

Short Communication

Survey of nutrition knowledge of physicians in Kuwait

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Abstract

Objective: The objective of the present study was to determine whether nutrition knowledge differs between male and female physicians working in Kuwait City, Kuwait.

Design: The study employed a cross-sectional analysis of physician's nutrition knowledge by using a sixteen-item multiple-choice questionnaire.

Setting: Governmental hospitals in Kuwait City, Kuwait.

Subjects: One hundred Kuwaiti physicians (fifty males; fifty females) working in Kuwait City, Kuwait.

Results: A response rate of 73% was achieved (forty males; thirty-three females). The mean percentage of correctly answered questions was 60%. The male and female physicians averaged 56% and 65% of correct responses, respectively ($P=0.042$). However, only for two questions did male and female physicians' scores differ significantly ($P<0.05$). The two age groups (<40 years; ≥ 40 years) had equal mean total correct scores (60%, $P=0.935$). Physicians' knowledge was greatest for topics that have received a great deal of media coverage in Kuwait. Most (70%) of the physicians described their nutrition knowledge as 'moderate'.

Conclusions: Physicians in Kuwait gave inaccurate information regarding common problems in Kuwaitis such as obesity, hypertension and osteoporosis. In view of the public's perception of the role of the physician in providing nutrition advice, it is imperative that nutrition and diet training be part of continuing medical education to bridge these deficiencies in physicians' knowledge.

Keywords
Nutrition
Knowledge
Kuwait
Physicians

Poor nutrition is considered to be the most modifiable risk factor for long-term health^(1,2). Several illnesses such as CVD, type 2 diabetes, hypertension and numerous cancers are linked, at least in part, to poor diet^(3–6). The success of treatments and interventions used to address these illnesses hinges on improving diet and nutrition status^(7,8).

Physicians are generally considered by the public as a reliable source of information related to nutrition^(4,5). However, a study with physicians in Alberta, Canada revealed that 42% described their knowledge of nutrition as weak⁽⁹⁾. Nutrition knowledge questionnaires of physicians from California⁽¹⁰⁾ and from Canada⁽⁹⁾ revealed correct response rates of only 69% and 63%, respectively. Primary care physicians in Taiwan⁽⁸⁾ and family practice residents in Texas⁽¹¹⁾ scored even more poorly (59% and 51%, respectively). A 1995 national survey of American physicians revealed that many barriers – lack of nutrition knowledge, lack of time, poor patient compliance and inadequate counselling skills – prevented physicians from giving proper dietary counselling⁽¹²⁾.

Identifying weaknesses in nutrition knowledge among Kuwaiti physicians may provide guidance to improve their understanding of nutrition in the future. Therefore, the aim of the present study was to determine whether or not differences exist in the nutrition knowledge of male and female physicians working in Kuwait City, Kuwait.

Methods

A cross-sectional study was conducted on randomly selected male and female Kuwaiti physicians employed by hospitals that are part of the Ministry of Health in Kuwait City, Kuwait. The sample size for the study was calculated on the basis of a 2% difference in the total percentage score of nutrition knowledge between male and female physicians. From previous studies^(13,14), an estimated standard deviation of the total percentage score of nutrition knowledge was 2.74%. The effect size was computed using Cohen's effect size measure (d) for comparing differences in two independent groups.

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To detect this difference with a power of 80% at the 5% significance level (two-sided), each of the two groups (males and females) required thirty-one subjects. To account for non-participation, the sample size was increased to 100 physicians (fifty males; fifty females) working in governmental hospitals in Kuwait City, Kuwait.

A nutrition knowledge questionnaire was adopted and modified from Temple⁽⁹⁾. In the first part of the questionnaire respondents were asked to give their gender, age, area of specialty and to self-rate their nutrition knowledge as poor, moderate or excellent⁽⁹⁾. The second part of the questionnaire consisted of sixteen multiple-choice questions, each with three possible answers. The questionnaire was pre-tested on eight physicians (four males; four females) by cognitive interviews (concurrent probes) to assess comprehension of the questions. The nutrition knowledge questionnaire was hand-delivered to each of the 100 Kuwaiti physicians working in various medical departments such as primary health care, nephrology, surgery, paediatrics and gynaecology in Kuwait City, Kuwait. The non-respondents received a second questionnaire and a telephone call. The completed questionnaires were received in a sealed envelope. The sixteen questions and the correct answers are presented in Table 1.

