

# Nutritional knowledge of primary health care physicians in Jeddah, Saudi Arabia

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## ABSTRACT

**الأهداف:** أجريت هذه الدراسة لتحديد معرفة أطباء الرعاية الصحية الأولية حول التغذية.

**الطريقة:** تم توزيع استبيان مكون من 16 سؤالاً متعددة الخيارات على 125 طبيباً يعملون في مراكز الرعاية الصحية الأولية - جده - المملكة العربية السعودية، خلال الفترة ما بين مارس 2006م وحتى أغسطس لعام 2006م.

**النتائج:** بناء على الاستبيانات المكتملة والتي وردت من 91 من مجموع 125 طبيباً (72.2%). كان متوسط عدد الإجابات الصحيحة من المجموع الكلي 8.34 من أصل 16 سؤالاً بنسبة (52.1%)، وفترة الثقة عند (95%) بين (52.6-51.6). وصف 74 (81%) من أطباء الرعاية الصحية الأولية معلوماتهم حول التغذية بأنها ضعيفة. وأشارت النتائج أيضاً إلى أن الأطباء عموماً لديهم معلومات في التغذية لبعض الأمراض الشائعة كالمواضيع التي تتعلق بكمية الكالسيوم الكافية للبالغين، تأثير البوتاسيوم في الحماية من ارتفاع ضغط الدم، دور الفاكهة والخضروات في الوقاية من أمراض السرطان، وكذلك معلومات عن نوعية الفيتامينات التي تكون سامة ومضرة إذا أخذت بجرعات مفرطة، إضافة إلى معلومات عن المادة التي تمنع عيوب الأنبوب العصبية، وسجلوا ما بين (70% - 90%). وفي المقابل أظهر الأطباء ضعف المعرفة فيما يخص مواضيع هامة في التغذية مثل: التركيب البايوكيميائي لأنواع مختلفة من الدهون، وغيرها من المواضيع التي كان يفترض أن تعطي خلال التعليم الطبي المستمر مثل دور الألياف الذائبة في خفض مستوى الكوليسترول في الدم، ودور دهون أوميغا 3 في منع تخثر الدم، وكذلك مدى فعالية خطط النظام الغذائي للفترات قصيرة الأجل حيث سجل الأطباء أقل من (60%).

**خاتمة:** تبين النتائج الواردة في هذه الدراسة إن أطباء الرعاية الصحية الأولية بحاجة إلى مزيد من التدريب في مجال التغذية، وإن علم التغذية ينبغي أن يكون جزءاً أساسياً في مناهج كليات الطب والتعليم الطبي المستمر لأطباء الرعاية الصحية الأولية.

**Objectives:** To determine the nutritional knowledge of primary care physicians.

**Methods:** A validated questionnaire with multiple-choice questions was distributed to 125 physicians, working in the Ministry of Health (MOH) primary health care centers in Jeddah, Kingdom of Saudi Arabia, between March and August 2006.

**Results:** Completed questionnaires were received from 91 of 125 physicians (72.8%). The mean number for correctly answered questions was 8.34 out of 16 questions (52.1%). The 95% confidence interval was (51.6-52.6). Physicians who described their nutritional knowledge as "poor" were 74 (81%). The results indicated that physicians are generally aware of nutritional information related to common prevalent topics related to adequate intake level of calcium for adults, the protective effect of potassium in hypertension, the preventive action of fruits and vegetables against cancer, toxic vitamins if consumed excessively, and the nutrients associated with the prevention of neural tube defects, scoring between 70-90%. In contrast, physicians showed poor knowledge regarding other important topics in nutrition, such as biochemical structures of different types of fat, other updated topics that are supposed to be covered during continuing medical education, such as the role of soluble fiber in lowering blood cholesterol level, omega-3 fat in preventing thrombosis, and the effectiveness of short-term diet plans; these scored less than 60%.

**Conclusion:** These results showed that physicians need more training on nutrition. Nutrition should be an essential part in the curriculum of medical schools and continuing medical education for primary health care physicians.

