Nutrition Counseling by Medical Students at a Student-Run Free Clinic Using Goal-Setting and the MyPlate Method

Thuy-An Tran; Nancy Yang; Natalie Davis; Katherine Arden; David Skovran; Brijen Shah, MD; David Thomas, MD, MHPE; Yasmin Meah, MD

†Icahn School of Medicine at Mount Sinai, New York, New York, USA
‡Departments of Medicine, Icahn School of Medicine at Mount Sinai, New York, New York, USA
§Departments of Medicine, Medical Education, and Rehabilitation Medicine, Icahn School of Medicine at Mount Sinai, New York, New York, USA

Corresponding Author: Thuy-An Tran; email: thuy-an.tran@icahn.mssm.edu
Published: May 3, 2017

Abstract

Background: Lifestyle counseling in the primary care setting has been shown to have significant health outcome benefits for patients with chronic diseases like diabetes, obesity, and cardiovascular disease. General physicians often do not provide adequate lifestyle and nutrition counseling due to time constraints or lack of knowledge and training. In order to increase access to nutrition counseling in a low-resource setting and to increase physician comfort in counseling patients, we designed an intervention in which medical students conducted nutrition counseling using goal-setting and teaching MyPlate.

Methods: This study was conducted at the East Harlem Health Outreach Partnership, a student-run, physician-supervised free clinic that serves uninsured adults. Student clinicians used a standardized script to provide nutrition counseling to patients, and patients’ pre- and post-intervention knowledge of MyPlate and nutrition goals were recorded.

Results: Fifty-seven patients and 36 students participated in the intervention with a significant increase in patients’ knowledge of MyPlate and health goals.

Conclusions: We posit that this simple intervention can be implemented in primary care clinics, especially those in which medical students rotate.

Background

Lifestyle counseling is a crucial component of preventive care in the primary care setting, and its importance is growing with the rising epidemic of chronic diseases. It is well recognized that unhealthy lifestyle behaviors, such as poor nutrition and limited physical activity, are responsible for much of the morbidity and mortality associated with the leading chronic diseases, including obesity, diabetes, cardiovascular disease, hypertension, and stroke.† Many of these lifestyle behaviors are modifiable, and interventions aimed at improving patient lifestyle have been demonstrated to significantly improve health outcomes.‡ However, despite the described benefits of lifestyle changes in treatment guidelines, primary care physicians often do not provide adequate lifestyle counseling. For example, a study of 548 obese patients found that less than 50% had been advised to lose weight by their primary care physician in the past 12 months.§ This may be due to time constraints, inadequate compensation, or lack of physician knowledge and training.¶ As chronic diseases become increasingly common in adult populations, the need for lifestyle counseling becomes imperative.

To enhance physician comfort and skills in lifestyle counseling, physicians must develop a basic understanding of modifiable risk factors and counseling skills early in training during medical school. This is particularly true for nutrition, given that nutrition counseling and education are currently poorly emphasized in medical school curricula. In 1985, the National Academy of Sciences recommended that US medical schools provide a
minimum of 25 hours of nutrition education to students. However, a 2010 survey of 105 medical schools found that only 27% met this standard, and 79% of medical school instructors polled believed their students required more instruction on nutrition education. Compounding the issue, medical students find less value in nutrition education as they progress through training. A study following 2,316 medical students through four years of training found that many fourth year medical students perceived nutritional counseling to be less important than they did during their first year, and only 17% of fourth year students reported frequently counseling their patients in nutrition. Unsurprisingly, another survey found that first year medical students who did partake in a nutrition curriculum had greater confidence in their nutrition counseling skills.

Student-run free clinics provide a unique educational setting for medical students to cultivate nutrition counseling skills, while also providing needed nutrition counseling for patients. In this study, we sought to develop a nutrition education intervention designed to (1) enhance the understanding and abilities of pre-clinical medical students in providing basic nutrition counseling in a primary care setting and (2) increase access to nutrition education in a low-resource setting. The intervention was implemented at The East Harlem Health Outreach Partnership (EHHOP) – a student-run, physician-supervised primary care clinic that serves uninsured adults in East Harlem, New York City. With East Harlem having some of the highest rates of diabetes and hypertension in New York City and given that in a survey of 39 EHHOP patients, 66% wished to learn more about healthy eating, the potential benefits of nutritional counseling in this patient population are high.

