

Nutrition Knowledge, Education, and Counseling Practices of Primary Care Physicians in Saudi Arabia: A Systematic Review

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Abstract

Primary care medical doctors (PHC) are in a pivotal position to influence patients' dietary habits through the provision of nutrition education. This systematic review was conducted to assess the latest evidence on physicians' knowledge and practical involvement in nutrition education within healthcare facilities across Saudi Arabia. Databases including PubMed, Web of Science, ScienceDirect, EBSCO, and the Cochrane Library were searched. Screening and selection of studies were performed using Rayyan QCRI, starting from titles and abstracts, followed by full-text assessments. Eight eligible studies were identified, which included participants of various ages and genders. Although study designs varied, cross-sectional methodologies predominated, and all were methodologically sound. Findings consistently indicated that primary care physicians generally possess only moderate nutrition knowledge, primarily limited to fundamental principles necessary for basic nutrition care delivery. The evidence also highlighted deficiencies in medical students' preparedness in terms of knowledge, attitude, and confidence related to nutrition counseling, underlining the inadequacy of current nutritional education in their training. Therefore, it is essential to increase the nutritional knowledge of intern physicians and primary care physicians. Strengthening their clinical competencies in nutrition will better equip them to deliver effective dietary recommendations and support behavioral changes among patients, ultimately improving overall health outcomes. To achieve sustained progress, PHC physicians should engage in ongoing nutrition education programs, which would contribute significantly to improving public health through consistent and reliable Nutrition counseling.

Keywords: Nutrition counseling, Nutrition education, Nutrition knowledge, Primary care physicians

Introduction

A well-balanced diet plays a pivotal role in both the prevention and management of various illnesses. Many individuals recognize this link and often seek nutritional

and exercise guidance from their healthcare providers. Yet, in day-to-day medical practice, the nutritional dimensions of diseases such as cancer, obesity, and diabetes are often underrepresented [1]. When physicians feel ill-equipped, lack confidence, or are uncertain about their capabilities, their ability to deliver effective nutrition advice is compromised, potentially stemming from a limited understanding of basic nutrition science and a lack of familiarity with intervention strategies [2]. In the Kingdom of Saudi Arabia (KSA), in 2017, poor dietary habits contributed to 25.6% of adult mortality and accounted for 17.4% of adult DALYs [3]. The country also faces growing rates of chronic diseases, with type 2

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diabetes affecting 13.2%, hypertension impacting 15.2%, and obesity rising to 28.7% of the population [4].

Nutrition care refers to any physician-led research or intervention that encourages patients to improve their dietary behaviors, which in turn influences disease indicators [4]. During standard medical visits, this care may include nutrition assessment, nutrition guidance, and Nutrition counseling [5]. Evidence from international studies has shown that when Primary care physicians deliver nutrition care, patients are more likely to adopt healthier eating patterns [6]. Moreover, patients tend to trust dietary advice coming from Primary care physicians more than that offered by dietitians [7].

Many family physicians acknowledge the critical role they play in managing patients' nutrition, especially among those with elevated health risks due to dietary habits or BMI [8]. Strengthening this role requires the integration of nutrition-focused training in medical education; thus, including nutrition content in undergraduate nursing curricula or ongoing professional development is essential to build Nutrition knowledge among practitioners [2].

Research findings also reveal that primary care physicians often lack sufficient nutrition knowledge for chronic disease management, and only approximately one-third of primary care patients receive any form of nutrition counseling during medical visits [9]. Key challenges that hinder the provision of nutritional guidance by primary care physicians include limited consultation time, insufficient patient adherence, inadequate counseling skills, knowledge gaps, and the absence of financial incentives [10].

Study Rationale

Improving population-wide dietary behavior must become a core priority within KSA's healthcare agenda. This opens a significant avenue for primary care physicians to lead efforts in guiding the Saudi community toward healthier eating practices.

Objective of the Study

This research seeks to synthesize current evidence regarding physicians' Nutrition knowledge and the extent to which they engage in Nutrition education practices within healthcare centers throughout Saudi Arabia.

Materials and Methods

A structured investigation was carried out using a systematic review methodology, based on the PRISMA guidelines, to explore how nutrition education is delivered to patients dealing with chronic diseases in primary healthcare centers across Saudi Arabia.

Design and Time Frame

The review followed a systematic design and took place between July and October 2022.

The focus of the Review

The analysis sought to gather insights from previous studies that examined the implementation of nutrition education among individuals receiving care for chronic conditions within Saudi Arabian primary health care centers.

Information Retrieval Process

A thorough data-gathering effort spanned five major academic platforms: Cochrane Library, PubMed, Web of Science, Science Direct, and EBSCO. Only articles published in English and related to human subjects were included. A tailored set of keyword combinations—such as “nutrition education in primary health care centers in Saudi Arabia” and “nutrition education for patients with chronic diseases in Saudi Arabia”—were configured with Boolean connectors like “AND” and “OR” to refine the search per database. Filters were applied to ensure that only open-access and full-text studies were considered.