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Historically, physicians were not prepared to assess and treat nutrition problems in their patients. People became more aware of nutrition, demanding reliable sources of nutritional information. The public has formed a negative image towards the knowledge and experience of their physicians toward nutrition. This attitude encourages people to seek nutrition information from potentially unreliable sources.<sup>1</sup> Survey studies revealed that physicians are hesitant to provide nutritional information to patients due to low levels of confidence resulting from a lack of education and knowledge in this field.<sup>2</sup> Interest has emerged in nutrition education, and many medical schools integrated nutrition in bedside and case based teaching have none.<sup>3,4</sup> Primary care physicians have the potential to decrease morbidity and mortality if they provide effective nutrition counseling and advice. Nutrition knowledge changes with new scientific evidence. Physicians must be aware of reliable sources of continuing education and information appropriate for their practice and patients care.<sup>5</sup> Several studies in the United States, Canada, and Asia have indicated a lack of nutritional knowledge among physicians.<sup>6-12</sup> One national study was carried out in Riyadh among primary care physicians in 4 governmental hospitals not belonging to the Ministry of Health (MOH) in 2004. The response rate was 52%, and the mean mark for correctly answered questions was 51.7%. Seventy-five percent of physicians described their knowledge of nutrition as "poor".<sup>13</sup> The objectives of the present study were to assess the nutritional knowledge of primary care physicians, and to determine how physicians rate their nutritional knowledge.

**Methods.** We conducted a cross sectional analytic study of all primary care physicians working in MOH primary health care centers in Jeddah, Saudi Arabia between March and August 2006. Ten physicians were selected as a pilot study, and ethical consideration was taken through written permission from the authority to conduct the research. A questionnaire was distributed to physicians with a personalized covering letter. Confidentiality of data was confirmed, and was distributed and collected by the researcher. The questionnaire was validated, adopted, and modified from Temple<sup>12</sup> and Al-Numair studies.<sup>13</sup> It consists of 16 multiple-choice questions, each with 3 possible answers. The correct answers were scored from 100,

and the mean mark for correctly answered questions was calculated. One question was asked to determine how physicians rate their nutritional knowledge (poor, moderate, excellent). Socio demographic variables were included.

Data were entered and analyzed by the researcher using SPSS software statistical program version 10. Continuous variables were presented as means, standard deviations and categorical variables as frequencies and percentages. Differences were considered significant at  $p < 0.05$ . Confidence interval was used to measure the precision of the results. Independent t-test was used to compare the mean score, and correlation coefficient was used to measure the correlation between nutrition knowledge and age and years of practice. To adjust for potential confounding factors, multiple linear regression analysis was used to identify the factors associated with the knowledge score.

**Results.** Of the 125 primary care physicians working at the time of the study, 91 replies were received with a response rate of 72.8%. The mean age was 34.8 years, standard deviation SD (8.09). There were 59 (65%) females, and 70 (77%) Saudi physicians. Most of the primary care physicians 76 (83.5%) were general practitioners (GPs), followed by Family physicians (board certified), then Pediatricians. Most of the primary care physicians in this study graduated from King Abdulaziz University in Jeddah (60.4%). Clinical practice ranged between 1-28 years with a mean of 8 years, SD (7.86). Most of the study population (79 [87%]) did not receive nutritional education in medical school. Interestingly, no one mentioned that he had previous continuous medical education (CME) in nutrition. For the assessment of nutritional knowledge, the minimum number for correctly answered questions was 3, and the maximum was 14 questions. The mean number for correctly answered questions was 8.34 out of 16 questions with a mean mark of 52.1%, and standard deviation of 2.37. The 95% confidence interval was (51.6-52.6). As shown in Table 1, the results of the current study indicated that physicians are aware of topics related to adequate intake level of calcium for adults, and the protective effect of potassium in hypertension, the preventive action of fruits and vegetables against cancer, the toxic vitamin if consumed excessively, and the nutrient associated with the prevention of neural tube defects, scoring between 70-90%. Physicians showed poor knowledge regarding other important topics in nutrition, like biochemical structures of different types of fat. For other updated topics that are supposed to be given during continuing medical education, like the role of soluble fiber in lowering blood cholesterol level, omega-3 fat in preventing thrombosis, and the

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**Table 1** - The simplified form of questions asked together with the correct percentage of answers.