Data were analysed using the SPSS statistical software package version 11.0. Descriptive statistics were used to display data in percentages and mean. Percentages have been rounded-off to the whole value. Student's *t* test was conducted to assess the differences in nutrition knowledge by gender, age and specialization.

Results

A response rate of 73% was achieved in the current study (forty males; thirty-three females). The age range of male physicians was 25–57 years, mean 40 years; while the age range of female physicians was 25–53 years, mean 38 years. From the seventy-three respondents, thirty-five were primary health care physicians, nineteen were surgeons, sixteen were paediatricians and three were gynaecologists.

The mean score for correctly answered questions in the overall sample was 60%, with males and females averaging 56% and 65%, respectively ($P=0.042$). The percentages of correct responses to the sixteen questions from the questionnaire are presented for the overall sample and according to gender in Table 2. There were no significant differences between genders on most of the questions ($P>0.05$) except for questions 2 ($P=0.019$) and 8 ($P=0.002$).

Differences in nutrition knowledge scores by age group (<40 years; ≥40 years) are shown in Table 3. Both age groups had an equal mean percentage of correctly answered questions (60%).

Table 4 shows that 74% (41% of males; 33% of females) of the physicians described their knowledge of

Table 1 Nutrition knowledge questionnaire

| | |
|---|------------------------------------|
| 1. What type of dietary fibre is helpful in lowering the blood cholesterol level? | a. Soluble fibre* |
| | b. Insoluble fibre |
| | c. Cellulose |
| 2. Excess of which nutrient may increase body calcium loss? | a. Protein* |
| | b. Saturated fat |
| | c. Sugar |
| 3. A nutrient believed to help prevent thrombosis is: | a. Omega-3 fat* |
| | b. Monounsaturated fat |
| | c. Vitamin C |
| 4. The adequate intake level of calcium for adult aged 51–70 years is: | a. 500 mg/d |
| | b. 1200 mg/d* |
| | c. 2000 mg/d |
| 5. The major type of fat in olive oil is: | a. Saturated fat |
| | b. Polyunsaturated fat |
| | c. Monounsaturated fat* |
| 6. Compared with unprocessed vegetable oil, hydrogenated fats contain: | a. More polyunsaturated fat |
| | b. More trans fats* |
| | c. More cholesterol |
| 7. Which nutrient is protective against hypertension? | a. Potassium* |
| | b. Chlorine |
| | c. Iron |
| 8. Which vitamin is likely to be toxic if consumed in an excess amount for a long period of time? | a. Vitamin C |
| | b. Vitamin A* |
| | c. Vitamin D |
| 9. The most concentrated source of vitamin B ₁₂ is: | a. Fruit |
| | b. Whole grain cereals |
| | c. Meat* |
| 10. Which substance raises the blood HDL-cholesterol level? | a. Animal protein |
| | b. Riboflavin |
| | c. Alcohol* |
| 11. In general, dietary recommendations are intended to: | a. Maximize food efficiency |
| | b. Maintain public health* |
| | c. Increase athletic performance |
| 12. Type of food believed to have a preventive effect on various types of cancer is: | a. Fruit and vegetables* |
| | b. Milk |
| | c. None of the above |
| 13. The number of kilocalories in one gram of fat is: | a. 4 |
| | b. 7 |
| | c. 9* |
| 14. Which of the following is not an antioxidant nutrient? | a. Vitamin E |
| | b. β-Carotene |
| | c. Zinc* |
| 15. The nutrient strongly associated with the prevention of neural tube defects is: | a. β-Carotene |
| | b. Folate* |
| | c. Vitamin C |
| 16. Short-term (diet) plans 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 |
| Nutrition knowledge question: How do you rate your nutritional knowledge? | |
| | a. Poor |
| | b. Moderate |
| | c. Excellent |

*indicates the correct answer.

