foods have preventive effect on various types of cancer	Fruits & Vegetables	61%
13.	Number of kilocalories in one gram of fat	9	61%
14.	Nutrient in not an antioxidant	Zinc	66%
15.	Nutrient associated with prevention of neural tube defects	Folate	79%
16.	"diet" plans are usually successful at achieving weight loss	Cause the body to lose water	59%

\*.The percentages have been rounded-off to the nearest value.

\*.See Table.1 for full and detailed questions with three multiple-choice answers.

## Discussion

The response rate in this current study (56.2%) was higher than what were reported by Flynn *et al.*, 2003 (16%) whereas a study of nutrition knowledge among primary care physicians in Taiwan was attributed 27% (Hu *et al.*, 1997). In Another survey of nutrition knowledge of physicians carried by Temple (1999) in Canada and Mlodinow and Barrett-Connor (1989) the response rate was observed 36% and 40% respectively. Seventy-five percent of the physicians in this present study rated their nutrition knowledge as poor. This could be one of the reasons for the higher response rate as physicians might be more curious to know how their nutrition knowledge was.

Nevertheless, much caution is necessary before generalizing these results beyond our study population of physicians working in primary care, in Saudi Arabia.

The mean score for correctly answered questions in this current study (51.7%) was lower than what was achieved in the survey of Nutrition knowledge of physicians in Canada ( 63% ) ( Temple, 1999 ) and was relatively similar to the score of (50.7%) which was reported by Kirby *et al.*, (1995) in a study on family practice residents in Texas.

Other comparable studies reported in Taiwan (Hu *et al.*, 1997) and in California (Mlodinow and Barrett-Connor, 1989), the mean scores for correctly answered questions were (59%) and (69.2%) respectively, rather better than the score achieved in the present study. However, these questions were true-false indicating that chance would have increased the score far better than was the case here in this study.

The results of the current study in Table 2 indicate that physicians are aware of information publicized in medical press (Notably questions 3, 12, 14 and 15).

This trend was similar to what were reported by Temple (1999) and Mlodinow and Barrett-Connor (1989) in their studies. However, surprisingly a low number of physicians gave the correct answer to questions 1, 2, 7, 8 and 13, and a poor knowledge of other important topics in nutrition (questions 5, 6, 9, 10, 11, and 16) was also found in this study. Other studies are needed to know that physicians have excellent knowledge in these other areas.

Overall results indicate that there are serious gaps in nutrition knowledge among average physicians. Many physicians do not have the expertise to properly advise their patients in particular the role of nutrition in causing, prevention, and therapy of disease (e.g., the role of diet in hypertension, hyper-cholesterolemia, and osteoporosis).

On the whole the evidence from the study clearly indicates that those primary care physicians working in four hospitals need more education in nutrition. Accordingly, nutrition as subject needs to be properly integrated in the curriculum of medical school. Moreover, nutrition should be first and foremost an essential part in continuing medical education, firstly since most physicians in this study lacking necessary nutrition knowledge, and secondly because nutrition as a subject is rapidly evolving.

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