Methods

Setting

The East Harlem Health Outreach Partnership (EHHOP) is the Icahn School of Medicine at Mount Sinai’s student-run, physician-supervised free clinic that provides comprehensive longitudinal primary health care to uninsured patients in East Harlem. Since 2004, over 700 uninsured adults have been served by EHHOP. The average patient age is 48 years old. A majority of patients are Spanish-speaking only. The chronic disease burden of EHHOP patients reflects that of East Harlem; 40% of EHHOP patients have hypertension and 17% have diabetes. Due to lack of insurance and low income levels, EHHOP patients face significant challenges in accessing affordable health care and suffer from greater morbidity from chronic illnesses like diabetes and hypertension compared to residents in other neighborhoods in Manhattan.

EHHOP is staffed by medical students across all four years of training. Clinical teams consist of a Teaching Senior, Senior Clinicians, Junior Clinicians, clinic managers, lab personnel, patient advocates, social workers, and several other positions necessary to maintain a functioning clinic. See Table 1 for a more detailed description of key clinic positions.

Study Sample

All patients seen at EHHOP for full medical visits from September 2014 to November 2014 were eligible to participate in the study intervention. There were no exclusion criteria, though some patients were not offered the intervention due to time restraints on the medical visit. The study was approved by the Mount Sinai Institutional Review Board.

Intervention: Using a Standardized Script

Junior clinicians conducted one-on-one nutrition education sessions with EHHOP patients as part of the patients’ scheduled medical visits. Nutrition sessions were conducted using a standardized script (Appendix 1) which consisted of 1) education on the New York City Department of Health’s MyPlate and 2) nutrition goal-setting. The script was written with the guidance and approval of a registered dietitian who works directly with
Figure 1. MyPlate

Medical students used the NYC Department of Health’s MyPlate to teach patients about food groups and proportioning meals. MyPlate was included in all scripts for medical students and patients were all given a copy to bring home.

EHHOP patients. Each session was conducted in the clinic rooms, lasted 5-10 minutes and was conducted in English or Spanish. Junior clinicians who did not speak Spanish used an in-person or telephone Spanish interpreter to conduct interventions for Spanish speaking patients. The standardized script was emailed to all junior clinicians one day prior to clinic for them to review. On the morning of clinic day, each junior clinician was then given a printed script and encouraged to go through the lesson with their patient. The standardized script served to aid students in their counseling and offered suggestions on approaches to nutrition education. The script also ensured that students could perform effective nutrition counseling with minimal prior training. Students were encouraged to conduct the intervention during natural moments of downtime in the patient encounter (e.g., when the patient was waiting to be seen by the attending physician).

Intervention: The MyPlate Method

MyPlate is an educational tool that was created in 2011 by the United States Department of Agriculture and adapted by various state health departments to communicate key recommendations of the 2010 Dietary Guidelines and to promote positive nutrition behaviors and balanced food choices (Figure 1). MyPlate illustrates the 5 food groups (fruits, vegetables, grains, protein, and dairy) in a simple, colorful, and easy-to-understand way by representing each food group as a section of a mealtime place setting. The NYC Department of Health’s version of MyPlate (i.e., MyPlate Planner) illustrates 4 food groups (starch, protein, vegetables, fruits) using a 9-inch plate with the following sections: ¼ starch, ¼ protein, and ½ vegetables.
in addition to a side of fruit (Appendix 1). Illustrative examples of each food category appropriate for breakfast and lunch/dinner are also provided. MyPlate is a proven tool used for nutrition education and its use in previous studies of nutrition education have resulted in increased knowledge of food portions as well as increased vegetable intake.

Prior to the intervention, the patient’s baseline nutrition knowledge and motivation were assessed by asking the patient if he/she had ever heard of MyPlate and if he/she had any current nutrition goals. Patients who had heard of MyPlate before were asked to draw and label a blank MyPlate. Any pre-intervention nutrition goals were also recorded. Then, using the standardized script as a guide, junior clinicians educated all patients on the NYC Department of Health’s MyPlate, focusing specifically on the 4 MyPlate food groups, the relative proportion of each food group, and culturally relevant examples of foods in each food group.

