

Nutrition Education of Medical Students: Evaluating the Health meets Food Culinary Education Program versus Online Education Modules

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Background

The correlation between diet and disease has long been established (5). All-time high obesity rates in the United States are predicted to increase to 48.9% by 2030 if current trends continue (10). Unsurprisingly, cardiovascular disease, cancer, stroke, and diabetes are ranked among the highest leading causes of death (9). These have all been shown to be nutrition-related preventable diseases (7). For example, a Mediterranean-style diet can reduce cardiovascular events by 72% (3). A study of 122 physicians representing 72 medical schools reported that they feel unprepared to handle cases requiring knowledge of clinical nutrition. In this study, 94% of the physicians with prior graduate training in nutrition reported that their medical school nutrition training was insufficient (4).

The National Academy of Sciences recommends 25 hours of nutrition education in medical school. A study of 109 medical schools showed that not all medical schools provide nutrition education. Of 105 schools requiring nutrition education, only 25% provided a dedicated nutrition education course. Over the course of medical school, medical students received, on average, 19.6 hours of nutrition education (2). Another study of 133 medical schools showed that 36% of schools studied required 12 hours or fewer of nutrition education, and that 9% required no nutrition education at all (1).

Various educational models may be used to address the nutrition educational deficiency among medical schools. This includes traditional lectures, problem based learning, or hands-on learning. The multiyear prospective observational cohort study, Cooking for Health Optimization with Patients (CHOP), conducted by researchers at Tulane University, showed superiority of hands-on cooking and nutrition education compared to nutrition education alone in a sample of 627 medical students (8). In their more recent multisite cohort study, hands-on cooking and nutrition education improved 3,248 medical students' nutritional counseling competencies as well as improved student's diets (6).

At all Lake Erie College of Osteopathic Medicine (LECOM) campuses, nutrition education is required during and integrated into the pre-clinical years. For example, biochemistry covered information regarding metabolic processes, physiology related dietary restrictions for certain patient populations, and genetics conveyed nutritional needs for patients with inborn errors of metabolism. In total, these biochemistry, physiology, and genetics nutrition-related readings represented less than 10 hours of nutrition education. LECOM-Bradenton provides an 11-hour dedicated nutrition education course.

Introduction

To directly address the nutrition education deficiency the Goldring Center for Culinary Medicine (GCCM), part of Tulane University School of Medicine, designed an expansive nutritional education program for medical students now called 'Health Meets Food' (6). It also provides an efficient and seamless conduit through which medical schools can integrate a dedicated nutrition education program. The GCCM program includes 28 hours of instruction delivered over 8 modules. Each module consists of a 30-minute online lecture video, 1.5 hours of hands-on cooking, and a 45-minute post-cooking problem-based learning session during which participants eat their nutritious meals.

Health Meets Food is implemented at Arnot Ogden Medical Center (AOMC). The program serves as a continuation of the CHOP study. It also aims to provide a dedicated nutrition education course to LECOM students, from all 3 campuses, rotating at AOMC during their clinical years. While there are over 600 third year LECOM students, only 47 of them are currently rotating at AOMC. In an effort to make Health meets food more accessible, while also providing a ubiquitous cross-campus dedicated nutrition course to LECOM students, we sought to explore the efficacy of an online curriculum only GCCM program: Nutrition Teaching Day.

Objective

This ongoing 2-year prospective cohort pilot study evaluated changes of nutrition knowledge in medical students completing the GCCM curriculum with hands-on cooking (Health meets food program), versus the GCCM online curriculum only (Nutrition Teaching Day).

Methods

During the 2018-2020 years a cohort of 47 third-year LECOM students completed the Health Meets Food program while a second cohort of 57 third-year LECOM students completed Nutrition Teaching Day.

To assess baseline nutrition knowledge, all cohorts completed a baseline nutrition knowledge assessment as well as the CHOP research-validated survey at:

https://tulane.co1.qualtrics.com/jfe/form/SV_bNt5yLzUgPJfm9T.

The baseline nutrition knowledge assessment was composed of all 115 module quiz questions. To assess nutrition education gained in the Health Meets Food program versus Nutrition Teaching Day, all cohorts completed 8 individual quizzes pertinent to each module and once again completed the CHOP survey.

The Health Meets Food program included 8 modules of hands-on cooking classes, problem-based learning sessions, and the GCCM online education curriculum. The 28 hours of education in Health Meets Food spanned 8 individual weekly sessions. Module videos were viewed before or after attending the corresponding hands-on cooking session. Students were given a week to complete the respective module's quiz. 8 individual cooking sessions were completed together with subsequent discussion of the module's respective problem based learning.

