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Original Study

# Improving Student Clinicians' Documentation of Lifestyle Modification

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## Abstract

**Background:** Lifestyle modification is an important component of clinical encounters, particularly in student-run free clinics that provide care for uninsured patients with a high burden of chronic disease. This study aimed to evaluate the effect of two interventions on the rates of documentation of patient diet, exercise, and health goals at East Harlem Health Outreach Partnership (EHHOP), a student-run free clinic affiliated with the Icahn School of Medicine at Mount Sinai.
**Methods:** A quasi-experimental study was performed at EHHOP over 12 weeks from September to November 2015. Rates of documentation of lifestyle modification and health goals discussions were assessed at baseline and following two periods of intervention. Intervention 1 used electronic medical record (EMR) templates for documenting discussions, and Intervention 2 used focused student teaching to prioritize discussion and documentation of lifestyle modification and health goals. Patient characteristics and documentation rates were compared between each of the three time periods.
**Results:** A total of 161 patient visits were included. There were no significant differences in patient characteristics between Baseline (n=54), Intervention 1 (n=50), and Intervention 2 (n=57) time periods. Rates of documentation increased from 48% (Baseline) to 56% (Intervention 1) to 68% (Intervention 2) for diet, 25% to 42% to 53% for exercise, and 22% to 34% to 39% for health goals. EMR-based Intervention 1 was more effective in improving documentation rates for clinicians caring for patients without diabetes, and student teaching-based Intervention 2 was more effective in improving documentation rates for clinicians caring for patients with diabetes.
**Conclusions:** Systemic efforts that incorporate targeted EMR templates and teaching can help promote documentation rates of lifestyle modification discussions in student clinicians.

## Introduction

Discussions about lifestyle modification and patient health goals during clinical encounters can improve patient health literacy and enhance health outcomes.[1] Such discussions may be especially important in student-run free clinics (SRFCs) that provide care for uninsured patient populations with a high burden of chronic disease and low rates of health literacy.[1-3]

Student clinicians in SRFCs can function as effective health coaches no matter what their year of training.[4,5] However, medical training often focuses on clinical management of disease with pharmacotherapy rather than with lifestyle modification and prioritization of patient health goals. Additionally, it can be difficult to fit these discussions into already time-constrained settings common to trainee-managed clinics. Despite these challenges, placing increased focus on lifestyle modification may have the potential to not only improve patient health outcomes, but also provide long-term cost benefits by decreasing pharmacologic needs. Therefore, increasing the

role of discussion focused on patient health goals and lifestyle modification has tremendous potential to benefit SRFCs with resource limitations.

High-quality documentation of these discussions in patient charts may serve as a proxy measure for the rates at which student-clinicians engaged their patients in discussion regarding lifestyle modification and health goals. Clinical documentation is the way in which clinicians record what was done during a patient encounter and communicate this to other clinicians.[8] Documentation is especially critical to ensure effective follow-up in a trainee clinic in which clinicians vary weekly and frequent handoffs are standard. We sought to evaluate baseline rates of documentation and the effect of two interventions for increasing documentation of patient diet, exercise, and health goals in a two-month period at East Harlem Health Outreach Partnership (EHHOP).

## Methods

*Setting*

EHHOP is a student-run free clinic affiliated with the Icahn School of Medicine at Mount Sinai that sees patients for scheduled appointments during clinic days that occur once per week.

*Study Design*

This study had four components: a pre-intervention patient needs assessment survey, baseline data collection, and data collection during two separate intervention periods. The first intervention (Intervention 1) involved using electronic medical record (EMR) templates, and the second intervention (Intervention 2) involved student teaching. Since the goal of the interventions was to promote behavioral change in student clinicians around lifestyle modification discussion, the primary outcome was documentation rates of lifestyle modification discussion.

This study was approved by the Icahn School of Medicine institutional review board.

*Needs Assessment*

To evaluate the health needs of uninsured patients at our SRFC and their level of empowerment in taking responsibility for their health, a pre-intervention patient survey was conducted in January 2015 at EHHOP. The patient survey in this study expanded on the 13-item Patient Activation Measure (PAM).[6] The 13-item PAM is an abridged version of the complete PAM, a valid and highly reliable scale used in the broader healthcare community to assess patients' knowledge, skill, and confidence in managing their own health (Online Appendix 1).[6,7] Our patient survey included questions from the 13-item PAM as well as multiple choice questions about barriers patients may face and preferred resources for health education. The survey was also translated into Spanish by student translators and was administered by our team to patients in the clinic waiting room. Patients were given the choice of filling out a paper survey independently or having a volunteer read them the questions and answer choices.

