

## **Survey of Nutrition Education in U.S. Medical Schools – An Instructor-Based Analysis**

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**Abstract - Background:** Recent reports on the state of nutrition in U.S. medical schools suggest that these schools are challenged to incorporate nutrition into an already full curriculum.

**Objective:** The aim of this study was to determine the current state of nutrition education in US medical schools based on information reported by individuals responsible for teaching nutrition to medical students.

**Design:** Between July 1999 and May 2000, we surveyed 122 U.S. medical and osteopathic schools. The survey was mailed to the nutrition educator at each institution; recipients could return the survey via mail, fax, or the web.

**Results:** The majority of the 98 medical schools responding to the survey provided nutrition education. In 90% of responding U.S. medical and osteopathic schools (representing 88 of 98 schools and over 65% of all institutions), all students were guaranteed exposure to nutrition. An average of  $18 \pm 12$  hours of nutrition was required, including material integrated into other types of courses.

**Conclusions:** Our findings indicate that nutrition education is an integral part of the curriculum of the majority of US medical schools surveyed. A number of medical schools have chosen to incorporate nutrition education into already established basic science and clinical courses.

**Key Words** -Medical education, nutrition education, computer-assisted instruction, curriculum, medical students, nutrition teaching, nutrition in medicine.

### **Introduction**

Nutrition plays a critical role in numerous pathophysiological conditions, including such prevalent diseases as diabetes, cancer, and cardiovascular disease.<sup>1,2</sup> Despite the recognition that physicians are often called upon to provide guidance in nutritional aspects of disease and disease prevention,<sup>3,4,5</sup> nutrition has not been consistently emphasized in medical school curricula. Indeed, numerous reports suggest that nutrition education of physicians remains inadequate.<sup>5,6</sup> A 1997-1998 analysis of data provided by the Clinical Administrative Data Service of the Association of American Medical Colleges (AAMC) found that only 33 accredited U.S. medical schools (26%) had a required nutrition course.<sup>7</sup> Other reports on the status of nutrition in medical education have presented a similar picture.<sup>8,9</sup> Over the years, such reports have

led to frequent calls for increased emphasis on, and reform of, nutrition education of physicians.<sup>1,7,9-14</sup>

In response to the limited access to nutrition education in U.S. medical schools, our team at the University of North Carolina at Chapel Hill created a series of interactive multimedia CDs to educate medical students on the basic principles of nutritional biochemistry. They also provide the opportunity for students to apply those principles to a virtual patient case. The Nutrition in Medicine® (NIM) CDs were designed to take advantage of computer-assisted instruction in medical education, and were distributed to 122 medical schools for which we had instructor contact information.<sup>15,16,17</sup>

Based on the contacts established through the distribution of the NIM CDs, we conducted a survey of these 122 schools. They included 114 allopathic and 7 osteopathic schools. A podiatry school was

included because they had requested and received a mailing of NIM disks. The survey was designed to assess the progress of nutrition education in U.S. medical and osteopathic schools. We were particularly interested in quantifying the hours of nutrition instruction that are incorporated into non-nutrition courses. Historically this instruction has been poorly documented. To enhance the reliability of the survey, information was gathered directly from individuals involved in the development and/or implementation of the nutrition curriculum.

