ILLUMINATIONS

Medical students teaching peer athletes: an innovative way of instructing the physiology of exercise, nutrition, and sleep as fundamentals for lifestyle medicine

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TEACHING HEALTHCARE PROVIDERS, such as physicians, nurses, medical assistants, psychologists, and physical therapists, about the physiology of nutrition, sleep, and exercise (lifestyle medicine) is essential for their professional education (8); however, such instruction has proven to be difficult (11) and underaddressed in medical education (7). Unfamiliarity with physiology impairs providers’ understanding of lifestyle change benefits and their ability to instruct patients on making these changes. The deficits in knowledge, along with lack of confidence and skills, has resulted in the exclusion of lifestyle change (such as nutrition, exercise, and smoking cessation) recommendations from medical management plans of chronic diseases (9). This oversight is critically important because it is well established that lifestyle changes, such as improving eating habits or increasing physical activity, can be used to prevent, treat, and reverse the progression of chronic diseases, such as cardiovascular disease, type 2 diabetes mellitus, and cancers (1, 2, 4, 6, 16–18). Thus finding innovative ways to increase the knowledge, confidence, and skills of future healthcare providers in prescribing lifestyle interventions is vitally important.

Multiple government and educational institutions, including the National Institute of Diabetes and Digestive and Kidney Diseases, the National Academy of Science, Harvard Medical School, and the Lifestyle Medicine Consortium, have highlighted the need for outside-the-box teaching in nutrition for undergraduate and graduate medical training (3, 7, 8, 14, 19). Other studies also note a need for innovative teaching approaches in motivational interviewing (5), exercise physiology, and athletic performance-based nutrition (10, 13). Optimal nutrition and sleep not only enhance an athlete’s long-term health, they also have immediate positive effects on maximizing athletic performance and exercise recovery (15).

To address the need for lifestyle medicine education, we designed an innovative instructional program called Lifestyle for Athletic Performance (LAP), in which medical students coached peer football athletes on making lifestyle changes for peak athletic performance. The purpose of this study was to determine whether the LAP program was a successful pilot that could be used in the future to build on our institution’s lifestyle medicine education. As such, we studied medical students’ buy-in and perception of the LAP program. To the best of our knowledge, there are no documented studies involving programs in which medical students utilize lifestyle medicine to coach peer athletes. The utility and benefit of the LAP program is described here.

METHODS

Twenty medical students voluntarily participated in the LAP program during the summer break between their first and second preclinical curriculum year. Medical students served as teaching assistants for the University of Central Florida’s National College Athletic Association Division I football student team. Medical students contributed to the development and delivery of seven lifestyle medicine sessions that focused on lifestyle changes for achieving peak athletic performance (see each session’s objectives in Table 1) using evidence-based material provided by the Program Director. On average, medical students completed 2 h of prerequisite reading, 2–3 h developing teaching materials, and 45 min delivering the educational intervention. Each session included two components: 1) a teaching part, in which handouts were used to discuss evidence-based information about lifestyle aspects important for peak athletic performance; and 2) a corresponding individual goal-setting/counseling part in which we used motivational interviewing to help athletes identify individual personal behavior changes to achieve the goals set by their coach for the particular topics discussed. Sessions were delivered in a small-group setting with one medical student for five to six peer football athletes, followed by a large-group, faculty-facilitated debrief. For this study, the Program Director was a physician scientist (board certified in Family Medicine and with a PhD in Nutrition) with extensive clinical, research, and teaching expertise in lifestyle medicine (which integrates nutrition, exercise, and sleep). The director developed the program with consultation from specialists in physiology and closely supervised the learners’ education and performance. Assessment tool. Following completion of the program, medical students’ participation, perceptions of the LAP program, and confidence in lifestyle medicine were obtained by an online, postintervention, voluntary survey delivered using Qualtrics Survey Software managed by Qualtrics in Provo, UT. The survey contained 10 items: 2 multiple choice questions assessing the number of sessions that students delivered or developed; 7 Likert-style questions (strongly agree, agree, neutral, disagree, strongly disagree) to determine their perception of the LAP program and confidence in providing lifestyle medicine advice; and 1 free response question assessing perceived participation gains. Students were not compensated for completing the survey. The Institutional Review Board at University of Central Florida approved the postintervention survey (SBE-16–12351).

Data analysis. The internal reliability of the survey instrument was assessed by calculating Cronbach’s coefficient α. Descriptive statistics analyses were performed for all multiple choice questions. Values for continuous variables are presented as median and interquartile
range (IQR). The Likert scale questions were converted to a corresponding score as follows: 1 for strongly disagree; 2 for disagree; 3 for neutral; 4 for agree; 5 for strongly agree. Correlation studies were performed to evaluate the relationship between participation in the delivery or development of the sessions and the perceived benefit. Statistical significance is defined as $P$ value < 0.05. Statistical analysis was performed using Microsoft Excel 2010.