**Intervention: Goal-setting**

Junior clinicians also worked together with patients to develop 1-2 nutrition goals that the patient could feasibly accomplish in a few weeks. Examples of nutrition goals were available to junior clinicians via the script (See Appendix A). All patient post-intervention nutrition goals were recorded. Upon setting nutrition goals and completing the intervention, all patients were given a handout containing a copy of the MyPlate Planner and their nutrition goals to take home; patients were encouraged to post the handout in a visible area in their home (e.g., refrigerator).

**Measures**

Patient understanding and comprehension of MyPlate was assessed by having patients draw the MyPlate Planner at the end of each nutrition education session. These MyPlate recalls were scored as either correct or incorrect. A MyPlate recall was scored as correct if all of the following criteria were met: 1) all 4 food groups were included and 2) food groups were drawn in the correct proportion. Of note, patient recall of MyPlate acted as an additional educational tool for teaching MyPlate. Students were instructed to provide further education to patients if the MyPlates were drawn incorrectly.

**Results**

Thirty-six junior clinicians completed a total of 61 interventions with 57 unique patients from September 2014 to November 2014 over 12 clinic days. Four patients received the intervention twice; the second interventions were excluded from the analysis to prevent skewing of data from prior exposure to the intervention.

**MyPlate**

Prior to the intervention, 23 (40%) patients had heard of MyPlate and 8 (14%) of these patients were able to correctly draw a MyPlate. All patients received counseling on MyPlate as part of the intervention, regardless of prior knowledge. Of note, only 40 (70%) patients completed the post-intervention MyPlate recall; interventions were not completed due to time constraints during the clinic visit or because the patient refused. However, of the patients who did complete the intervention, in the post-intervention recall, 26 (65%) patients were able to correctly draw a MyPlate (Figure 2). Chi-square test with listwise elimination showed that patients were significantly more likely to accurately draw a MyPlate following the intervention (p < 0.001).
Nutrition Goals

Prior to the intervention, 30 (53%) patients had nutrition goals. After the intervention, 48 (84%) patients had established a minimum of two health goals, with an average of two health goals set per patient (Figures 3 and 4). Thirty-three (58%) patients created new post-intervention goals, while 15 (26%) patients kept their pre-intervention goals. Nine (16%) patients did not establish new goals because they either were unable to complete the intervention given time restraints or declined to participate as they felt their diet was already sufficiently healthy. Patients’ post-intervention nutrition goals are summarized in Table 2.

Barriers to Completion

Seventeen (30%) patients did not finish the post-intervention MyPlate recall, and 9 (16%) did not develop nutrition goals. Of the interventions that were not completed, 11 interventions had documented reasons: 7 junior clinicians cited running out of time and 4 cited that patients declined completing the intervention. One patient declined, stating that healthy food was too expensive, while another patient did not complete the intervention due to pain during the clinic visit.

Discussion

This study provides evidence that pre-clinical medical students can conduct effective nutrition counseling on MyPlate and nutrition goals during

Table 2. Post-intervention Nutrition Goals

<table>
<thead>
<tr>
<th>Nutrition Goals</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>More fruits &amp; vegetables</td>
<td>22</td>
</tr>
<tr>
<td>More water or less sugary drinks</td>
<td>14</td>
</tr>
<tr>
<td>Portion control</td>
<td>13</td>
</tr>
<tr>
<td>More balanced diet</td>
<td>12</td>
</tr>
<tr>
<td>Better cooking methods/less fried food</td>
<td>9</td>
</tr>
<tr>
<td>Less sugar &amp; sweet</td>
<td>5</td>
</tr>
<tr>
<td>More regular eating schedule</td>
<td>4</td>
</tr>
<tr>
<td>Eat out less</td>
<td>3</td>
</tr>
<tr>
<td>More exercise</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>96</strong></td>
</tr>
</tbody>
</table>

A summary of post-intervention nutrition goals established by patients.

Figure 3. Pre-Intervention Nutrition Goals

![Pre-Intervention Nutrition Goals](image)

Before the intervention, each patient was asked if he/she had any nutrition goals. Thirty (53%) patients already had nutrition goals, while 20 (35%) did not have any nutrition goals. Seven (12%) patients were not asked about previous nutrition goals.

