Raising Medical Students’ Awareness of Nutrition and Fitness in Disease Prevention: Nutrition and Fitness Program at the University of Iowa

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Abstract: At the University of Iowa we devised a learning experience, called the Nutrition and Fitness Program, for third-year medical students. The program was designed to raise awareness of the role of nutrition and exercise in the prevention and treatment of disease. Students spent one afternoon learning about their personal health risk factors, such as body mass index, percent body fat, other anthropometric measures such as waist, hip and mid-arm circumference, blood lipids, bone-mass density, dietary analysis, and fitness assessment. Students spent another afternoon visiting the cardiac rehabilitation center. At the end of each rotation, students gathered for a heart-healthy meal that served as a focus for a discussion with dietitians about important nutrition issues.

Good nutrition is an important component in establishing a healthy lifestyle and in preventing major chronic diseases that commonly affect Americans today. Although a majority of medical schools include nutrition as part of their curriculum, research shows that practicing physicians are not transferring this knowledge into their clinical practice. The public health implications of this deficit in the practical application of nutrition principles continue to grow as the prevalence of overweight and obese individuals increases. There is a strong association between physicians’ personal dietary behavior and their ability to counsel patients about their diet. Because of this, physicians are uniquely positioned to influence their patients’ health behaviors. We believe that by working with students to help them modify and improve their own eating behaviors, we will be increasing the likelihood that they will internalize the importance of nutrition. Thus, as physicians, they will be more likely to address nutrition issues with their patients. If nutritional status becomes an important part of patients’ medical evaluation and treatment plans, costly medications and medical procedures will decline, resulting in improved overall cost effectiveness in our health care system.

At the University of Iowa we have devised a learning experience that is part of the Outpatient Internal Medicine Clerkship, a required course for third-year medical students. This experience, called the Nutrition and Fitness Program, has now been in place at the University of Iowa for three years. The program is designed to raise awareness and understanding of the role of nutrition and exercise in the prevention and treatment of disease. It also provides medical students with the opportunity to learn more about their own personal health risk factors.

Structure and Methods

Third-year medical students at the University of Iowa participated in the two-day Nutrition and Fitness Program within their Outpatient Internal Medicine Clerkship. All students at the Iowa City campus rotated through the program over the course of the
year, in groups of 4-10. The program has been ongo-
ing for three years, allowing for continuity as well as
regular improvement based on comments from the
students’ evaluations.

This program was not a research project but an
educational program, as determined by the Institu-
tional Review Board (IRB). Although students were
not required to participate, the overwhelming major-
ity chose to do so. Students were informed that they
could choose not to take part in any of the specific
tests or could stop participating in these tests at any
time. Refusing the medical and physiological tests
would not adversely affect their grade and the course
director did not have access to any medical data
through this course. Data from measurement of vitals
(height, weight, blood pressure, and resting pulse),
blood lipids, and DEXA, were entered into the stu-
dents’ permanent medical records because they were
performed by GCRC hospital staff; students were
informed that they should request not to have these
tests performed if they did not wish to have this in-
formation included in their charts. Students were
also offered the opportunity to have any of their val-
ues removed from the group aggregate data.

Facilities & Schedule

All activities were carried out in the University
of Iowa Hospital and Clinics (UIHC). Students di-
vided their time between the General Clinical Re-
search Center (GCRC) and the Cardiovascular
Health, Assessment, Management and Prevention
Services (CHAMPS) within UIHC.

Each rotation of third-year medical students was
divided into two groups. One group spent the after-
noon going through a series of self-assessment sta-
tions in the GCRC while the other group visited
CHAMPS. The following afternoon, the two groups
switched places. At the end of the second afternoon,
the two groups joined in the GCRC for a dinner and
nutrition discussion roundup.

GCRC Activities - In the morning, students
came to the GCRC nurse’s station to have their fast-
ing blood drawn for lipid screening and their vital
statistics (blood pressure, resting pulse, height,
weight) measured. They returned to the GCRC in the
afternoon to participate in a series of stations de-
signed to help them assess their nutrition and fitness
risk factors. The GCRC activities were as follows:

• **Blood Lipid Analysis** - Following a 12-hour
  fast, nurses took a 15ml venipuncture blood
draw for a lipid profile of each student.

Blood samples were analyzed for total cho-
esterol, HDL-cholesterol, LDL-cholesterol,
and triglycerides. Results of the lipid analy-
sis were discussed individually with a dieti-
tian during the counseling session later the
same day.

• **Dual Energy X-ray Absorptiometry
  (DEXA)** - We provided students with the
opportunity to have a DEXA scan performed
by the UIHC DEXA technician. Full body
and left hip scans provided information
about percent body fat and bone mineral
density. Students received a printout of their
DEXA results in which the specific informa-
tion typically reported to a patient’s physi-
cian was emphasized.