*Interventions*

Following the pre-intervention patient survey, a quasi-experimental study was performed at EHHOP over 12 weeks from September 19 to November 21, 2015. Prior to the implementation of any intervention, baseline data regarding presence and quality of lifestyle modification documentation was collected over four clinic days (August 15 to September 12). Subsequently, two interventions were introduced in a step-wise fashion. Each intervention period was 4 consecutive clinic days (Figure 1). Rates of documentation during each intervention period were compared to baseline and the other intervention period.

Intervention 1 (September 19 to October 10) focused on using EMR templates to improve both the frequency and quality of documentation of lifestyle modification during clinical encounters. The patient EMR used at EHHOP is Epic (Epic Systems Corporation). Two documentation templates, hereby referred to as "Smartphrases", were created and used in progress notes to automatically bring up a template of text. These Smartphrases were constructed based on a survey of student clinicians and were approved by both student and physician leaders at EHHOP (Online Appendix 2).

The first Smartphrase, "Diet and Exercise", prompted the provider to include information about the patient's current behaviors related to diet and exercise, as part of the Social History or History of Present Illness section of the note. The

***Figure 1.*** Study Design


second Smartphrase, "Health Goals", contained a free-form space to list patient health goals that the patient would like to accomplish by the subsequent visit as part of the Assessment and Plan section of the note. Weekly emails and in-clinic reminders were provided to encourage student clinicians to use these Smartphrases to guide discussion and documentation of lifestyle modification during each patient visit.

After Intervention 1, no intervention was performed for a period of 3 consecutive clinic days to minimize effects from Intervention 1 on Intervention 2. During this time, the documentation templates were still available, although their use was not actively recommended to student clinicians.

Intervention 2 (October 31 to November 21) utilized student teaching to further prioritize discussion and documentation of lifestyle modification with patients. Specifically, two additional features were integrated into clinic protocol. First, the fourth-year student clinician leader reviewed all patients scheduled for the clinic day to evaluate which patients would benefit most from lifestyle modification discussion, based on their clinical context. The presence of chronic conditions such as diabetes, hypertension, and obesity influenced this evaluation. The fourth-year student clinician leader emphasized the importance of lifestyle modification discussion to the third-year student clinicians and added it to the task list for them to address and document during the visit. Second, the EHHOP Nutrition Corps, a group of students trained to provide nutrition counseling to patients through motivational interviewing, were available in clinic to provide additional counseling to patients and document their discussions.

*Outcome Measurement*

Documentation rates were measured by reviewing the student notes in the EMR of all the patients seen during the four consecutive clinic days within each of the three study periods: Baseline (n=54), Intervention 1 (n=50), and Intervention 2 (n=57). All student notes were reviewed, including those written by third- and fourth-year student clinicians and by Nutrition Corps members. The presence or absence of any documentation related to diet, exercise, or health goals determined the overall documentation rates. Additionally, the presence of the following components was measured to evaluate the quality of the documentation: 24-hour diet recall, daily consumed beverages, proportion of meals home-cooked or take-out, access to healthy food, exercise quantity, exercise intensity or activity type, and number of health goals. To further investigate whether patients' chronic conditions affected the frequency and quality of student clinicians' lifestyle modification documentation, the diabetes status of patients was also recorded. Other data collected included whether the visit was a "New Visit", "Quick Visit" (brief visit which is meant to follow-up on a minor health problem), or "Return Visit" (full follow-up patient encounter), and whether the patient was a "Chronic Care Patient" (a patient who has a chronic disease that is managed longitudinally by a single student clinician).

*Statistical Analysis*

The Chi-squared test was used to determine if there were any significant differences in patient characteristics across study groups. The Fisher's exact test was used to analyze for differences in documentation rates among Baseline, Intervention 1, and Intervention 2 periods. All analyses were done in Microsoft Excel, and a threshold of $p<0.05$ was used to determine statistical significance.

## Results

*Needs Assessment*

The needs assessment survey (n=39) showed that EHHOP patients had a high level of confidence in achieving health goals but faced numerous barriers including cost, lack of time, and lack of knowledge. Seventy-seven percent of patients responded "yes" to the question "Do you have long-term health goals that you would like to achieve?", whereas the average confidence of the patients to achieve these long-term health goals was 3.64 on a rating scale of 1 (not confident) to 5 (very confident) (standard deviation = 1.27). One-on-one discussion with a clinician was the top resource patients indicated would help them achieve their health goals (68%) (Figure 2).

