



Nutritional Knowledge and Awareness of Primary Health Care Physicians Working in Hail Region, Saudi Arabia: A cross-Sectional Study

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Abstract

Nutrition and its awareness play an important role in medical education for the management, as well as in the treatment of various chronic illnesses. Moreover, it always has been a concern about the knowledge and awareness of nutrition among physicians. Therefore, we aimed to study the nutritional knowledge, as well as awareness of primary health care physicians (PHC) working in Hail City, Saudi Arabia. A questionnaire-based cross-sectional survey was conducted among PHC physicians working in Hail, Saudi Arabia from September 2019 to December 2019. The questionnaire was distributed to PHC physicians and responses were recorded and data were statistically analyzed by applying Chi-square tests using SPSS 21.0. Questionnaires were circulated to 124 physicians, participated in this study. However, out of 124 physicians only 41 physicians filled out the complete questionnaire, indicating a very poor response rate (33%). The mean percentage of correct answers was 71.56%. Physicians who described their knowledge as "good" were found to be 75%. Furthermore, physicians working in PHC centers were aware of the basic nutritional knowledge regarding food content, pregnancy, lactation, diabetes, hypertension, etc. Our assessment revealed that physicians working in PHC of Hail Region had average nutritional knowledge. Moreover, it was also found that addition of various nutrition related educational programs in medical schools and hospital premises would improve the knowledge and awareness among the physicians.



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Introduction

Nutrition plays an important role in the development and management of good health including the prevention of malnutrition, as well as in the treatment of various diseases. According to several reports, it's been found that 1 out of 5 deaths are associated with poor diet. Conferring to survey reports conducted in 2017, showed that poor diet habit and other dietary risk factors have costed around 11 million deaths, as well as 255 million disability-adjusted life years (DALYs). Of note, the Kingdom of Saudi Arabia has also been accounted for 25.6% of all deaths along with 17.4% DALYs due to poor diet habits among adults in 2017.¹⁻³ Hence, knowledge of nutrition could establish better nutritional habits for an individual as well as for society. In recent times, nutrition and its awareness among the population have increased, and people are looking for more reliable nutritional information from authentic sources.⁴⁻⁶ Even in several countries, physicians are advised to deliver nutritional care to improve the dietary behaviors of patients, individuals and populations. Thereby, interdisciplinary collaboration of the healthcare team in the hospital premises would ensure high-quality nutritional care.^{7, 8}

PHC physicians are described as a general physicians, who had accomplished one-year internship program or family practitioners who had accomplished³⁻⁴ years of residency training in family medicine after graduating from the medical college.⁹ In addition to that, PHC physicians are usually the initial point for the patients to provide medical diagnosis and treatment within the health care system. PHC approach is a sort of whole-of-society approach to provide health and well-being focused on the needs and preferences of individuals, families and communities. Medical professionals have been seen for endorsing various healthy nutritional behaviors and help in promoting nutrition care.^{10 11} Physicians most frequently use health information for the diagnosis of diseases, and consequently, it is also expected from the physicians to deliver a piece of better nutritional advice to the patients.^{9,12} However, it has been observed that physicians do not feel comfortable or adequately prepared to provide nutritional counselling to their patients. Traditionally, it is considered that physicians are not well-versed to assess and treat nutrition-related problems in their patients.¹³ Insufficient nutrition

practice is strongly influenced by lack of knowledge in nutritional science. Students who graduated from medical colleges have been reported for not having enough nutrition related information, as well as services required to effectively support the eating behavior of the patients. This nutritional insufficiency of knowledge tends to continue in their medical practice.^{7, 14, 15} However, it is unclear whether PHC physicians in the Saudi Arabia, especially in Hail province are sufficiently competent and aware of nutrition knowledge. Therefore, this study was designed to evaluate the nutrition related knowledge and awareness of PHC physicians working in Hail province of Saudi Arabia, as well as to ascertain whether nutrition proficiencies of PHC physicians are associated with patients nutrition care.

