Is the Current Status of Nutrition Education in U.S. Medical Schools Enough to Combat the Burden of Chronic Disease?

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Abstract

As the United States and other industrialized countries are becoming overwhelmed by the burden of chronic diseases, it is up to health care and public health professionals to determine cost-effective, population-wide solutions beyond just medical management of symptoms. Primary care physicians are some of the most appropriate people to address this problem, working on the front lines of medicine. Physicians, however, are not well educated on topics of preventive medicine and nutrition during their years of training. The National Research Council (1985) recommends 25-30 hours of nutrition education in medical school. Many studies have been conducted to show that our medical schools do not meet these recommendations (Adams, Butsch, & Kohlmeier, 2015). Barriers to increasing nutrition education include lack of time, lack of faculty who are knowledgeable about nutrition, and increasing demands to add new information about emerging medical technologies and treatments (Torabi, Rao, Jay, & Olcott, 2011 and Kohlmeier & Zeisel, 2010). A deficit in nutrition education has been a historical pattern in medical school training (High, 1958 and Frantz, Munroe, McClave, & Martindale, 2011) but several attempts have been made over the years to provide more nutrition education to students and there have been benefits to doing so. Teaching physicians how to counsel patients on nutrition early on in their training translates to greater confidence and ability to address these matters in clinical practice (Conroy, Delichatsios, Hafler, & Rigotti, 2004), and may prove to be an important opportunity for physicians to combat the chronic disease epidemic.
Introduction

It’s no secret that lifestyle-induced chronic diseases are testing the sustainability of our humanity. The CDC reports that in the United States alone, half of all adults have one or more chronic diseases. Out of the ten leading causes of death in our country, seven are due to chronic medical conditions. Heart disease and cancer, alone, account for an astounding 48 percent of all deaths among our adult population. The costs associated with treating and managing heart disease, strokes, cancer, type 2 diabetes, and arthritis add up to around a trillion dollars annually, and are expected to increase (CDC, 2015). Since the U.S. ranks 37th in health care out of all industrialized countries, we have little to show for being the nation that spends the most money on it per capita (Murray, Phil, & Frank, 2010). These exorbitant costs further illustrate the unsustainable nature of our health care system, as long as we continue with the status quo for chronic disease management.

Perhaps the most disappointing part of all this is that most chronic medical conditions could be preventable. Moreover, and unfortunately not well understood by the general medical community, is that a substantial amount of evidence-based literature indicates that these conditions are oftentimes reversible by identifying the lifestyle-related causes of chronic conditions and working with patients to correct them (Martin, Marchlewicz, & Qualls, 2016). Counseling patients on how to prevent and reverse chronic diseases by changing lifestyle factors such as nutrition, physical activity, and smoking has become a critically important skill for health care providers and an effective tool to combat chronic diseases.
It seems appropriate that any patient wanting to reevaluate their dietary habits, or simply explore ways to live longer and prevent chronic diseases, should be able to acquire this information and counseling from their primary care physician. It also seems common sense that physicians should receive adequate training in order to address any situation where nutrition might improve clinical outcomes or help a patient achieve their optimal health. Medical school is the ideal time to begin training physicians about designing and promoting lifestyle interventions for patients either diagnosed with, or at risk of developing, chronic diseases. Is the current amount of nutrition education in medical schools enabling physicians to provide appropriate nutrition counseling in clinical practice?

**Literature Review**

**Current Status of Nutrition Education**

The National Research Council’s (NRC) Committee on Nutrition in Medical Education has recommended for over thirty years that all medical schools provide at least 25-30 hours of nutrition education to physicians in training (National Research Council, 1985). Four consecutive studies have been conducted to evaluate whether U.S. medical schools meet these recommendations. During each study, researchers emailed surveys to administrators at 133 U.S. medical schools. The respondents were asked to quantify the amount of nutrition training in their curricula. The study was repeated in four-year increments beginning in year 2000, and most recently in 2012. The results of the four studies determined, as a whole, that our medical schools have not come close to reaching
this recommendation. Total hours of nutrition training averaged 20.4, 22.3, 19.5, and 19.0, consecutively. As of 2012, only 29% of schools provided at least 25 hours of nutrition education, the minimum amount recommended by the NRC, in their curricula. The average number of hours of nutrition education has actually declined from a peak of 22.3 hours in 2004, to 19 hours in 2012 (Adams, Butsch, & Kohlmeier, 2015).