**RESULTS**

**Medical student buy-in and participation.** The LAP program was completed as proposed by delivering seven weekly sessions supported by educational products. Students’ participation and perception were collected using the online postintervention survey. Ten of twenty medical students completed the survey ($n/N = 10/20$, 50% response rate). The Cronbach’s coefficient $\alpha$ for the survey was 0.89, suggesting good internal consistency.

The answers to the first two questions of the survey showed that each respondent participated in the delivery of 3.5 sessions (IQR 2.25–4) and in the development of 2.0 sessions (IQR 1–5.5). Seventy percent ($n/N = 7/10$) of the respondents participated in the delivery of more than one-half of the sessions.

**Medical student perception.** To determine whether the medical students perceived increased confidence in their ability to provide lifestyle medicine advice after the LAP program, they were asked to rate their agreement with three statements (median responses and IQR are presented in Table 2). Statement 1 shows that students agreed that the program increased confidence in discussing nutrition advice with the athletes, the target population in this study. The data from statements 2 and 3 also show an increased confidence in providing this advice to patients and motivating patients to change lifestyle. One of the goals of the first-year curriculum at our institution is for students to be able to complete patient history. Statement 4 asked whether the LAP program increased confidence in obtaining a patient’s history, and, surprisingly, the median response was neutral. The next set of questions was designed to obtain student perceptions of the value of lifestyle medicine and the LAP program. Medical students agreed that lifestyle medicine recommendations are valuable in the doctor-patient relationship (statement 5), and that the LAP program was a valuable use of their time (statement 6). Furthermore, students felt that the LAP program was something that should be added to the medical school curriculum (statement 7).

There was a significant positive correlation between a respondent’s composite survey score for the question on benefits of the program (statements 1–7) and the number of sessions in which they developed educational content ($r = 0.85$, $P < 0.05$); however, this correlation was not observed with the number of sessions in which medical students participated ($P$ = nonsignificant). From the individual component items of Table 2, only statements 3 and 4 were positively correlated with both the degree of session participation ($r = 0.67$, $P < 0.05$, and $r = 0.68$, $P < 0.03$, respectively) and development ($r = 0.92$, $P < 0.001$, and $r = 0.78$, $P < 0.01$, respectively).

To gain further insight into how participants perceived the LAP program, an open-ended free text response question was provided in the survey instrument. Representative results are provided in Table 3. Twenty of twenty-two comments from the survey discussed the benefits of their learning experience with nutrition. These were broken down into three major themes: improved student knowledge, improved student skills, and confidence and exposure to a novel patient population. Two comments focused on barriers to the LAP program experience that included the difficulty in keeping the attention of the athletes, a barrier that medical students report they eventually overcame.

**DISCUSSION AND CONCLUSIONS**

This pilot study showed that the innovative LAP program (medical students coaching peer athletes on lifestyle medicine) was completed with weekly sessions supported by educational products. Respondent medical students were engaged and perceived their participation as valuable. Respondent medical students perceived that participating in the LAP program increased their confidence, skills, and knowledge for practicing lifestyle medicine and as beneficial to their medical education.

Medical students had the opportunity to learn about physiology through a clinical application, which allows for higher level learning (12).

**Table 1. Lifestyle medicine sessions and session objectives**

<table>
<thead>
<tr>
<th>Lifestyle Medicine Session</th>
<th>Objective(s)</th>
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<tbody>
<tr>
<td>Session 1</td>
<td>Identify the athlete’s nutrition and lifestyle concerns.</td>
</tr>
<tr>
<td>Session 2</td>
<td>Discuss body composition and its role for achieving peak athletic performance. Discuss basic food composition, caloric content, and how to correctly read food labels.</td>
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<tr>
<td>Session 3</td>
<td>Discuss the importance of proper meal choices and timing to achieve optimal athletic performance.</td>
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<tr>
<td>Session 4</td>
<td>Discuss sleep quality and quantity.</td>
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<tr>
<td>Session 5</td>
<td>Discuss weight loss/gain strategies.</td>
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<tr>
<td>Session 6</td>
<td>Discuss proper nutritional supplements.</td>
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<tr>
<td>Session 7</td>
<td>Discuss ways to eat healthy on a budget.</td>
</tr>
</tbody>
</table>