Materials and Methods

A descriptive cross-sectional study was designed and carried out for PHC physicians of Hail Province, Saudi Arabia from September to December 2019. A structured and anonymous questionnaire was adopted and designed with certain modifications from Temple & Al-Numair.^{16, 17} The questionnaire was divided into three parts; the first part relates the demographic information. Second part of the questionnaire was to determine how the physicians rate their own nutrition knowledge with 4 possible choices i.e., poor, mediocre, good, and excellent, and the last part of the questionnaire consisted of 20 multiple-choice questions (MCQs) (Table 1), each with three possible answers. The objective of this study was well-explained along with a consent form to all the physicians, and all of them agreed to participate in the study voluntarily. The survey was sent electronically to all physicians working in PHC centers of Hail, but due to the poor response, hard copies of the questionnaire were also given directly to all the physicians. In addition, ethical approval was granted by the Department of Clinical Nutrition, College of Applied Medical Sciences, University of Hail, Hail, and Saudi Arabia prior to conducting this study.

Place of Study and Study Population

PHC located in Hail regions were divided into 10 centers in North and 16 centers in South of the city consisting of 67 and 57 physicians respectively, resulting in an overall of 124 physicians.

Table 1: Nutrition awareness and knowledge questionnaire

Questions	Option A	Option B	Option C
Nutritional Awareness			
In case of diarrhea	Increase fiber and decrease water	decrease fiber and increase water*	increase fiber and water
During dehydration, it's better to increase	Iron	Potassium*	Magnesium
Nutritional Knowledge			
What type of dietary fiber is helpful in lowering blood cholesterol levels?	Soluble fiber*	Insoluble fiber	None of them
What is the main protein in human milk?	Albumin	Casein*	Ovalbumin
Excess of that nutrient may increase body calcium loss	Iron	Protein*	Fat
Dyslipidemia patients are more likely to develop	<i>Diabetes mellitus</i> type 1	<i>Diabetes mellitus</i> type 2*	Gestational diabetes
The major type of fat in olive oil	Saturated fatty acids	Monounsaturated fatty acids*	Polyunsaturated fatty acids
A nutrient that improves inflammation symptoms	Sodium	Saturated fat	Omega 3*
The most concentrated source of vitamin B12 is	Meat*	Whole grains	Fruit
Protect against hypertension	Iron	Thiamin (B1)	Potassium*
Which vitamin is likely to be toxic if consumed in excess amount for a long period of time?	Thiamin (B1)	vitamin A*	Biotin (B7)
If the BMI of an adult is between 25-29.9, that indicates the individual is	Underweight	Overweight*	Obese
A food believed to have a preventive effect on various types of cancer is	Milk	Meat	Fruit and Vegetables*
Compared with unprocessed vegetable oil, hydrogenated fats contain	More saturated fat	More trans- fat*	Lower cholesterol
A nutrient strongly associated with the prevention of neural tube defects is	Folate*	Calcium	Copper
Number of Kilocalories in one gram of fat is	4	5	9*
A vitamin which plays a critical role in thrombosis	Vitamin A	Vitamin D	Vitamin K*
Which of the following is not an antioxidant nutrient?	Vitamin C	Vitamin E	Iron*
A nutrient works as a surfactant in the respiratory system	Saturated Fat	Phospholipids*	Protein
Which of the following fruits & vegetables is a rich source of lycopene?	Tomatoes*	Cauliflower	Oranges

Statistical Analysis

Statistical Package for Social Science (SPSS) program (version 21; IBM Inc.,) was used for the statistical analyses. Chi-squared tests were applied to measure the significances among the measured variables. In addition, descriptive analysis was also performed and frequencies and percentages were measured.