The series of studies described above are useful for providing an overview about the trends in nutrition education as a whole, but perhaps not quite specific enough because “nutrition” can mean various things. In fact, other studies have shown that most nutrition education in medical schools is actually taught in the context of complex biological pathways of metabolism and/or pathology on a cellular or molecular level, which is largely not relatable to counseling patients on appropriate dietary habits or designing patient intervention scenarios (Torabi, Rao, Jay, & Olcott, 2011).

Torabi, Rao, Jay, and Olcott (2011) analyzed the viewpoints of medical school administrators regarding nutrition education. Questionnaires were sent to academic administration departments at 129 U.S. medical schools. Unfortunately, only 28 schools responded. Blind data provided by the American Association of Medical Colleges (AAMC) was utilized as a supplement for the 101 schools that did not respond to the survey. Results from both sets of data revealed that over 99 percent of administrators found diet and nutrition education either relevant or extremely relevant to medical school curricula. However, only 17.86 percent felt that their students were appropriately knowledgeable about matters regarding nutrition and diet. In addition, only 21.43 percent of administrators felt that their students received an appropriate amount of training in matters of diet and nutrition.
Another issue fueling lackluster nutrition education in U.S. medical schools is that schools themselves are not well equipped with the appropriate faculty to present this type of information. A study involving 126 medical schools in the United States found that only 8 had a department specifically dedicated to nutrition education. Of the remaining schools, 31 had another department or division that included some nutrition education. Others listed medical specialties that often require some type of nutrition counseling with certain patients, such as endocrinology or gastroenterology (Kohlmeier & Zeisel, 2010).

History of Nutrition Education

Unfortunately, throughout the history of medical training, physicians have typically been left to fend for themselves in terms of acquiring knowledge about nutrition and preventive medicine, beyond recommended screening measures for early detection of diseases. This gap in training appears to come from a tradition spanning more than sixty years, where medical schools continuously neglected to incorporate nutrition into the curricula. In 1958, a survey regarding nutrition in medical training was conducted by Dr. Edward High, of the Medical College of Nashville. Dr. High contacted 66 U.S. medical schools to inquire about nutrition education. Of the 91 percent of schools that responded to his survey, most nutrition topics were integrated into other subjects, such as biochemistry and internal medicine. Only 12 schools offered a specific nutrition course, with an average of 21 hours of content (High, 1958).

In the 1980’s, three publications attempted to change the perception of nutrition education in medical schools. These publications reported findings from the Southeastern Medical School Cohort, which was formed to evaluate the level and
perception of nutrition training at 11 different schools in the United States. A standardized, mandatory survey and examination were administered to the graduating medical students. Of the 11 participating schools, 85 percent of students indicated they were not satisfied with nutrition-related aspects of their medical training. The examination also uncovered significant variation among students with respect to competency in nutrition. A reason for the variance was thought to be the lack of a standardized nutrition curriculum in all medical schools (Frantz, Munroe, McClave, & Martindale, 2011).

Due to the results of these publications, the University of North Carolina at Chapel Hill was awarded a grant in the 1990’s to design a standardized nutrition curriculum for medical schools. This curriculum was made available (and currently still is) to all allopathic and osteopathic medical schools in the U.S. (Frantz, et al., 2011). Based on the first study by Adams, Butsch, and Kohlmeier (2000), only 55% of 120 medical schools surveyed had established any plans to utilize this curriculum.