Eligibility Guidelines

Studies were included if they met the following:

- Utilized observational or retrospective methodologies
- Presented data, either qualitative or quantitative, on nutrition education targeting individuals visiting primary care centers

The following criteria excluded studies from the review:

- Not published in English
- Not freely available

Screening and Extraction Procedure

To manage the search results, Rayyan QCRI software was employed to eliminate duplicates. An initial screening of titles and abstracts was conducted, followed by full-text reviews using strict eligibility standards. Any disagreements during this phase were settled collaboratively. A pre-designed data charting tool was

used to record core details such as author, year, study approach, participant demographics, and observations on the delivery of nutrition education concerning chronic disease management in primary care centers.

Assessment of Study Validity

The ROBINS-I framework was adopted to evaluate the methodological soundness of non-randomized research included in the analysis. Reviewers cross-checked assessments and addressed any conflicting evaluations through discussion.

Approach to Results Interpretation

A qualitative synthesis was performed using a summary table to organize findings across studies. Studies that passed full-text review but failed to report any aspect of nutrition education in the setting of primary health care centers were ultimately removed from the synthesis.

Results and Discussion

As shown in **Table 1**, the collective findings from the included studies reveal that primary care physicians generally possess only a modest level of nutrition knowledge, limited primarily to fundamental concepts necessary for delivering nutrition care. This gap appears to stem from the deficiencies in medical school curricula, as seen in the insufficient nutrition knowledge, attitudes, and self-assurance of medical students when it comes to offering nutrition counseling. To bridge this educational shortfall, both intern doctors and primary care physicians must enhance their understanding of clinical nutrition. Strengthening their competence in this area would enable them to deliver more tailored and effective nutrition counseling, thereby supporting patients in adopting healthier eating habits and managing health conditions more successfully. To achieve this, the implementation of ongoing nutrition education programs is critical, ensuring physicians consistently provide high-quality dietary guidance that contributes positively to population health.

Table 1. Summary of characteristics of the included studies

Study	Study design	Location	Sample	Study Objective	Key findings
Al-Gassimi <i>et al.</i> [11]	Cross-sectional study	Saudi Arabia	A total of 90 primary care physicians	To assess the correlation between nutrition competence and the provision of nutrition treatment for patients with chronic diet-related conditions.	Although the availability of nutrition care was reported to be limited, doctors felt generally capable in this field. Their confidence in their nutrition skills and knowledge was at a moderate level. The physicians' self-assurance in their nutrition expertise appeared to be strongly linked to their self-reported practice of providing nutrition care.
Asiri <i>et al.</i> [12]	Cross-sectional study	Riyadh, KSA	Total 400 participants	To evaluate various aspects of patient satisfaction regarding the health education services provided at Primary Health Care centers in a prominent medical facility in Riyadh, Kingdom of Saudi Arabia.	Health education services were met with a moderate degree of satisfaction. The preferred method of delivering health education was through individual consultations. Most participants chose doctors as their primary source of health information.
Al Shammari <i>et al.</i> [13]	A questionnaire-based cross-sectional survey	Saudi Arabia	124 physicians were included in the study.	To analyze the nutrition knowledge and understanding of primary health-care providers (PHC) working in Hail City, Saudi Arabia.	The study garnered a modest response rate. Seventy-five percent of physicians assessed their knowledge as "good." Similarly, primary healthcare staff had basic nutritional education and were familiar with essential nutritional information related to topics such as food, pregnancy, lactation, diabetes, and hypertension.