Table 2: Demographic information of the physicians

Variable	Frequency (%)
Gender	
Male	19 (46.3)
Female	22 (53.7)
Education	
Bachelor	28 (68.3)
Master	11 (26.8)
Fellowship	2 (4.9)
Experience (Year)	
<11	22 (53.6)
11-20	13 (31.7)
>20	6 (14.6)
Suffering from a chronic medical condition	8 (19.5)
Additional education about nutrition	7 (17.1)

Results and Discussion

Physician's recommendation plays an important role in patients diet-related behaviors, as well as their food consumption pattern. However, several factors such as inadequate time with the patient, minimal nutritional education, low reimbursement, as well as lack of comfort counseling about dietary patterns have been noticed.¹⁸ The results of our study showed that out of 124 physicians, 41 physicians responded to our questionnaire, which was sent through electronic media such as WhatsApp, E-mail as well as providing with the hard copy. The response rate by the PHC physicians was 33%, which was found to be very poor against the previous study presented by various authors which were 56.2%, 72.8%, and 73% respectively.^{5, 17, 19} According to a previous study, a reviewed report of 458 articles showed that mean nutrition knowledge score across all studies were considered poor (35%) to fair (65%).²⁰ The reason behind the poor response rate could be because

WhatsApp was used as a mode of sending the questionnaire at the beginning of the study, the lack of interest in completing a paper questionnaire, and lack of time. Meanwhile demographic and general characteristics of the PHC physicians are presented in Table 2.

The results of our study showed that a wide range of age groups of physicians ranging from 25 to 63 years, majority of them were females (53.7%), when compared to males (46.3%). In addition, most of the PHC physicians were holding a Bachelor's degree in medical sciences (68.3%) followed by a Master's (26.8%) and Fellowship (4.9%) as presented in Table 2. Based upon the question of physician's self-evaluation of their nutrition knowledge, 73% of physicians rated themselves as good. However, 12.2 % evaluated themselves as mediocre, followed by poor and excellent as presented in Figure 1. On a scale of 100-86 (Excellent), 85-71 (Good), 70-56 (Mediocre), and <56 (Poor), our results indicates that physicians had mediocre nutritional knowledge (Figure 1). More importantly, all the physicians mentioned that they advise their patients about nutrition importance, which provides a positive nutritional attitude among the patients.

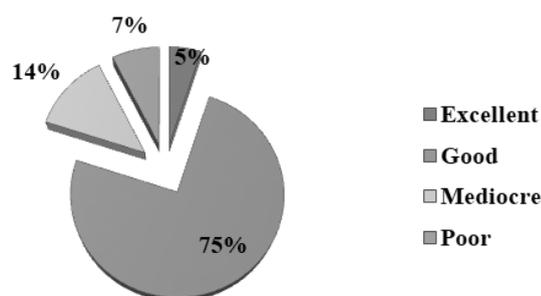


Fig. 1: Physician's self-evaluation report to their nutrition knowledge

Furthermore, in terms of nutritional awareness of PHC physician's, we put two questions in the questionnaire related to diarrhea and dehydration, because both of them are major illnesses related to nutrition. Dehydration is a significant draining of body water and electrolytes, while diarrhea is a loose, watery stools. Nutritional awareness during these two situations is essential. In this study, nutrition awareness of dehydration and diarrhea among the PHC physicians was assessed and the results showed good nutritional awareness about diarrhea

and dehydration with the p-value 0.188 and 0.269 respectively. The male physicians overtook female physicians on the nutrition awareness of dehydration (Table 3). The highest percentage of the correct answer was reported on dehydration compared to diarrheal nutrition awareness. Dehydration and diarrhea were the most significant causes of morbidity and mortality, mainly among children.²¹ Therefore, the nutrition intervention during these conditions will reduce their morbidity and mortality. Moreover, nutritional knowledge of PHC physician's correct answers is presented in Table 3. In context of gender, female physicians in all the 18 questions overtook male physicians, except in one question (no.12), where they were found to be equal. Question number 3 and 12 showed poor nutritional knowledge about protein, calcium loss and hydrogenated fats. On the other hand, questions 4, 11, 13 showed very good nutritional knowledge about dyslipidemia and diabetes, foods against cancer, and nutrients that prevent neural tube defects. The highest