Nutrition Education Day consisted of the GCCM online education curriculum alone, without hands-on cooking and problem-based learning sessions. This totaled 8 hours of instruction over 2 days.

End-points collected included baseline nutrition knowledge assessment, quiz grades of modules 1-8, and the average of total module quiz grades. End-points were analyzed with a two-sample t-test assuming equal variances.

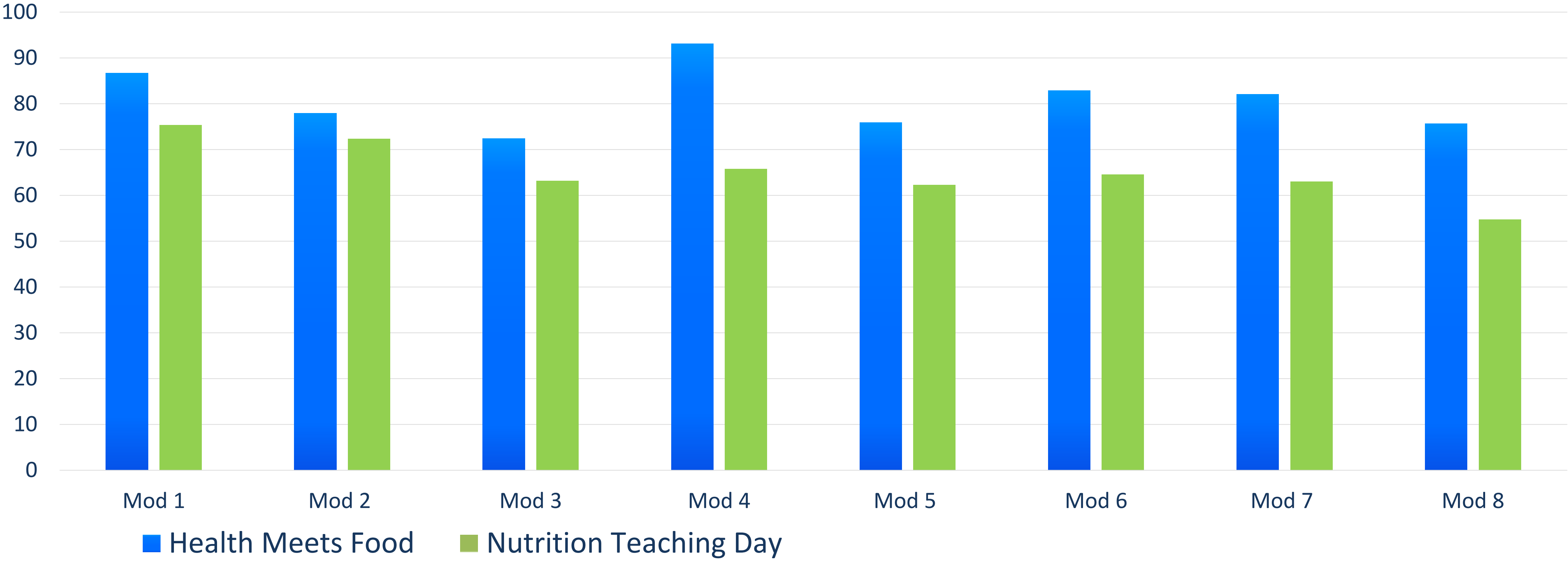
Results

The average baseline assessment score (Graph 1) for students that completed the Health Meets Food program was 47.93% correct and 40.64% correct in students that completed the Nutrition Teaching Day program. The difference between these two averages was statistically significant, with a p-value of <0.001.

The average post-program score, calculated by averaging the scores from modules 1 through 8 (Graph 2), was 80.24% correct in the Health Meets Food program and 64.69% correct in the Nutrition Teaching Day program. The difference between these averages was statistically significant, with a p-value of <0.001.