**Table 2. Student perceptions of confidence and experience following the LAP program**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Median Response</th>
<th>Interquartile Range</th>
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<tbody>
<tr>
<td>1. Increased my confidence in giving nutrition advice to athletes.</td>
<td>4.5</td>
<td>4.0–5.0</td>
</tr>
<tr>
<td>2. Increased my confidence in discussing nutrition advice with patients.</td>
<td>4.0</td>
<td>4.0–4.0</td>
</tr>
<tr>
<td>3. Increased my confidence in my skills for motivating patients to change their lifestyle.</td>
<td>4.0</td>
<td>4.0–4.8</td>
</tr>
<tr>
<td>4. Increased my confidence in obtaining patient history.</td>
<td>3.0</td>
<td>2.3–4.0</td>
</tr>
<tr>
<td>5. Increased my appreciation that lifestyle management recommendations are a valuable use of limited patient-doctor time.</td>
<td>5.0</td>
<td>4.0–5.0</td>
</tr>
<tr>
<td>6. The LAP program was a valuable use of my time.</td>
<td>4.0</td>
<td>4.0–4.8</td>
</tr>
<tr>
<td>7. The LAP program should be added to the medical school curriculum.</td>
<td>4.0</td>
<td>3.0–4.8</td>
</tr>
</tbody>
</table>

Values are median responses with 25th and 75th interquartile range; $n = 10$ subjects.
Focusing student athletes during conversations “It was difficult to keep their attention at first.”

Improved students’ knowledge about:
- Knowledge
- Athlete population

Improved students’ skills and confidence in:
- Discussing nutrition
- Motivational interviewing

Exposed students to a novel patient population

Focusing student athletes during conversations

Seventy percent of the respondents participated in the delivery of more than one-half of the sessions, suggesting engagement and buy-in. Respondent medical students who developed sessions perceived more benefit of the LAP program than those that only delivered sessions. Student motivation and ownership could be responsible for this difference. Williams and Williams (20) discussed five factors that influence student engagement: student, teacher, content, method/process, and the environment. The student must have interest and value in his or her education (20). Our study included medical students who volunteered for this encounter over the summer, so that in itself provides interest. The teacher must be well trained and responsive to the students (20). The primary instructor was an MD and PhD, with training in family medicine and nutrition, with high student teaching evaluations, so she was a qualified and responsive teacher. The content should be pertinent to the student’s current and future needs and should provide tools that can be applied in the student’s real life (20). Our study addressed both of these factors in that medical students are only beginning to gain confidence at the end of year 1 for discussing information with patients. It is also likely that many patients will be expecting advice on nutrition and exercise, as lifestyle medicine has become a high priority in medical practices. The environment needs to be safe and personalized as much as possible (20). Students were involved in the design of the content and, therefore, were able to personalize this experience. It is possible that the students in our study who developed materials were more engaged and learned the knowledge aspect of lifestyle medicine better.

Our study did not show an increase in confidence in obtaining patient history. This is most likely due to a few considerations. In the University of Central Florida College of Medicine curriculum, it is expected that students be able to obtain a patient history at the end of year 1. A required summative Objective Structured Clinical Examination currently assesses students. Therefore, students may have sufficient confidence at this educational point. Another consideration is that surveyed medical students did not consider their peer athletes as simulated “patients.” Further information would be needed to interpret this finding. However, their confidence in obtaining patient history and performing motivational interviewing was improved by both session participation and development. This program helped students learn about customizing management plans depending on the whole person, an approach called personalized medicine. Most importantly, it improved their appreciation for the importance of including lifestyle recommendations in the management plan, even when patient-doctor time is limited, a goal that is difficult to accomplish through traditional teaching sessions.

Participants also indicated that this program should be added to their curriculum. Given the importance of lifestyle medicine education and the critical need for innovative teaching modalities, the next step is to integrate this program in the curriculum (as either required or elective), and to extend the program to other athletic student teams interested in improving lifestyle for athletic performance. The appropriate faculty expertise would be warranted, depending on the objectives of the program. In our study, the primary faculty member had a unique background with an MD degree in family medicine and a PhD in nutrition and access to physiology experts for consultations. Other colleges that want to utilize this type of program need to have faculty with expertise in the physiology of nutrition, exercise, and sleep, as well as in clinical medicine and nutrition to be successful in this type of program. It is also important to deliver these sessions as knowledge and skill educational sessions only supporting the goals established by the coaching team, to avoid delivering a treatment program that will change the focus of the intervention and require a different type of supervision from sports dieticians, malpractice coverage, and studying the change in athletes’ health and performance.

The major limitation of the present study is that it lacks baseline data, only including data obtained after the LAP program. Therefore, volunteers in this study may have had a high interest and confidence in the measured statements previously. While further studies are necessary to do a proper program analysis and drive optimization, the need for medical students to become more confident and knowledgeable in lifestyle medicine provides importance for this innovation. The open-ended responses also provided data that support the survey question data of perceived educational benefit. Despite these limitations, the overall data suggest that this pilot program, teaching components of lifestyle medicine using an innovative never described approach, is feasible in undergraduate medical education and may be used for designing larger interventions.

In conclusion, the LAP program was a successful pilot program for introducing an innovative outside-the-box teaching intervention designed to improve medical students’ knowledge, skills, and confidence in lifestyle medicine. Further studies could be designed for the application of nutrition,
examine, and sleep physiology in the education of other health-care professional trainees.

AUTHOR CONTRIBUTIONS

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REFERENCES