• **Anthropometry** - Fully qualified and ex-
perienced GCRC staff performed anthro-
pometric analyses on each student individu-
ally in a private room. Skin fold measure-
ments were taken in three sites: triceps,
chest, and sub-scapula for men; triceps, su-
per-iliac, and abdomen for women. Students
received information about their body mass
index (BMI), percent body fat, as well as
waist, hip, and mid-arm circumference.

• **Dietary Self-Assessment** - Before coming
to participate in the Nutrition and Fitness
Program, students were given the assign-
ment of assessing their own diet: they kept a
record of everything they consumed for 1-3
days and analyzed their own food record us-
ing an online dietary assessment tool called
the Interactive Healthy Eating Index. The
Interactive Healthy Eating Index (IHEI)
website,
developed by USDA’s Center for
Nutrition Policy and Promotion, calculates
HEI scores and daily nutrient intakes for the
user, as well as providing a graphic depic-
tion of their “personal Food Guide Pyra-
mid”. The results of this dietary self-
assessment were discussed during the die-
tary counseling station.

• **Dietary Counseling** - Students had the op-
portunity to discuss dietary concerns with a
registered and licensed dietitian in an indi-
vidual consultation. Their lipid profile re-
results were discussed in context with their
dietary behaviors. Through the counseling
session, the dietitian modeled a preventive
nutritional counseling format that is typi-
Gender offers an estimated fitness level based on the participant’s gender and age.

**Fitness Assessment** - A trained staff member demonstrated to the student several materials that could be easily incorporated into medical practice to address the importance of physical activity: the Physical Activity Readiness Questionnaire (PAR-Q)\(^{10}\) and Patient Centered Assessment and Counseling for Exercise (PACE).\(^{11}\) The PAR-Q serves as a screening tool to quickly and easily identify adults for whom physical activity might not be appropriate. PACE contains a short fitness assessment, designed to be completed by a patient in a waiting room, which determines the patient’s current level of physical activity and readiness to change. It also provides three counseling protocols based on the patient’s appropriate stage of change: “not ready to change”, “ready to change” or “active” (meeting physical activity guidelines).

The staff member also assessed students’ fitness level privately, using the YMCA 3-Minute Step Test. The YMCA 3-Minute Step Test is a simple fitness assessment that can be utilized with healthy adults. The test involved stepping up and down at a 24-steps-per-minute rate for three minutes; a tape recording of the correct cadence (96 beats-per-minute) was played to assist the participant in keeping the correct pace. Following the step test, the participant immediately sat down and, within five seconds, the staff member started counting the pulse for one full minute. The score for the test, the total one-minute post-exercise heart rate, reflects the heart’s ability to recover quickly. Comparing this value with a standard chart offers an estimated fitness level based on the participant’s gender and age.

**CHAMPS Activities** - Students spent one to two hours visiting the Cardiovascular Health Assessment, Management, and Prevention Services (CHAMPS) located in the UIHC. During this visit, students had the opportunity to tour the facility and to observe what services are available to inpatients and outpatients who are recovering from heart surgery or cardiovascular disease. Students observed patients going through cardiac rehabilitation or taking classes in nutrition, stress reduction or physical activity. They had the opportunity to experience for themselves the process of a standard clinical fitness assessment on the treadmill.

**Meal and Discussion** - On the second afternoon of each rotation, following completion of all activities in the GCRC and CHAMPS, students returned to the GCRC to participate in a healthy meal, discussion, and recap of the program. GCRC staff used colorful tablecloths and decorations to transform the day room into a festive setting. Each year the GCRC kitchen staff designed a different meal, incorporating Mexican, Italian, or Mediterranean foods low in saturated fat and trans fat. The foods served as a focus for a discussion on healthy eating issues. During dinner, a pair of licensed dietitians led a group discussion that covered topics such as fatty acids in the diet, the role of phytochemicals, and recent dieting trends, all in the context of discussing nutrition issues with patients.

**Statistical Analysis** - Results from each station were provided to each student individually. Aggregate group data was also compiled.

**Student Evaluations** – Students filled out evaluations immediately after the meal and discussion in the GCRC. They rated each of the activities

| Table 1 | Student Participation in Nutrition and Fitness Program |
|---------|-----------------------------------------------------|
| Year\(^{a}\) | Gender | Number of students participating | Student Age\(^{a}\) |
| 1 | Female | 48 | 26.3 ±3.8 |
| | Male | 63 | 25.9 ±2.4 |
| 2 | Female | 44 | 26.9 ±2.8 |
| | Male | 42 | 27.6 ±5.3 |
| 3 | Female | 41 | 26.8 ±2.6 |
| | Male | 50 | 26.8 ±2.4 |

\(^{a}\)Year 1=2001-2; Year 2=2002-3; Year 3=2003-4.  
\(^{b}\)Mean age + standard deviation.
Results

Table 1 shows a summary of the number and ages of students from the first three years of the Nutrition and Fitness Program. From 2001 to 2004, a total of 288 students participated.