*Interventions*

A total of 161 patient visits were included in the study. The patient population characteristics in each time period (Baseline, Intervention 1, and Intervention 2) are delineated in Table 1. There were no significant differences between study groups in terms of patient diabetes status, type of visit, or whether the patient was a Chronic Care Patient.

From Baseline to Intervention 1, there was no significant difference in documentation rates of lifestyle modification (Figure 3). Diet documentation increased from 48% to 56% (p=0.42), exercise documentation from 35% to 42% (p=0.48), and health goal documentation from 22% to 34% (p=0.18). After the three-week wash-out period, implementation of Intervention 2 showed increased documentation rates, with diet documentation increasing to 68% (p=0.23 when compared to Intervention 1), exercise documentation to 53% (p=0.33), and health goal documentation to 39% (p=0.69). Among all patient encounters, compared to Baseline, student teaching-based Intervention 2 resulted in significantly increased rates of diet documentation (p=0.035), while there was a trend towards increased exercise documentation (p=0.085) and health goal documentation (p=0.068) (Figure 3).

Although in the overall sample Intervention 1 did not significantly increase documentation rates compared to the Baseline period, when the data were stratified by patient diabetes status, significant effects of intervention 1 were revealed (Figure 4). Rates of documentation of diet (p=0.023) and health goals (p=0.023) during EMR-based Intervention 1 were significantly higher than Baseline in patients without diabetes. However, rates of documentation during Intervention 1 were not statistically different from Baseline in patients with prediabetes or diabetes.

In the stratified analysis for Intervention 2, there were no significant increases in documentation of lifestyle modification compared to Baseline in patients without diabetes, with prediabetes, or with diabetes. For patients with diabetes, Intervention 2 showed statistically significant improvement compared to Intervention 1 in documentation of diet (p=0.0055), exercise (p=0.0078), and health goals (p=0.049) with a trend towards improvement compared to Baseline (p=0.082 (diet); p=0.066 (exercise); p=0.060 (goals)).

The highest absolute rates of documentation were seen with Intervention 2 for patients with prediabetes: documentation reached 92% for diet, 75% for exercise, and 58% for health goals.

Improvements in the quality of documentation were seen with both Intervention 1 and Intervention 2. More student progress notes from Intervention 1 and Intervention 2 documented details such as 24-hour diet recall, daily consumed beverages, and access to healthy food, compared to Baseline (data not shown).

## Conclusions

This study sought to evaluate the effects of two approaches for increasing rates of documentation of lifestyle modification and patient health goal discussions by student clinicians. We found that both EMR-based and student teaching-based interventions promoted documentation of these discussions. EMR-based templates provide a mechanism for standardizing and improving the quality of the documentation. Student clinician leaders have a key role in teaching others about the importance of lifestyle modification discussion and providing in-clinic reminders to highlight patients who may benefit from such discussions. Providing additional training to students about nutrition counseling and motivational interviewing and having such trained students as additional resources in clinic can help to make these discussions more routine and less