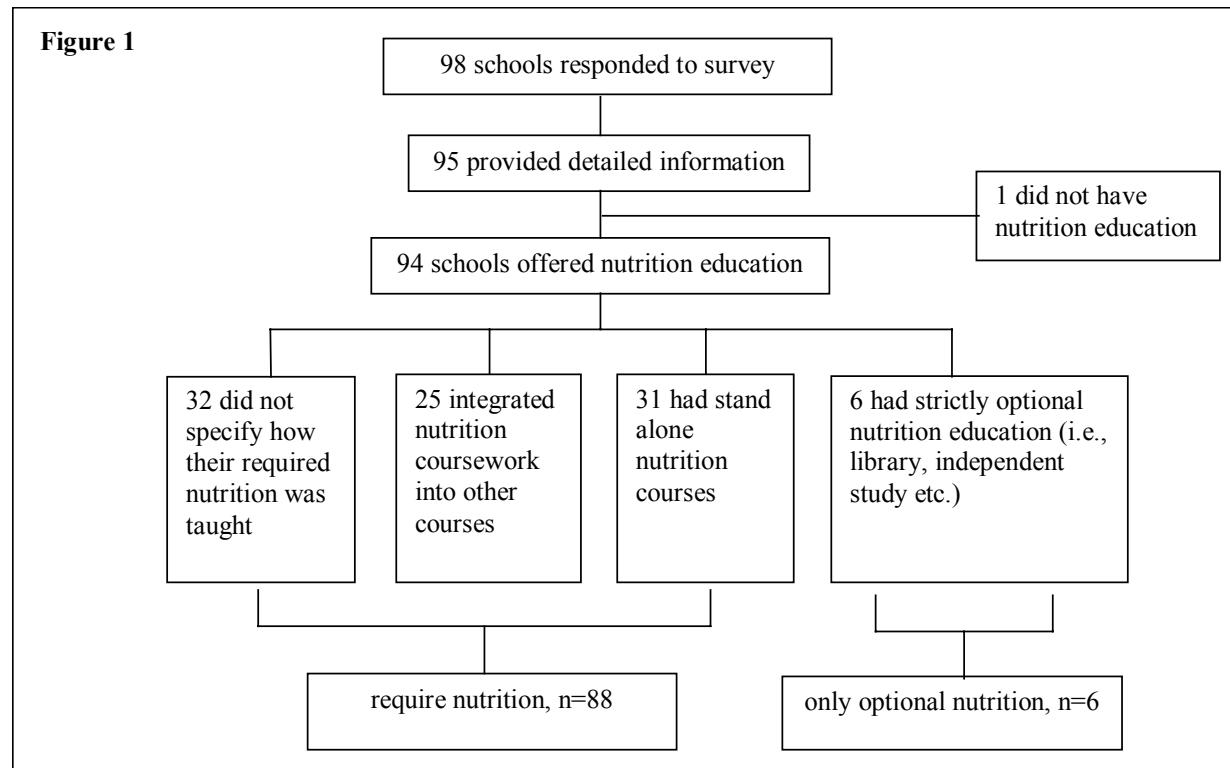
## Methods

The 1999-2000 NIM survey was mailed to 122 U.S. medical and osteopathic schools for which we had nutrition instructor contact information. These included 114 of the 129 accredited U.S. medical schools (88%) listed in the *Directory of American Medical Education 1998-99*<sup>18</sup> and 7 of the 19 accredited U.S. schools of osteopathy (37%). When

hours of required course time that nutrition was taught and to name the course or courses in which nutrition instruction was provided. This information was used to determine the extent of nutrition education at each institution and to help determine if the school had a stand-alone nutrition course or if it integrated its nutrition instruction into other course types.

Recipients had the option of filling out and returning the survey via mail, fax, or the NIM web site (<http://www.med.unc.edu/nutr/nim/>). The initial survey was mailed in July 1999; a repeat mailing was sent to non-respondents in November 1999. The surveys were followed up in December 1999 and January 2000 via contacts by email, phone, and fax in an attempt to obtain one survey from each medical school. An additional subset of schools that had responded to a previous NIM survey in 1998 but did not respond to the 1999-2000 survey were again contacted in April 2000. The survey was completed

**Figure 1**



possible, the survey was sent directly to the individual responsible for teaching nutrition at that institution (called the "primary contact"); in all cases, it went to individuals who had been sent copies of NIM CDs because they were involved with the nutrition education program at their school. Among other items, respondents were asked to estimate the

on May 15, 2000, with responses from 98 of the 122 medical schools included in the original mailing, yielding a response rate of 80%. When several individuals at a single school filled out a survey, the data provided by the primary contact was used in the analysis. If the primary contact at a school did not

return a survey, the data provided by another individual was used.