No.	Question	Correct Answer	Frequency	(%)*
1.	Dietary fiber helpful in lowering blood cholesterol level	Soluble fiber	42	(46)
2.	Excess of which nutrient may increase body calcium loss	Protein	24	(26)
3.	Nutrient believed to help prevent thrombosis	Omega-3 fat	38	(42)
4.	Adequate intake level of calcium for adults aged 51-70	1200 milligrams/day	64	(70)
5.	Major type of fat in olive oil	Monounsaturated fat	46	(51)
6.	Hydrogenated fats contain	More trans fats	20	(22)
7.	Nutrient is protective against hypertension	Potassium	82	(90)
8.	Vitamin likely to be toxic if consumed in excess amounts	Vitamin A	64	(70)
9.	Most concentrated source of vitamin B12	Meat	31	(34)
10.	Substance raises the blood HDL-cholesterol level	Alcohol	25	(28)
11.	In general, dietary recommendations are intended to	Maintain public health	71	(78)
12.	Foods have a preventive effect on various types of cancer	Fruits and vegetables	77	(85)
13.	Number of kilocalories in one gram of fat	9	65	(71)
14.	Nutrient is not an antioxidant	Zinc	54	(59)
15.	Nutrient associated with prevention of neural tube defects	Folate	80	(88)
16.	Short term "diet" plans are usually successful at achieving weight loss	Cause the body to lose water	54	(59)

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

**Table 2** - Relation between nutritional knowledge and nationality.

Nationality	Mean	SD	Mean difference	95% CI	P-value*
Saudi (n=70)	8.7	2.32	1.55	0.42-2.7	0.01
Non-Saudi (n=21)	7.1	2.19			

\* Independent t-test = 2.7, degree of freedom = 89

**Table 3** - Correlation between nutrition knowledge and other factors.

Factor	Correlation coefficient*	P-value
Age	- 0.377	<0.01
Years of practice	- 0.373	<0.01

\*Pearson correlation

effectiveness of short-term diet plans, they scored less than 60%. Seventy-four (81%) physicians described their nutritional knowledge as "poor". Although the female physicians scored more than men, the mean score was 8.61 (SD 2.36) versus 7.84 (SD 2.35) for men. T-test was statistically not significant. The mean score of physicians with previous nutritional education (8.75 [SD 2.49]) was more than those who did not have previous nutritional education (8.27 [SD 2.36]), but it was statistically not significant. Saudi physicians showed better nutritional knowledge than non-Saudi, and t-test was significant at a level of 0.01 (Table 2). Interestingly, age and years of practice significantly inversely correlate with nutritional knowledge (Table 3). Stepwise linear logistic regression was used to determine the predicting factors for nutritional knowledge. It revealed that age was the only significant predictor for

the nutritional knowledge score, as the score decreased with increasing age with standardized beta coefficients (-0.11). Indicating that newly graduated doctors retain better nutritional knowledge, which probably decreases by time if it is not supported and updated by continuing medical education.

**Discussion.** The response rate in the current study was 72.8%, which ranks it as the highest among other studies in the same field; the response rate was 56.2% in Al-Numair's study.<sup>13</sup> Also, it is higher than that reported by Flynn (16%).<sup>14</sup> In another survey of nutrition knowledge of physicians carried out in Canada, the response rate was 36%,<sup>12</sup> a study in California showed the response rate of 40%,<sup>8</sup> and a study in Taiwan showed a response rate of 27%.<sup>10</sup> The high response rate in this study is due to self recollection of the questionnaires by the researcher. Another explanation of the high response rate could be that the physicians were interested to know their background in nutrition, since they felt that they might have poor nutritional knowledge. The mean mark for correctly answered questions was 52.1%. It was almost similar to that reported by Al-Numair (51.7%).<sup>13</sup> It was higher than the study on family practice residents in Texas using multiple choice questions, where they reported a score of (50.7%),<sup>9</sup> but lower than that achieved in the survey of nutritional knowledge of physicians in Canada (63%).<sup>12</sup> In a comparable study reported from Taiwan,<sup>10</sup> the mean score for correctly answered questions was 59%, while it was 69.2% from California.<sup>8</sup> Both were better than the score achieved in the present study. However, the questionnaires used were true-false indicating that chance would have increased

the score far better than the scores in this study. In this study, 74 (81%) primary care physicians described their nutritional knowledge as "poor", which is higher than that reported by other studies,<sup>11-13</sup> and another survey showed that only 7% of primary care physicians rated their nutritional knowledge as excellent.<sup>15</sup>

We did not cover all medical conditions related to nutrition, and this is the limitation of our study. However, further studies are needed in the field of nutrition.

In conclusion, these results showed that physicians need more training in nutrition. Nutrition should be an essential part of the curriculum of medical schools and continuing medical education for primary health care physicians.

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### Related topics

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