**How is Current Nutrition Training Reflected in Clinical Practice?**

A randomized questionnaire was sent to 2,250 primary care physicians of various patient care settings, geographic regions, and patient populations. Researchers wanted to evaluate how much time physicians spent counseling patients on nutrition, as well as quantify the amount of patients who received it. For physicians who provided little or no nutrition counseling, researchers also wanted to identify any potential barriers. Of the 1,103 physicians who responded, over 66 percent provided dietary counseling for less than 40 percent of their patient population. They also spent 5 or fewer minutes, per
patient, when discussing the topic. Despite these statistics, nearly 75 percent of the respondents felt that dietary counseling was the physician’s responsibility. Perceived barriers to providing adequate dietary counseling included lack of time, non-compliant patients, lack of educational tools, lack of knowledge and adequate training in matters related to diet, and lack of physician confidence (Kushner, 1995).

Studies show that providing training and clinical opportunities for medical students to learn about nutrition counseling does make a difference in improving physicians’ confidence and preparedness in this area of preventive medicine. In 2003, Harvard Medical School required their second year medical students to take a 28-hour course on preventive medicine and nutrition. Conroy, Delichatsios, Hafler, and Rigotti (2004) evaluated how Harvard’s students felt when addressing these topics with patients before and after taking the course. Over 100 participating students were provided a 43-item anonymous survey. Results showed significant improvement in students’ confidence when addressing matters of preventive medicine. Interestingly, it was also discovered that 87 percent of students indicated they had become more aware of their own food choices, and 72 percent had made positive changes to their own dietary habits after completing the course. This study demonstrates that receiving nutrition training early on improves physicians’ confidence when providing counseling in clinical practice. It also highlights the importance of educating physicians to reflect on their own diet choices and potential risk factors for chronic diseases. If physicians were taught ways to evaluate and modify their own risk factors, perhaps it could be used as a helpful tool when counseling patients about theirs.
Would More Nutrition Education Affect Population Health?

A community-based health promotion project was conducted in a rural area of Louisiana. For three years, weekly counseling sessions were provided to 159 participants aged 65 and older. During weekly sessions, participants received nutrition screenings, point-of-testing counseling, and group exercise and diet counseling. Researchers measured relationships between baseline dietary habits, frequency of attendance at weekly sessions, and chronic disease risk factors including food choices, body mass index (BMI), blood pressures, blood glucose levels, and levels of total and LDL cholesterol. Participants saw significant improvement in BMI ($p \leq 0.001$), LDL cholesterol ($p \leq 0.03$), blood glucose ($p \leq 0.03$), and diastolic blood pressure ($p \leq 0.045$) if they received point of testing counseling at three or more sessions. (Walker, Murimi, Teonsoo, Hunt, Erickson, & Strimbu, 2012). The parameters of this study provide an ideal environment for patients, including weekly sessions, group support, consistent counseling, and regular follow up on measurable outcomes. In a typical clinical environment, these services would be much more difficult for physicians to provide, but this study does highlight the benefits of regular nutrition and diet counseling in terms of reduced risk factors for chronic diseases. It also suggests that physicians have the potential to help patients correct risk factors and prevent diseases through regular counseling and follow up.

Chapter 44 in the book *Disease Control Priorities in Developing Countries* discusses in detail the relationship between lifestyle factors and development of chronic diseases. Several areas of important dietary advice are identified, including replacing
sugary foods and beverages, refined grains, sodium, and unhealthy fats with fruits and vegetables, healthy fats, and whole grains. The chapter suggests that encouraging patients to adopt these dietary habits correlates to reduced risk of developing chronic diseases such as heart disease, obesity, cancer, and metabolic syndrome. This data further highlights the relationship of dietary habits to chronic disease risk factors. It indicates there is an opportunity for physicians to help patients achieve and sustain better health by providing counseling on these matters (Willett, Koplan, & Nugent, 2006).

A meta-analysis of research ranging from 1966 to 2001 evaluated effectiveness of dietary counseling in primary care. A total of 21 studies were utilized in this review. Criteria for inclusion were randomized, controlled trials lasting at least 3 months. The studies measured diet habits of patient populations typically found in primary care practices. Researchers analyzed the magnitude of effect, intensity of intervention, patient risk level, and use of well-proven counseling techniques in each study.