A Common Gateway Interface (CGI) script was used to process data from surveys submitted over the web site ( $n=32$ ) into a database. Surveys submitted in other formats ( $n=65$  by hard copy paper form; one school provided verbal information only) were entered via the web-based form by one of the authors. The resulting log file was then converted into a spreadsheet file. Descriptive statistics were computed for all study variables (means, standard deviations and percentiles for continuous variables, frequencies and proportions for categorical variables). All statistical computations were done using SAS v8.1 (SAS Institute Inc, Cary, NC).

## Results

We found that nearly all medical schools surveyed provided nutrition education (Figure 1). Of

including biochemistry, physiology, or as part of clinical practice or clerkships (Table 1). The six schools that had only optional nutritional coursework provided nutrition education through elective courses, seminars, lectures, clerkships, and independent study.

At schools where nutrition education was required ( $n=88$ ), the mean number of hours of nutrition education per student (estimated by respondents) was  $18 \pm 12$  hours. However, there was great variation, with five schools requiring over 40 hours and 25 schools requiring 10 hours or less (Figure 2).

## Discussion

In contrast to prior reports documenting the poor and slowly changing status of nutrition education at the 129 U.S. medical schools,<sup>5,6,7,8,9,14,19</sup> we found that the vast majority of respondents (94/98) do provide some type of nutrition education. Indeed, at

**Table 1**  
**Courses in which nutrition is taught by schools requiring nutrition education.\***

Nutrition	31	55.4%
Biochemistry	7	12.5%
Pathology/Pathophysiology/Physiology	3	5.4%
Integrated curriculum	11	19.6%
Clinical practice, including clerkships	4	7.1%