percentage of the correct answer was found for question number 13; "A nutrient strongly associated with the prevention of neural tube defects is", which provided a positive thought that PHC physicians can advise pregnant women on such topic. However, the lowest percentage of the correct answer was found for question number 3; "Excess of that nutrient may increase body calcium loss" followed by number 12; "Compared with unprocessed vegetable", which displayed negative thoughts about PHC knowledge about protein and electrolytes. There was no significance in the percentage of correct answers based on education and experience. The mean percentage for correctly answered questions in overall sample questionnaire was 72.5%. The mean percentage in our study was higher than those in Riyadh (51.7%), Jeddah (52.1%), Kuwait (60%), Qatar (63.9%) and California (69.3%), but that could be due to the low response rate in our study compared to other studies.^{5, 17, 19, 22, 23}

Table3: Nutritional awareness, knowledge and percentage of correct answers

Sr. No.	Questions	N	Correct answer %	Male %	Female %	P-value
Awareness						
1	In case of diarrhea, decrease fibre and increase water content?	41	53.7	40.9	59.1	0.188
2	During dehydration, it's better to increase potassium supplementation	40	72.3	64.3	35.7	0.269
Knowledge						
3	What is the main protein in human milk?	40	67.5	44.4	55.6	0.227
4	What type of dietary fiber is helpful in lowering blood cholesterol levels?	40	70.0	42.9	57.1	0.184
5	Excess of protein nutrient may increase body calcium loss	35	31.4	36.4	63.6	0.182
6	Dyslipidemia patients are more likely to develop Diabetes mellitus type 2?	41	92.7	42.1	57.9	0.091
7	The major type of fat in olive oil is monounsaturated fatty acids	39	56.4	40.9	59.1	0.140
8	Omega 3 improves inflammation symptoms?	40	77.5	48.4	51.6	0.288
9	The most concentrated source of vitamin B12 is meat	41	58.5	41.7	58.3	0.195
10	Does potassium protect against hypertension?	40	72.5	44.8	55.2	0.277
11	Which vitamin is likely to be toxic if consumed in excess amount for a long period of time?	41	80.5	39.4	60.6	0.066

12	If the BMI of an adult is between 25-29.9 that indicates the individual is overweight	41	85.4	40	60	0.057
13	A food believed to have a preventive effect on various types of cancer is fruit & vegetable	41	92.7	42.1	57.9	0.091
14	Compared with unprocessed vegetable oil, hydrogenated fats contain a high amount of trans fat?	38	42.1	50	50	0.248
15	A nutrient strongly associated with the prevention of neural tube defects is folate	41	95.1	43.6	56.4	0.209
16	The number of Kilocalories in one gram of fat is 9	39	61.5	29.2	70.8	0.008*
17	A vitamin which plays a critical role in thrombosis is vitamin K	82.9 41	47.1	52.9	0.315	
18	Which of the following is not an antioxidant nutrient?	39	79.5	38.7	61.3	0.016*
19	A nutrient works as a surfactant in the respiratory system phospholipids	41	85.4	42.9	57.1	0.199
20	Which of the following is rich in Lycopene?	38	73.7	39.3	60.7	0.027*

N number of physicians answered the questions (out of 41)

*based on Chi-Square test

Conclusion

PHC physicians in the city of Hail, Saudi Arabia were found to be generally aware about nutrition and its importance in health care systems. However, seeking to results of this study, we conclude that, further improvements in nutritional knowledge are needed to provide better patient care. Additionally, medical students, as well as a full fledged medical practitioner should constantly participate in nutrition promoting programs including nutrition-based courses in continuous medical education (CME), because the nutrition awareness among physicians will pass their knowledge to patients and can further help in decreasing the prevalence of diseases, ultimately reduction in high rate of drug consumption. Adequate knowledge of nutrition is essential for physicians to work as active team member to upkeep the nutritional requirements of the patients. Furthermore, this study can be explored at a large

scale to get a clear picture of nutritional knowledge of the Saudi Arabia PHC physicians.

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Conflict of Interest

The authors do not have any conflict of interest.

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