***Figure 2.*** Selected Results from the Needs Assessment (n=39)

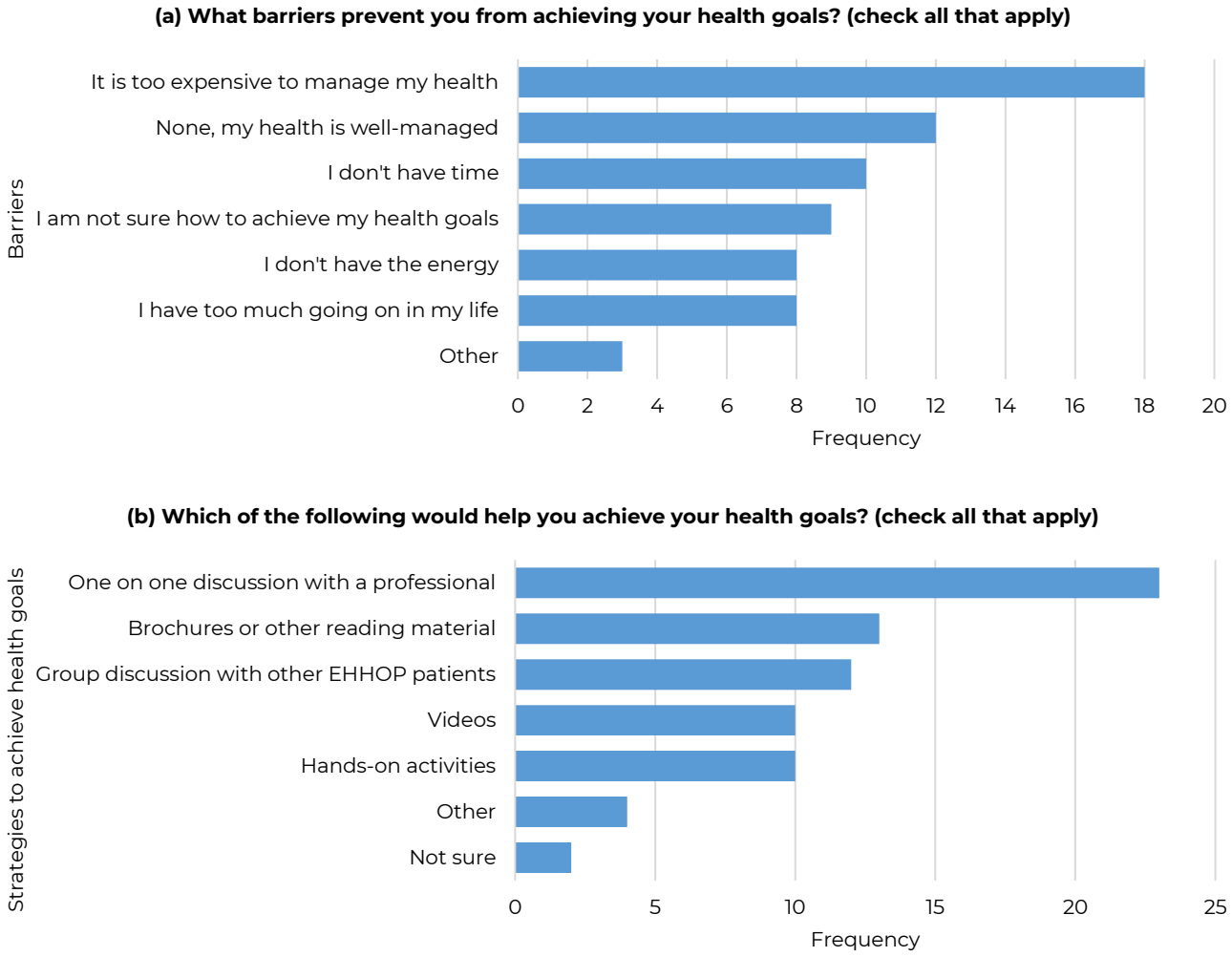
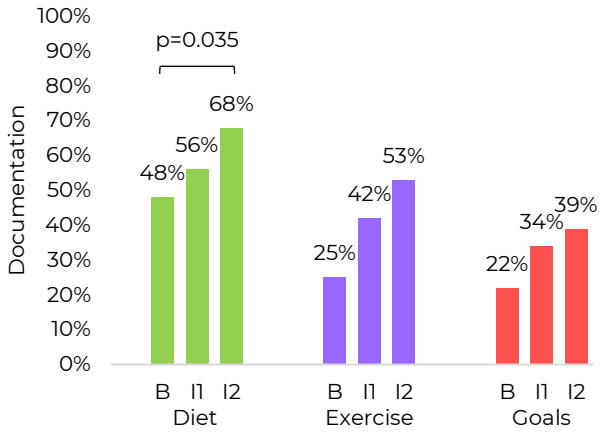



***Table 1.*** Patient Characteristics

| | Baseline (n=54) | Intervention 1 (n=50) | Intervention 2 (n=57) | P-value |
|---|---|---|---|---|
| **Diabetes status** | | | | |
| No diabetes | 33% | 42% | 40% | 0.73 |
| Prediabetes | 26% | 24% | 21% | 0.89 |
| Diabetes | 41% | 34% | 39% | 0.65 |
| **Type of visit** | | | | |
| New | 9% | 12% | 12% | 0.85 |
| Quick visit | 24% | 22% | 16% | 0.72 |
| Return | 67% | 66% | 72% | 0.64 |
| **Chronic Care** | 44% | 38% | 51% | 0.35 |

***Figure 3.*** Percentage of visits with documentation of diet, exercise and health goals at Baseline (B), Intervention 1 (I1), and Intervention 2 (I2)




burdensome. Multi-pronged systemic efforts that incorporate all these components of technology, teaching, and training are essential to ensure the sustainability of these changes in practice.