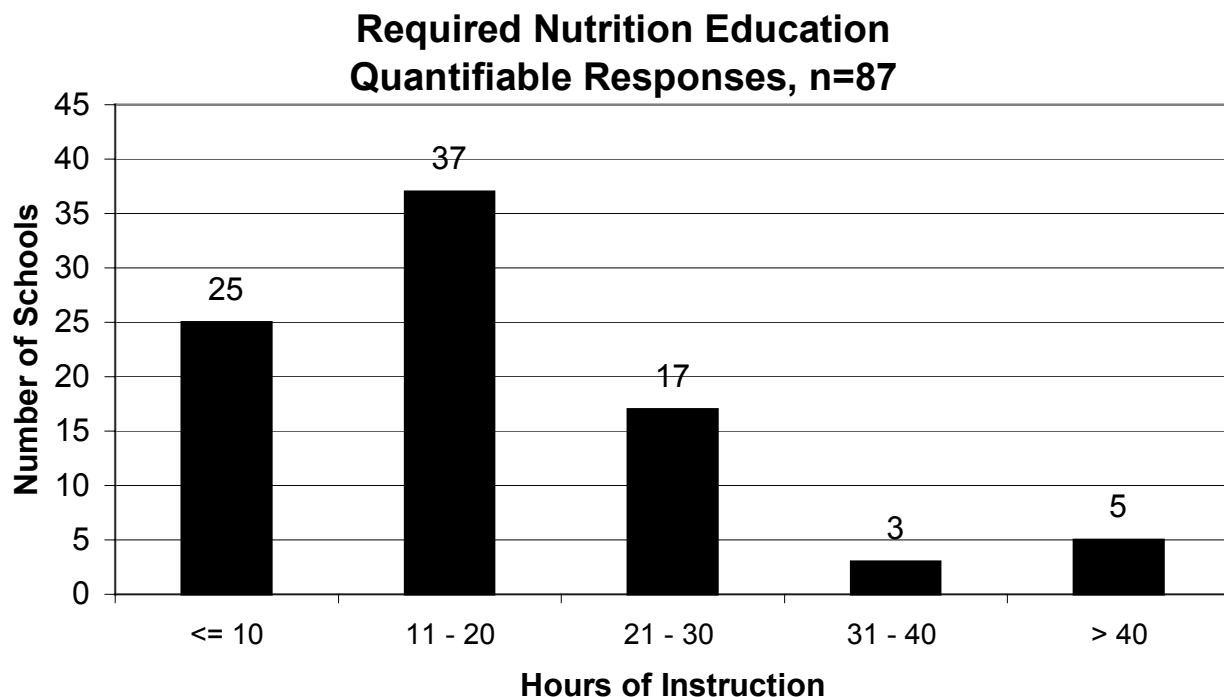
\*specified by 56/88 respondents

the 98 responding institutions, 95 gave quantifiable descriptions of their methods for teaching nutrition. In 88 of these schools (90%), students were guaranteed exposure to nutrition, either as a mandatory separate nutrition course or as component of a required course not specifically designated as "nutrition" (i.e., biochemistry). Six schools (6%) offered only optional nutrition education, and one school (1%) did not teach nutrition. In the 94 schools where nutrition education was provided (88 required + 6 strictly optional), the methods of instruction varied widely (Figure 1). Of the 88 schools requiring nutrition education, 56 identified the type of course in which nutrition was taught (Table 1). Slightly more than half of those responding (31/56) offered a stand-alone nutrition course (e.g., Nutrition and Metabolism, Human Nutrition). The remaining institutions (25/56) integrated nutrition into a diverse array of courses,

most of these schools (88/98), exposure to nutrition is required as part of the curriculum.

One reason our results may differ from prior findings is because our survey included assessment of hours of required nutrition instruction that are incorporated into other courses. Gathering this information was facilitated by establishing direct contacts with key individuals responsible for nutrition education at each institution.

To our knowledge, this is the one of the few surveys of its kind in the past 15 years to obtain data directly from the instructor who is involved with nutrition education. Other reports of curriculum offerings rely heavily on information from databases (e.g. CurrMIT system version 2.3) which may be voluntarily entered by an administrator and not solicited from the person actually providing the



**Figure 2:** Quantitative responses, n=87, of the 88 schools requiring nutrition education (one did not provide the number of hours taught).

instruction. A strength of our survey is that the response rate was high; the survey was mailed to 88% of all U.S. medical schools, and 80% of those responded. The survey indicates that at least 88 schools are requiring nutrition instruction; the actual numbers may indeed be higher. A limitation of this study is that the respondents are a self-selected group that may have a greater interest in nutrition education than individuals at schools who did not respond to the questionnaire. It is also possible that, realizing our questionnaire came from a group with nutrition education integral to its mission, respondents may have exaggerated their nutrition offerings. We have no evidence to suggest that this occurred, and we attempted to minimize this type of bias by asking schools to specifically report the course name and number in which nutrition is taught.

Among the respondents that provided information on the course type in which nutrition is taught, almost half indicated that required nutrition education is provided in classes that are not specifically designated as “nutrition” courses. Whether or not this is the best way to provide

nutrition instruction to medical students, this variety of instruction reflects the importance of integrated curricular approaches to nutrition education, and reflects the evolving trend toward multidisciplinary curricula in US medical schools. Educating medical students is a crucial first step if the U.S. is to have a community of physicians who are knowledgeable about nutrition and the important role it plays in the prevention and treatment of chronic diseases such as diabetes, obesity, cardiovascular disease, and cancer. Adequate nutrition education for students, in addition to the availability of physician nutrition role models, will improve the public’s health over the long-term.

Overall, the results of our survey suggest that there is great diversity in the provision of nutrition education to medical students in the United States. Based on data garnered directly from individuals responsible for teaching nutrition to medical students, 90% of responding US medical schools reported a requirement for nutrition education. Our unique instructor-based survey allowed us to identify and quantify methods of nutrition instruction that have previously been unaccounted for. The degree to

which nutrition education is provided in US medical schools demonstrates flexibility in incorporating nutrition education into an already full medical school curriculum.

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