Aldubayan <i>et al.</i> [14]	A cross-sectional study	Riyadh, Saudi Arabia	A total of 332 physicians were included in the study.	To identify gaps in the nutrition knowledge of Saudi physicians, aiming to guide them in improving their expertise in this area.	The average knowledge score of the physicians was found to be low. Physicians who indicated they had received some form of nutritional training or courses scored considerably higher compared to those who had not participated in such training.
Alkhalidy <i>et al.</i> [9]	Cross-sectional study	Jeddah, Saudi Arabia.	A total of 117 physicians were recruited.	To measure the level of nutrition information held by Saudi doctors and address this knowledge gap in Jeddah's health facilities.	The overall score for nutrition information was low. While Saudi doctors demonstrated proficiency in medical-related questions, their understanding of nutrition-related topics was limited. Most Saudi doctors agreed that addressing the nutritional needs of malnourished patients posed significant challenges.
Bavazir <i>et al.</i> [15]	A cross-sectional study	King Abdul-Aziz University, Jeddah, Saudi Arabia.	A total of 100 physician interns were included.	To assess the dietary attitudes and nutrition knowledge of recent medical graduates from King Abdul-Aziz University currently serving as medical interns.	Among the various knowledge categories, the nutrition and diabetes categories received the highest proportion of correct answers, while the nutrition and heart disease categories had the fewest. Approximately 50% of participants expressed satisfaction with the medical nutrition curriculum. This was evident in their abilities, attitudes, and confidence when providing nutritional advice to patients.
Arafa <i>et al.</i> [16]	A cross-sectional Study	Riyadh, Saudi Arabia.	All family physicians	To investigate the understanding of nutrition by primary care doctors concerning cancer prevention, particularly focusing on diet and its role in tumor progression.	Although the average score for physicians' knowledge is decent, it falls short of expectations. Primary care physicians possess a solid understanding of the link between diet and cancer, but it is insufficient. To ensure that both patients and the broader population receive accurate and effective nutritional guidance, continuous participation in nutrition education and training programs is essential.
Alomary <i>et al.</i> [17]	cross-sectional study	Saudi Arabia	707 PHC physicians.	To assess the primary health care knowledge and identify training needs related to obesity management in Saudi Arabia.	Physicians' general understanding of obesity was considered adequate, although most had not participated in specialized training or courses on the subject. The primary area where physicians sought further education was in providing counseling on nutrition and exercise. There were no significant variations in training needs based on gender or nationality.
Al-Muammar [18]	Cross-sectional study	big hospitals in Riyadh, KSA	266	To explore the management and counseling strategies employed by physicians in nutrition and examine factors that might influence these practices.	Only 7.9% of participants reported being involved in all aspects of nutritional counseling and treatment, including medical nutrition therapy, therapy, and education. About 13.9% and 40.2% of respondents indicated they applied one or more of these approaches, while 28% acknowledged that they did not engage in any form of medical nutrition therapy or counseling.

Numerous studies worldwide have highlighted that primary care physicians view nutrition treatment as a vital aspect of their clinical practice [19]. To effectively influence their patients' dietary habits, doctors must build

trust and communicate clearly to understand and address their patients' concerns [20]. Physicians scored the lowest in areas related to their confidence in their nutritional knowledge and abilities. Dumas *et al.*'s

findings regarding inadequate nutrition knowledge are detailed in [21]. Additionally, Al-Gassimi *et al.* [11] suggested that strategies focused on enhancing doctors' nutritional knowledge and capabilities would lead to significant improvements in their proficiency. Potential strategies include placing more emphasis on care delivery in health seminars and group discussions, integrating dietary assessment tools and standards [22], and incorporating more nutrient-focused training into medical curricula.

Al-Gassimi *et al.* [11] also noted that the level of nutrition expertise among doctors varied depending on their professional experience. Family medicine (FM) specialists, for instance, had the highest mean nutrition knowledge scores, surpassing even FM consultants, which might be attributed to advanced training and board certifications that include comprehensive dietary instruction [23].

Female doctors showed more confidence in their nutritional knowledge than their male counterparts, a trend that aligns with previous research. This difference may stem from the longer consultation times typically held by female doctors, who are more likely to integrate lifestyle and diet-related changes into routine care [24].

According to Al-Gassimi *et al.* [11], only 29% of doctors reported providing regular or frequent dietary advice, a figure comparable to the 22% found in Khandelwal *et al.*'s study [24] and 19% in Dumic *et al.*'s report [8]. Moreover, 59% of the physicians in the current study spent less than three minutes addressing nutrition during a typical patient visit. Ockene *et al.* [25] argue that the approach to nutritional counseling should last at least eight minutes to be effective. Despite favorable perceptions of nutrition care, the actual provision of such care was significantly lower than expected.

Inadequate delivery of nutrition care could have detrimental effects on patient outcomes, as many individuals may miss out on essential nutritional guidance that could aid in managing their conditions and improving health. Furthermore, this could diminish the impact of primary care doctors on public health. To enhance population health, it is recommended that medical education include more comprehensive instruction on health behavior change techniques, such as motivational interviewing, and foster the willingness and ability to facilitate behavioral changes. Senior primary care physicians should also model nutrition care as part of their everyday clinical practice [26].

Similar research has shown that the primary barrier to nutrition counseling among physicians is a lack of expertise. There is a clear connection between doctors' confidence in their nutrition knowledge, communication skills, and their provision of nutrition care [27]. These findings suggest that a physician's engagement with nutrition education is largely shaped by their understanding of the subject. Therefore, promoting nutritional knowledge and enhancing communication skills is critical to improving the quality of nutrition care provided. Physicians should be encouraged to participate in continuing medical education on nutrition, trained in counseling methods, and required to answer nutrition-related questions on board and licensure exams, with a minimum passing score [11].

Future research should focus on improving physicians' nutrition knowledge through changes in medical school curricula related to nutrition and nutritional education. Continuing professional development through medical education interventions could increase the frequency of nutrition care and improve patient outcomes [28].

Conclusion

Although primary care physicians noted limited access to nutritional care, both in terms of visit frequency and duration, they felt competent in offering nutritional guidance to patients with diet-related health issues. To enhance their ability to provide effective nutrition care, it is crucial to implement measures that advance their nutritional knowledge and skills. Reaching a consensus on the required level of nutrition expertise would be beneficial for shaping ongoing medical education and the curriculum in medical schools.

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