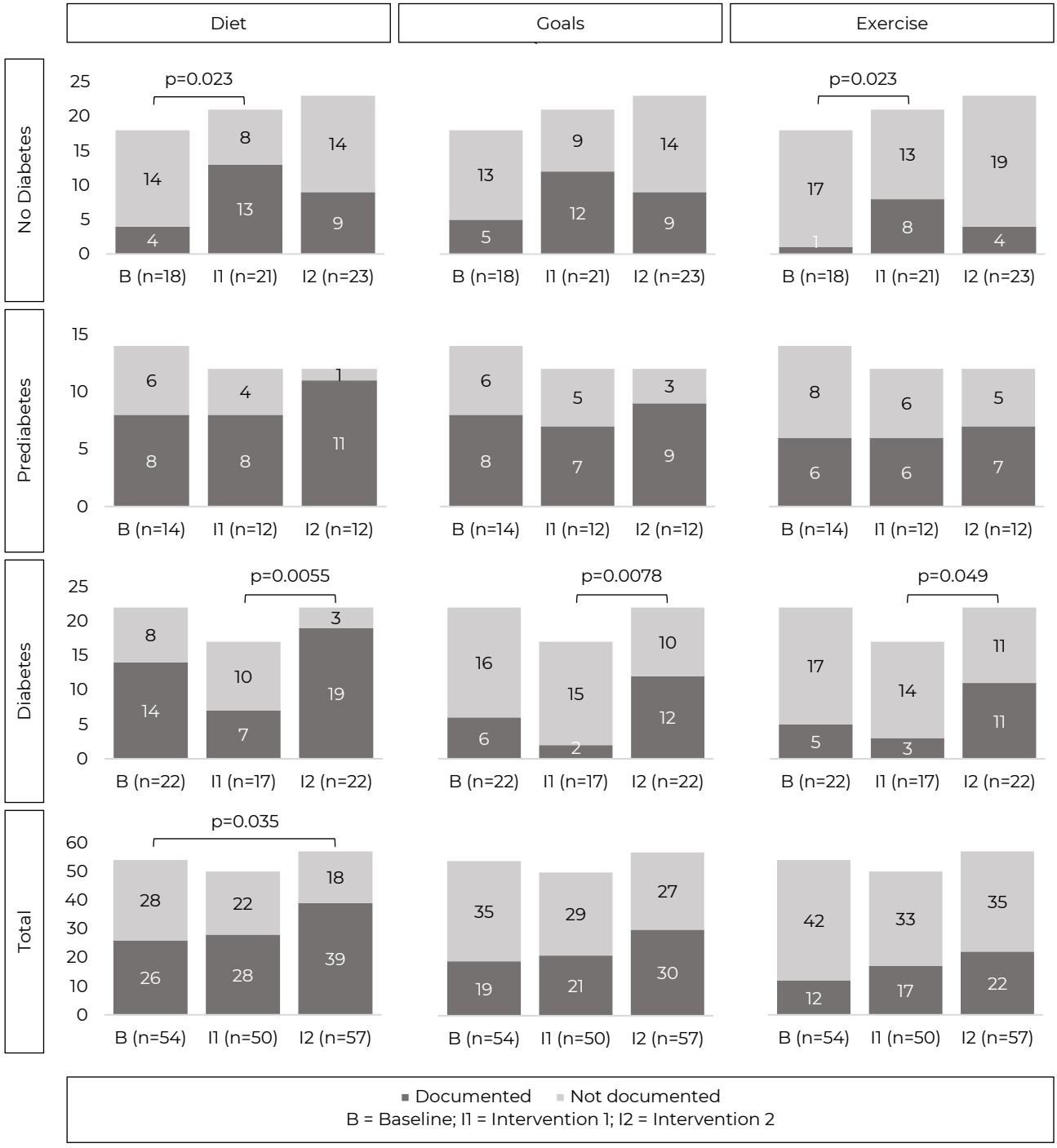
In the EHHOP clinic, patients with prediabetes were most likely to have diet, exercise and health goals discussed and documented in their charts. This may stem from the clinician's perception that engaging patients at this stage has the greatest potential to halt progression to overt disease. Alternatively, this may be an indication of the lower complexity of the visit itself, as patients with prediabetes often have fewer comorbidities and utilize less pharmacotherapy compared to patients with diabetes. The shorter, lower complexity visits could also better allow for the opportunity to discuss lifestyle modification, and students were more able to do so as they were equipped with the Smartphrases and clinical support. For patients with diabetes, the complexities of managing blood glucose, adhering to complex pharmacotherapy regimens, and coordinating comorbidities such as renal disease, hypertension, and neuropathic pain, may make lifestyle discussions seem of lower priority or achievability. Interestingly, in patients with diabetes, student teaching-based Intervention 2 was significantly more helpful than EMR-based Intervention 1 in improving lifestyle modification documentation rates. This suggests that while time constraints in taking care of complex patients may cause student clinicians to overlook lifestyle modification counseling, such constraints may be overcome when clinician leaders prioritize patients for counseling in conjunction with the availability of trained nutrition counselors.