Table 2 Percentages of correct answers to the nutrition knowledge questions, overall and according to gender, among Kuwaiti physicians (forty males; thirty-three females) working in Kuwait City, Kuwait

| Question | % of correct answers | | | P value* | SED (%) |
|---|----------------------|-----------------|-------------------|----------|---------|
| | Overall | Male physicians | Female physicians | | |
| 1. Dietary fibre helpful in lowering blood cholesterol level | 44 | 43 | 45 | 0.803 | 12 |
| 2. Excess of which nutrient may increase body calcium loss | 40 | 28 | 55 | 0.019 | 11 |
| 3. Nutrient believed to help prevent thrombosis | 75 | 78 | 73 | 0.643 | 10 |
| 4. Adequate intake level of calcium for adult aged 51–70 years | 59 | 55 | 64 | 0.462 | 12 |
| 5. Major type of fat in olive oil | 40 | 43 | 36 | 0.600 | 12 |
| 6. Hydrogenated fats contain | 56 | 48 | 67 | 0.103 | 12 |
| 7. Nutrient protective against hypertension | 75 | 68 | 85 | 0.089 | 10 |
| 8. Vitamin likely to be toxic if consumed in excess amount | 56 | 40 | 76 | 0.002 | 11 |
| 9. Most concentrated source of vitamin B ₁₂ | 44 | 48 | 39 | 0.494 | 12 |
| 10. Substance raising blood HDL-cholesterol level | 32 | 30 | 33 | 0.764 | 11 |
| 11. In general, dietary recommendations are intended to | 67 | 73 | 61 | 0.288 | 11 |
| 12. Foods having preventive effect on various types of cancer | 89 | 88 | 91 | 0.648 | 7 |
| 13. Number of kilocalories in one gram of fat | 84 | 80 | 88 | 0.373 | 9 |
| 14. Nutrient is not an antioxidant | 53 | 45 | 64 | 0.115 | 12 |
| 15. Nutrient associated with prevention of neural tube defects | 86 | 85 | 88 | 0.726 | 8 |
| 16. 'Diet' plans are usually successful at achieving weight loss because they | 58 | 50 | 67 | 0.156 | 12 |
| Mean score for correctly answered questions | 60 | 56 | 65 | 0.042 | 11 |

*Based on independent-samples *t* test with *df* = 71.**Table 3** Percentages of correct answers to the nutrition knowledge questions, according to age group, among Kuwaiti physicians (forty males; thirty-three females) working in Kuwait City, Kuwait

| Question | % of correct answers | | P value* | SED (%) |
|---|----------------------|------------------|----------|---------|
| | <40 years (n 40) | ≥40 years (n 33) | | |
| 1. Dietary fibre helpful in lowering blood cholesterol level | 45 | 42 | 0.828 | 12 |
| 2. Excess of which nutrient may increase body calcium loss | 50 | 27 | 0.049 | 11 |
| 3. Nutrient believed to help prevent thrombosis | 85 | 64 | 0.035 | 10 |
| 4. Adequate intake level of calcium for adult aged 51–70 years | 50 | 70 | 0.091 | 11 |
| 5. Major type of fat in olive oil | 33 | 48 | 0.169 | 12 |
| 6. Hydrogenated fats contain | 65 | 45 | 0.096 | 12 |
| 7. Nutrient protective against hypertension | 80 | 70 | 0.316 | 10 |
| 8. Vitamin likely to be toxic if consumed in excess amount | 63 | 48 | 0.236 | 12 |
| 9. Most concentrated source of vitamin B ₁₂ | 50 | 36 | 0.249 | 12 |
| 10. Substance raising blood HDL-cholesterol level | 28 | 36 | 0.424 | 11 |
| 11. In general, dietary recommendations are intended to | 65 | 70 | 0.676 | 11 |
| 12. Foods having preventive effect on various types of cancer | 83 | 97 | 0.050 | 7 |
| 13. Number of kilocalories in one gram of fat | 75 | 94 | 0.030 | 9 |
| 14. Nutrient is not an antioxidant | 45 | 64 | 0.115 | 12 |
| 15. Nutrient associated with prevention of neural tube defects | 88 | 85 | 0.747 | 8 |
| 16. 'Diet' plans are usually successful at achieving weight loss because they | 58 | 58 | 0.995 | 12 |
| Mean score for correctly answered questions | 60 | 60 | 0.935 | 11 |