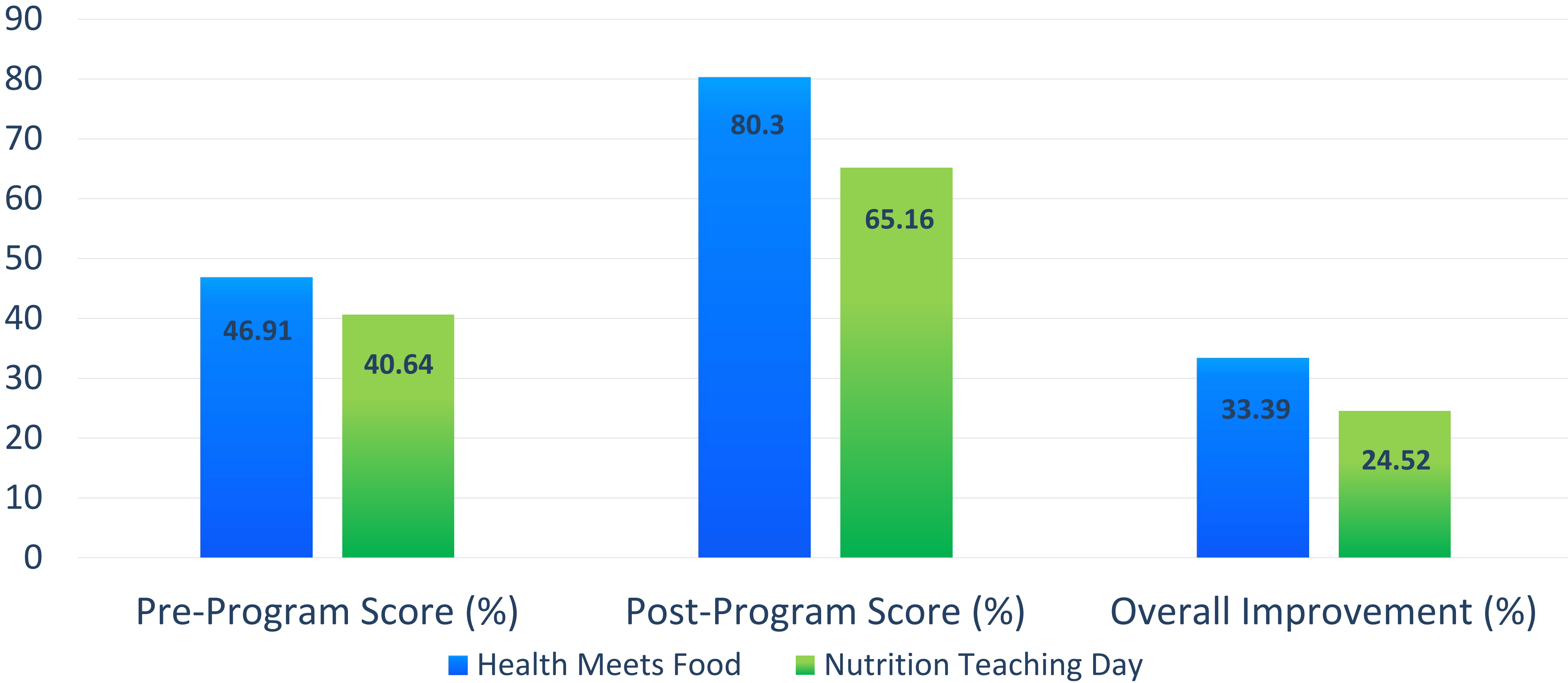
The average improvement, calculated by taking the difference between the post-program score and the baseline assessment score, was 31.34% for the Health Meets Food program and 23.45% for the Nutrition Teaching Day program. The difference between these averages was statistically significant, with a p-value of 0.001.

Average Module Quiz Scores (%)



Graph 2. Average module scores of students who completed the Health meets food class or Nutrition Teaching Day.

Overall Average Scores Pre- and Post- Nutrition Education Programs



Graph 1. Average pre-program and post-program scores of students who completed the Health Meets Food class or Nutrition Teaching Day. Overall improvement calculated by the difference between average post-program and pre-program scores.

Conclusions

This prospective cohort pilot study suggests that completion of the GCCM online learning modules increases the level of nutrition knowledge of medical students. However, this increase in knowledge is less than that gained by students who complete the comprehensive GCCM curriculum, including hands-on cooking and online learning.

Limitations include small sample size, short-term follow-up, and non-compliance completing the online curriculum, and statistically significant different individual baseline assessment scores. Future studies should improve the study design by administering the online curriculum simultaneously to Health Meets Food and Nutrition Teaching Day participants, decrease the testing burden of baseline knowledge assessment, assess long-term knowledge retention, add statistical adjustment based on student's past exposures, and assess any difference in program completion during the preclinical versus clinical years. This study is on-going and will continue to improve and compile data.

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