It was found that the extent of changes made by patients was related to the length and intensity of their diet interventions. Consumption of saturated fat decreased, while consumption of fruits and vegetables increased slightly with diet counseling. Some interventions utilized alternative communication strategies, such as computer-generated telephone or mail messages. These alternatives were found to be moderately effective in altering dietary habits as well (Pignone, Ammerman, Fernandez, Orleans, Pender, Woolf, Lohr, & Sutton, 2003). Further studies are needed to examine how this type of counseling translates to chronic disease outcomes and long term population health.
Solutions for Increasing Nutrition Education

One of the perceptions about nutrition and medical school is that there is not enough available time to add more information into what is already generally thought of as an overly rigorous medical school curriculum. With the constant advances in modern medicine, the need to include the latest technologies and therapies in medical school curricula competes with the need to add nutrition education. The study by Adams, Butsch, and Kohlmeier (2015) indicated that 8 U.S. medical schools did far exceed the minimum 25-hour recommendation set by the National Research Council’s Committee on Nutrition in Medical Education. In fact, these schools have reached numbers as high as 40-75 total hours of instruction over the course of students’ pre-clinical and clinical years. This is an important statistic, because it shows it is possible to integrate nutrition education into a tight curriculum. Furthermore, Adams, Butsch and Kohlmeier (2015) also reported that students themselves are beginning to seek out this information on their own. For example, the Nutrition in Medicine project receives numerous inquiries from students across the country who are interested in gaining access to the modules in order to pursue them on their own time. Providing students with appropriate supplemental tools and incentives to learn about nutrition on their own, according to their individual schedules, could be useful in increasing the overall amount of nutrition training in medical school.

Another issue to be considered is that of medical schools not having qualified faculty to teach students about nutrition as it relates to chronic diseases. A potential interim solution could be to have students learn through a standardized multimedia program instead of in-person lecturing. A study in the late 1990’s evaluated the use of a
multimedia nutrition education program at one medical school, within an ongoing course about primary care. The multimedia program, titled "Cardiovascular Health: Focus on Nutrition, Fitness and Smoking Cessation" introduced topics related to health promotion and disease prevention in everyday practice. The program featured 18 video segments in which students observed physicians assessing and counseling patients and managing cases. They also answered multiple-choice questions assessing what they learned.

Students were taught motivational interviewing techniques ranging from basic nutrition screening, to quick counseling sessions, to detailed assessments and in-depth counseling. They were also required to complete one “clinical challenge section,” which allowed students to design a diet and/or exercise intervention based on a simulated patient chart. The video training was combined with faculty-led discussion groups, as well as opportunities to practice with standardized patients.

Researchers evaluated students' use, level of interest, and satisfaction with the program. All 72 students completed the mandatory clinical challenge and passed. Students indicated an average of 2 hours spent using the video software, with a range from 30 minutes to nearly 5 hours. The multimedia approach was found to be acceptable to first-year medical students. Respondents indicated they would recommend the program to other students and some students also visited areas within the program that were not required. Students indicated that they particularly liked having an opportunity to watch physicians assess and counsel patients about nutrition in the office setting. Importantly, trained observers also reported that students’ ability to provide nutrition assessments and counseling for standardized patients had improved from baseline levels (Kolasa, Jobe, Clay, & Daugherty, 1997).
The Nutrition in Medicine online curriculum created by UNC Chapel Hill and/or similar programs have been a positive step forward in finding an approach that addresses many of the barriers to increasing nutrition education in medical school curricula. They provide an efficient, standardized curriculum; alleviate the need for specialized nutrition faculty; and enable students to learn on their own time if they choose.

**Conclusion:**

Physicians in training are not well educated about the relationship of proper nutrition and the development of chronic conditions. They are not provided the tools or guidance in medical school in order to feel confident about designing appropriate nutrition interventions for patients in clinical practice. While studies show that both students and administrators are aware of the deficit, on a nationwide level, nothing seems to be done to address it. This is an important issue that deserves more attention, because primary care physicians are on the front lines, working every day with the very people who need this type of counseling. It is time for medical schools to start taking nutrition education more seriously.

**References:**