These findings highlight the opportunity to train student clinicians about the importance of discussing and documenting lifestyle modification at any point in the disease course of diabetes. These discussions may help to improve health literacy and patient satisfaction.[9] Furthermore, helping patients incorporate healthier lifestyle changes can improve their management of chronic disease and decrease their pharmacotherapy needs, which ultimately leads to decreased costs and enhanced patient outcomes.

The findings of this study support the idea that EMR-based interventions, such as standardized screening and documentation protocols in the EMR, could help to promote healthy lifestyle changes, particularly in patients without diabetes who may be viewed as otherwise healthy. Overall, student teaching-based initiatives are also needed, rather than EMR-based initiatives alone, in order to promote lifestyle modification discussion and documentation in all patients, particularly those with chronic medical conditions.

Limitations of this study that must be considered are as follows: The needs assessment survey was administered differently based on patient preference with respect to whether the survey was read to them versus whether they read it themselves. This difference creates the potential for bias based on survey administration methodology. While this flexible means of survey administration allowed for an increased number of participants given potentially variable patient literacy levels and availability of in-clinic translators, the effect of this difference in administration is not analyzed here. Furthermore, this study is a non-randomized study, which has inherent limitations in its ability to generalize to the general population, reduce bias and confounding factors, and demonstrate causality. Due to the small sample size, this study may have been underpowered to detect smaller changes in documentation rates. Our study used documentation rates as the primary outcome to measure changes in student clinician behavior. While documentation is essential for ensuring effective patient follow-up, it

***Figure 4***. Percentage of patient visits with diet, exercise, and health goal documentation, stratified by patient diabetes status




may not always accurately represent the actual discussion that occurred with the patient during the clinical encounter and is limited in its capacity as a surrogate marker for quality of counseling. In addition, although the quality of documentation was evaluated based on inclusion of specific criteria such as 24-hour diet recall and access to healthy food, these criteria may not fully assess

other qualities of discussion that can differ among encounters, such as length of time or patient engagement. During Intervention 2, the Nutrition Corps were available in clinic. These were students who were specifically trained in nutrition counseling, and the ability to refer patients to Nutrition Corps may have decreased the likelihood that the main student clinicians would discuss and document lifestyle modification with their patients. The Nutrition Corps wrote separate patient notes in the EMR that were not included this study. Ultimately, having this additional resource in clinic was likely beneficial in achieving the objective of increasing discussion and documentation of lifestyle modification by any student clinician. Finally, there was no post-intervention survey, which could have provided a valuable comparison for the effects of the interventions on patient perspectives.

In summary, EMR- and student teaching-based interventions are effective at promoting behavioral change in student clinicians to increase documentation rates of lifestyle modification discussions. Further studies are needed to evaluate the effect of increased lifestyle modification documentation rates on patient satisfaction and health outcomes, perhaps through surveys of patient perceptions of the counseling. One possibility to promote sustainable behavioral change is to incentivize students to prioritize lifestyle modification counseling instead of immediately looking to make changes in medication doses. SRFCs may consider team challenges that reward student clinicians who successfully incorporate lifestyle changes over pharmacotherapy when appropriate. Education and training are critical components of promoting this shift in student clinicians' behaviors and should seek to engage students in a discussion of the high cost of medical therapies and how to incorporate cost-effective strategies such as lifestyle modification counseling into clinical practice.

#### Disclosures

The authors have no conflicts of interest to disclose.

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