*Based on independent-samples *t* test with *df* = 71.**Table 4** Counts of self-rated nutrition knowledge, according to age group and gender, among Kuwaiti physicians (forty males; thirty-three females) working in Kuwait City, Kuwait

| Age group | Gender | Nutrition knowledge | | | | | | | |
|-----------|--------|---------------------|----|----------|----|-----------|----|----------|-----|
| | | Poor | | Moderate | | Excellent | | Total | |
| | | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % |
| <40 years | Male | 5 | 7 | 15 | 22 | 0 | 0 | 20 | 29 |
| | Female | 2 | 3 | 12 | 17 | 2 | 3 | 16 | 23 |
| ≥40 years | Male | 0 | 0 | 13 | 19 | 7 | 10 | 20 | 29 |
| | Female | 0 | 0 | 11 | 16 | 2 | 3 | 13 | 19 |
| Total | | 7 | 10 | 51 | 74 | 11 | 16 | 69 | 100 |

nutrition as 'moderate'. All physicians who rated their nutrition knowledge as 'poor' were in the <40 years age group. The proportion of physicians who rated their nutrition knowledge as 'poor' was higher among males (7%) compared with females (3%). Furthermore, the proportion of those who rated their nutrition knowledge as 'excellent' was higher among males (10%) than females (6%). Out of the seventy-three respondents, four females chose not to rate their nutrition knowledge, thereby reducing the number of replies for this question to sixty-nine.

Discussion

The response rate in the current study (73%) was higher than what was reported by Al-Numair (56%) in Saudi Arabia⁽¹³⁾, but higher than that (27%) in a study of nutrition knowledge among primary care physicians in Taiwan reported by Schulman⁽⁸⁾. Al-Zahrani and Al-Raddadi's⁽¹⁴⁾ survey on nutrition knowledge of primary health care physicians in Jeddah, Saudi Arabia showed the same response rate as observed in the present study. In two distinct surveys of nutrition knowledge of physicians, one conducted by Temple⁽⁹⁾ in Canada and the other by Mlodinow and Barrett-Connor⁽¹⁰⁾ in California, the response rates were 36% and 40%, respectively. These results were comparatively lower than the response rate (73%) achieved in our study. Seventy-four per cent of the physicians in the present study self-rated their nutrition knowledge as 'moderate'. 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.

The mean score for correctly answered questions in the present study (60%) was slightly lower than that observed in the survey of nutrition knowledge among physicians in Canada (63%)⁽⁹⁾ and comparatively higher than the score (52%) reported by Al-Numair⁽¹³⁾ for physicians working in Saudi Arabia. The mean score for correctly answered questions in the California study (70%)⁽¹¹⁾ was higher than we found (60%). However, the questions in the California study were true-false indicating that chance would have raised the score far more than was the case here in our study. Other studies published by Kirby *et al.*⁽¹¹⁾ and Al-Zahrani and Al-Raddadi⁽¹⁴⁾, using multiple-choice questions, also reported low scores of 51% and 52%, respectively.

The results of the present study in Table 2 indicate that Kuwaiti physicians were aware of information publicized in the medical press such as the role of *n*-3 fatty acids, foods and nutrients that are protective against cancer, hypertension, neural tube defects and number of kilocalories in one gram of fat (notably questions 3, 7, 11, 12, 13 and 15). This tendency was similar to findings of Al-Numair⁽¹³⁾ and Temple⁽⁹⁾. However, a low number of physicians gave the correct answer to questions that are less

likely to appear in the press (questions 1, 2, 4, 5, 6, 8, 9, 10, 14 and 16), showing poor knowledge of topics including the role of soluble fibre in lowering blood cholesterol level, the effect of consuming too much protein on body Ca, the adequate intake level of Ca, the major type of fat in olive oil and hydrogenated fats, and the functions and sources of different vitamins and minerals.

Conclusions

Overall, the present results indicate that there are severe gaps in nutrition knowledge among Kuwaiti physicians working in Kuwait City, Kuwait. Several studies along with the current one suggest that many physicians do not have the knowledge to properly advise their patients on the essential role of nutrition in the causation, prevention and treatment of different diseases. Therefore, nutrition should be a fundamental part of continuing medical education and it should be properly integrated into the curriculum of medical schools.

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