Figures 1 and 2 summarize the mean of three years of evaluation scores from the medical students: Figure 1 shows students’ evaluations of the value of the GCRC stations for themselves and Figure 2 shows their evaluation of the value of the stations for future use with patients. All stations were highly rated during all three years; the mean for each group of students was between 3.7 and 5 for every station. Different stations appealed to different students but, in general, students gave highest ratings to their lipid analyses and DEXA scans.

From the students’ comments on their evaluations, it appears that this Nutrition and Fitness program provided them with a much better understanding of their own personal risk factors as well as a better understanding of how to discuss practical nutrition and fitness issues with patients. They appreciated having the opportunity to learn more about their own health factors on a one-to-one basis and felt that personalizing the information made the learning more valuable. Many students thanked us for offering the program and felt it was very helpful to go through the experiences themselves to be able to counsel their future patients more effectively.

Discussion

Today Americans have access to more nutrition information through written media than ever before, especially from the Internet. As a result, the public is becoming more nutrition-conscious and is demanding reliable sources to improve decision-making about their personal health. Physicians were viewed by 70% of adults as their single most credible source of health information. Patients consistently report preventive services as a high priority for their health care and want physicians to provide nutrition counseling. Data from the three-state Health Education and Research Trial revealed that 72% of patients would like their physician to talk to them about diet, and 66% of patients would like their physician to talk to them about weight loss. Rather than being alienated by physician inquiry about lifestyle, patients expect and may even welcome it. Unfortunately, data from the 1995 National Ambulatory Medical Care Survey suggests that less than one in three adults receive diet counseling when seen by primary care providers.
Medical school is the foundation of a physician’s medical education. Recent surveys indicate that nutrition education is a part of the curriculum in the large majority of US medical schools.\(^2,15\) However, substantial inconsistencies exist in training between schools, suggesting there is great diversity in the provision of nutrition education. Torti collected data directly from individuals responsible for teaching nutrition in 98 medical schools. He reports that of the 88 schools that require nutrition, slightly more than half offered a stand-alone nutrition course. The remaining institutions integrate nutrition in biochemistry or physiology, not allowing room for a separate class to address the practical application of nutrition. Research shows that practicing physicians who studied nutrition had more favorable attitudes towards nutrition. These physicians, however, did not use clinical nutrition skills in their practice to any greater degree than those who had not studied nutrition during medical school. Medical students have long indicated that they feel their medical curriculum does not provide enough education about clinical nutrition issues.\(^16\) They have indicated that they would like to learn more about how to talk about food with their patients. The missing element is the application of the nutrition knowledge to patient care. Key barriers to conducting nutrition counseling in the physician’s office have been identified. These barriers include not enough time, inadequate nutrition training in medical school, and lack of confidence in their ability to change patient behavior.\(^17,18\) Therefore, an education that goes beyond knowledge and focuses on confidence and skill in providing nutrition services is timely.

Primary-care research and social learning theory suggest innovative approaches to integrate nutrition counseling into medical school curriculum. The social learning theory suggests that behavior change is mediated by changes in self-efficacy.\(^19\) For example, physicians who attain high levels of confidence in their nutrition counseling ability are more likely to assist their patients in making dietary changes than those with low levels of confidence. A promising way to build self-efficacy in the minimum time possible and with the least disruption of established medical programs is to increase students’ understanding of their own diet and health parameters.\(^3\) For years, experts have found association between physician personal health behavior and counseling practices.\(^20-22\) The two spheres of their personal and professional lives influence each other. Two recent studies report a strong, consistent association between physicians’ personal dietary behavior and their practice of performing nutrition counseling. In face-to-face physician surveys, Sciamanna and colleagues reported that 59% of physicians who consistently avoid high-fat foods “very often” assisted patients in making changes in dietary fat and fiber, compared to only 19% of physicians who did not personally avoid high-fat foods.\(^4\) Frank and colleagues show that physicians who have intentionally altered their diets, and thus have a higher awareness of diet, are more likely to counsel patients about nutrition and weight loss.\(^23\)
Conclusion

For the physician, narrowing the gap between the “science of nutrition” and the “application of nutrition” is critical for the provision of optimal preventive care. The literature and our work with medical students support the need and acceptance of a personalized, practical approach to nutrition education. Dietary counseling has been shown to reduce medical costs. Physicians who address risk behaviors are likely to do so with an average of 1000-2000 patients. Therefore, there is the potential for great medical cost savings when we intervene with these learning experiences with health care providers.

By offering medical students the opportunity to learn about their own personal nutrition and fitness risk factors, this Nutrition and Fitness Program appears to play an important role in the students’ medical education. In order to counsel future patients on the importance of nutrition and fitness factors, both knowledge and confidence are necessary. Programs in the medical school curriculum like this, that allow students to learn on a very individual level, provide future doctors with the tools to become better health care providers.

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