Figure 4. Post-intervention Nutrition Goals

![Post-intervention Nutrition Goals](image)

After the intervention, 48 (84%) patients had established at least two nutrition goals, an increase from 30 (53%) patients who had nutrition goals prior to the intervention. Of patients who had established nutrition goals post-intervention, 15 (26%) patients kept their previously established goals.
primary care medical visits using a simple standardized script.

In this study, 57 patients were able to benefit from the intervention and 36 pre-clinical medical students were able to engage in nutrition counseling. Patients were able to accurately recall the plate at the end of 65% of interventions, which was an improvement from 14% at baseline. The post-recall plate was done a few minutes after teaching about MyPlate, providing an opportunity to reinforce the concepts of the MyPlate. These results show that our simple nutrition intervention increased understanding and recall of MyPlate in the short-term, and provides evidence suggestive of the potential for simple interventions to improve nutrition literacy and lifestyle changes in the long-term.

Additionally, 84% of patients had established nutrition goals by the end of the intervention, an increase from 53% of patients who had nutrition goals prior to the intervention. Nutrition goals were varied and majority were easy, specific goals that patients could feasibly accomplish. The most common goals were adding more fruits and vegetables, cutting down portion sizes, and drinking less sugar.

This study also suggests that medical student led nutrition counseling can feasibly be incorporated into the clinic flow of student-run clinics. We were able to conduct 61 interventions over 12 clinic days, representing an average of 5 interventions per clinic day (out of the total 12 patients usually seen each clinic day). Patients may not have received the intervention due to either time constraints during a busy clinic visit or junior clinicians declining to participate. Of note, this intervention was conducted at the beginning of the academic year when many junior clinicians were experiencing their first patient encounters. Also, prior to this intervention, there were no expectations for junior clinicians to conduct nutrition education and counseling with patients in clinic. We believe that as junior clinicians become more comfortable with clinic throughout the year and as nutrition education and counseling is further incorporated into the expectations of junior clinicians, more patients will receive this intervention.

Our intervention also demonstrates ease in involving pre-clinical medical students in nutrition counseling in the clinic setting. Through the intervention, 36 pre-clinical medical students were able to engage in nutritional counseling as early in their medical education as the beginning of their first year. With a simple, but detailed standardized script, pre-clinical medical students with limited prior nutrition knowledge were able to practice hands-on nutrition education and counseling with positive patient outcomes. The experience and skills gained with this intervention could lead to more effective nutrition counseling and improved attitudes about the value of nutrition in managing chronic illness as students advance in their medical careers.

Limitations and Future Directions

Our study has several limitations. First, the study was conducted over a 3-month time period, which limited our ability to assess the long-term effectiveness of the intervention on MyPlate knowledge and on patient adherence to nutritional goals. Further studies need to be conducted to determine how the intervention affects patients’ nutrition education, goals, and behaviors beyond the initial intervention. Nutrition goals should be addressed at follow-up visits to help determine whether a repeat of the same intervention is helpful or if a new educational script should be developed that builds on prior knowledge. Future interventions should consider documenting nutrition goals in the electronic medical record in a standardized way to improve long-term follow-up and monitoring, and should also consider training a dedicated group of medical students who provide longitudinal nutrition support for patients.

Second, there were various barriers to completing the intervention. Because EHHOP offers many services outside of a medical visit, such as an in-house lab and social work services, it is often difficult to find an appropriate time during which to complete the intervention without interruptions. Some interventions remained incomplete due to time constraints. Future iterations of this standardized script will need to be adapted to accommodate clinic flow unique to individual clinics. It will also be necessary to include time prior to clinic in which to educate junior clinicians on how to use the script to conduct nutrition education so that their counseling time is spent efficiently.

Finally, the effects of the intervention on medical students’ attitudes on nutrition and confidence with patient counseling were not directly assessed. It is unclear what the long-term effects of this intervention will be on the participating students’ future practice as physicians. Further study on medical students’ attitudes about and confidence in conducting nutrition counseling with patients is necessary and critical to
strengthen the intervention as a medical education tool.

**Conclusions**

Our data suggest that student-conducted individualized nutrition education sessions are an effective and efficient means of providing nutrition counseling to underserved populations in the free clinic setting while providing an educational opportunity for pre-clinical medical students to develop counseling skills. We posit that these interventions would have a place in all primary care clinics in which medical students rotate. Using the MyPlate tool and goal-setting allows for a simple yet successful approach to teaching about nutrition in a resource and time limited environment.

**Acknowledgements**

We are grateful to EHHOP Leadership, EHHOP Nutritionist Kelly Hogan, and the Quality Improvement Council for support and comments, and especially our junior and senior clinicians for remaining dedicated to our patients.

**Disclosures**

Funding support from Mount Sinai Auxiliary Board, Mount Sinai Medical Student Research Office, and Icahn School of Medicine at Mount Sinai Student Council. This study was approved by the Mount Sinai Institutional Review Board.

**References**

Appendix 1. Standardized Counseling Script

Script: Introduce yourself to the patient and let them know that you will be talking to them briefly about nutrition and filling out a questionnaire. Example: “Hi, my name is { } and I’m a first year medical student. I’d like to take a few moments to talk to you about your diet and nutrition.

Part A: Pre-education assessment:

Ask the patient the following questions: Have you ever heard about My Plate or Healthy Plate?

- Yes  No (go to Question #2)

If yes: Ask the patient to draw and label a My Plate below.

When done with Part A, please move onto Part B on the next page.

Ask: Do you have any current nutrition goals?

(Other ways to ask this question: “Do you have any goals to eat more healthily? Do you have any goals to eat better?”)

- Yes  No (if no, move directly to Part B & C)

If yes: what are your current nutrition goals? Please try to be specific other than “I want to eat more healthily” (ie. “I want to eat 1 cup of broccoli everyday and I want to eat fewer tortillas”). Please record the patient’s nutrition goals below.

Goal #1:

Goal #2:

After recording the patient’s goals, please move onto the health education lesson (below).

Part B: My Plate: Tear out the Patient Pamphlet (last page of packet). With the Patient Pamphlet in front of you, show them the Healthy Plate tell the patient that: a healthy meal will have food from all four food groups: fruit, grains, vegetables, and protein. Show them the Healthy Plate and point to each food group, giving examples of what food from each group is:

Fruit: Apples, oranges, bananas, etc.

Grains: Rice, bread, pasta, polenta

Vegetables: Lettuce, carrots, broccoli

Protein: Meats, fish, tofu, beans

Show the patient the My Plate and have them notice that the “vegetable” section is bigger than all the others – this means that there should be more vegetables on your plate than anything else. Explain to the patient that their plate should proportionally look like the My Plate (equal grains and proteins, more vegetables).
Part C: Goal-setting: Tell your patient that you’d like to help him/her set 1-2 goals to eat more healthily. If your patient already filled out goals in the pre-assessment (Part A), ask your patient if he would like to make any changes or modifications to his/her goals and write them below and in the Patient Pamphlet.

Ask the patient, “Now that you have learned about the Healthy Plate, what are 1-2 nutrition goals that you would like to set?” or “what are 1-2 changes that you want to make to your nutrition / diet?” If the patient doesn’t know, ask them how they can make their meal look more like the Healthy Plate and offer some general suggestions, below:

- Eating smaller portions
- Eating out less (When you eat out, you have less control over what is in your food. A lot of restaurants use unhealthy ingredients, like salt and butter, and have larger portions)
- Eating more vegetables
- Eating less fried food (Instead of frying your food, you can grill, steam, or bake your food)
- Replacing some grains with more vegetables (less rice/tortilla, more veggies)
- Drinking water instead of soda or juice (Soda and juice has a TON of sugar, which can easily make you gain weight. Gatorade is not healthy!!)

Write the goal(s) below. Also guide the patient in writing down his/her own goals on the goal-setting portion of the Patient Pamphlet.

Goal #1:

Goal #2:

Part D: Post-assessment recall

Ask the patient to draw and label a Healthy Plate below. Make sure they can’t see the Healthy Plate in the Patient Pamphlet. Please do not give any guidance, except in helping them record their answer. (The patient can write in English or Spanish).

Closing

Thank your patient for taking the time to talk with you and wish them the best on his/her goals. Hand the patient the Patient Pamphlet with his/her goals. Encourage them to post the Pamphlet in their kitchen.

If you could not finish the lesson, please select the reason why:

- I ran out of time  
- The patient declined  
- Other: _________________

The interview was conducted in:  
- English  
- Spanish  
- Spanish via Interpreter  
- Other: _________________

Patient pamphlet: (This is for the Patient to Take Home)
MyPlate

Nutrition Goals:
#1:
#2: