



From the Patient's Perspective: The Impact of Training on Resident Physician's Obesity Counseling

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BACKGROUND: It is uncertain whether training improves physicians' obesity counseling.

OBJECTIVE: To assess the impact of an obesity counseling curriculum for residents.

DESIGN: A non-randomized, wait-list/control design.

PARTICIPANTS: Twenty-three primary care internal medicine residents; 12 were assigned to the curriculum group, and 11 were assigned to the no-curriculum group. Over a 7-month period (1–8 months post-intervention) 163 of the residents' obese patients were interviewed after their medical visits.

INTERVENTION: A 5-hour, multi-modal obesity counseling curriculum based on the 5As (Assess, Advise, Agree, Assist, Arrange) using didactics, role-playing, and standardized patients.

MAIN MEASURES: Patient-report of physicians' use of the 5As was assessed using a structured interview survey. Main outcomes were whether obese patients were counseled about diet, exercise, or weight loss (rate of counseling) and the quality of counseling provided (percentage of 5As skills performed during the visit). Univariate statistics (*t*-tests) were used to compare the rate and quality of counseling in the two resident groups. Logistic and linear regression was used to isolate the impact of the curriculum after controlling for patient, physician, and visit characteristics.

KEY RESULTS: A large percentage of patients seen by both groups of residents received counseling about their weight, diet, and/or exercise (over 70%), but the quality of counseling was low in both the curriculum and no curriculum groups (mean 36.6% vs. 31.2% of 19 possible 5As counseling strategies, $p=0.21$). This difference was not significant. However, after controlling for patient, physician and visit characteristics, residents in the curriculum group appeared to provide significantly higher quality counseling than those in the control group (std $\beta=0.18$; R^2 change=2.9%, $P<0.05$).

CONCLUSIONS: Residents who received an obesity counseling curriculum were not more likely to counsel obese patients than residents who did not. Training, however, is associated with higher quality of counseling when patient, physician, and visit characteristics are taken into account.

KEY WORDS: obesity; counseling; results.

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INTRODUCTION

The majority of Americans are either overweight or obese¹ and obesity is associated with higher mortality² and increased risk of co-morbidities.^{3–5} Modest weight loss with diet and exercise can improve health outcomes.⁶ Physician counseling is associated with improved diet and physical activity,⁷ readiness for lifestyle change,⁸ and short-term weight loss.^{9,10} Thus, several organizations recommend that physicians should counsel obese patients to lose weight^{11–13}.

However, physicians often do not counsel patients about their weight.^{7,14–16} When counseling does occur, most physicians do not discuss specific behavior change recommendations such as diet and exercise,⁸ indicating that quality of counseling may be poor. Lack of training and competency in obesity management are among the reasons that physicians do not adequately counsel patients.^{8,17–19}

The 5As counseling framework is an evidence-based way to teach physicians to counsel obese patients^{19,20} and measure the quality of obesity counseling.²¹ This framework guides providers to assess risk, current behavior, and readiness to change, advise change of specific behaviors, agree and collaboratively set goals, assist in addressing barriers and securing support, and arrange for follow-up.^{20,22} Training physicians about this framework has been shown to improve patient outcomes in smoking cessation.²³ When combined with office management strategies, training physicians to perform the 5As produced greater lipid control and weight loss⁹ in patients. We, therefore, used the 5As framework to design and evaluate our obesity curriculum.

The goal of this pilot study was to measure the impact of an obesity counseling curriculum on resident physicians' obesity counseling, operationalized as the use of 5As counseling strategies. In our conceptual model, we anticipated that selected patient (BMI, health status, stage of change, and overall satisfaction with the clinic), visit (degree of continuity, whether

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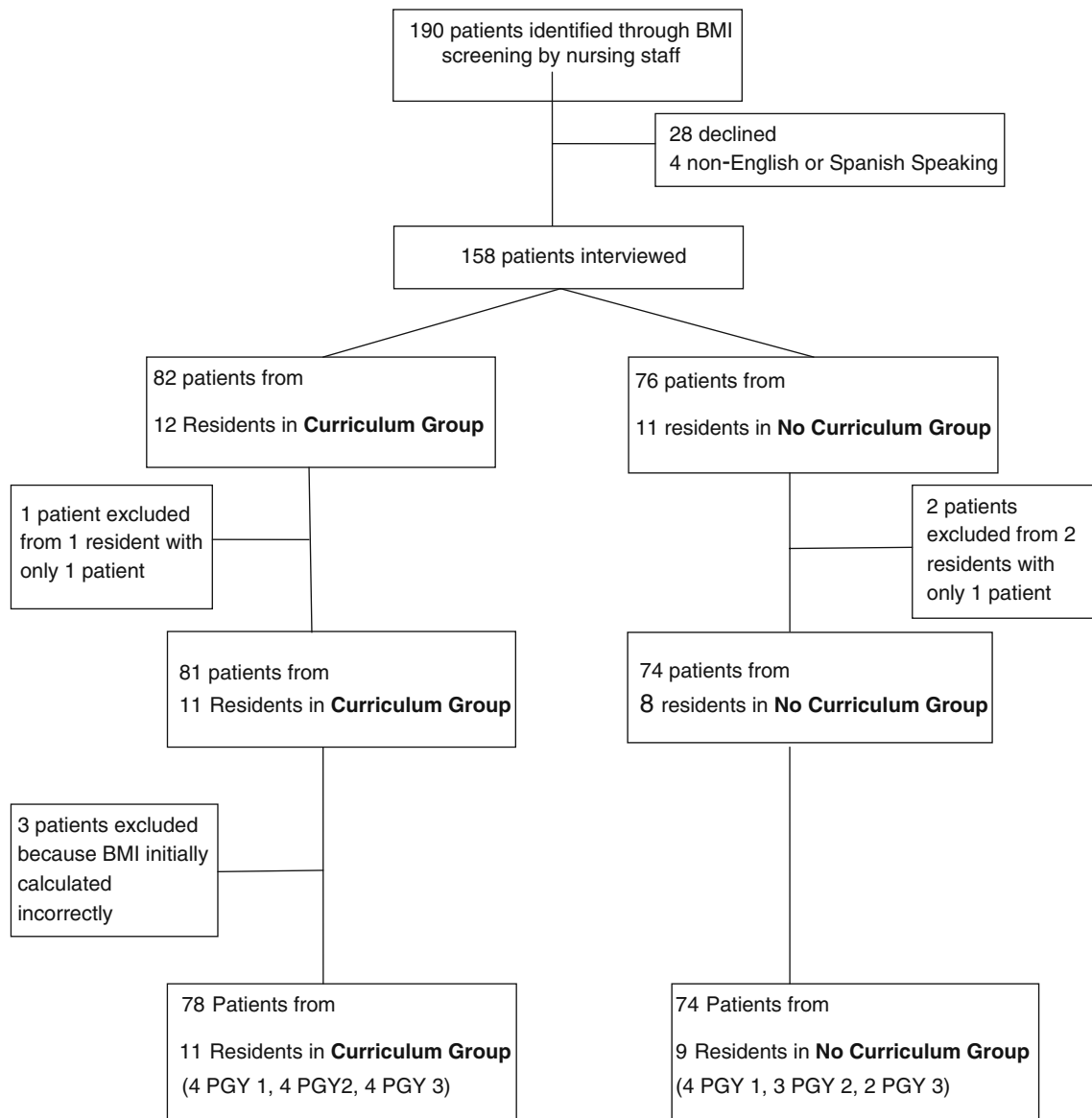
physician was primary provider), and physician characteristics (gender, patient-centeredness) would be important confounding influences on physicians' obesity counseling. Thus, we sought to compare the patient-reported rate and quality of counseling of residents who did and did not participate in an obesity counseling curriculum while controlling for these potential confounders.

METHODS

Participants: Residents

We used a non-randomized, wait-list/control design to examine the impact of the obesity curriculum on physicians' obesity

counseling. We included all 23 resident physicians in the primary care residency program in this study; all had consented to be part of a medical education research registry approved by the IRB at New York University. These residents were stratified by year of training and assigned to either an intervention (curriculum) group or control group (no curriculum) based on their rotation schedule, determined independently and a priori by an outside administrator blinded to the study (See Fig. 1). Residents entering their outpatient rotation at the beginning of the study (February 2008) were placed in the intervention group, and those entering their rotation later (March 2008) were placed in the control group and received the curriculum after the intervention ended. While the residents were not blinded to the intervention, they were not told that this specific curriculum was being studied.



*Patients with a BMI >29.5 or a BMI > 27 with 2 or more co-morbidities were kept in the analysis to preserve sample size

Figure 1. Patient and physician flow chart.

Intervention: Obesity Curriculum for Residents

The 5-hour curriculum, given over three weekly sessions, utilized multiple active instructional methods including case-studies, role-playing, standardized patients for counseling practice, and faculty-facilitated videotape review of residents counseling their own patients. Skills such as behavioral assessment, goal setting, and motivational interviewing were stressed¹⁹. Participation was monitored using attendance forms.

Measures: Body Mass Index

Weight was measured using one of four analog scales each equipped with a stadiometer to take height measurements with the patients fully clothed except for shoes and jackets. The scales were calibrated at the start of the study.

Patient Exit Interview

We developed a questionnaire to evaluate the rate and quality of physician counseling in English and Spanish. It was designed to be read by a research assistant and asked patients to indicate whether the physician used each of nineteen literature-derived 5As counseling skills^{20,22} (See Table 1). We have used similar items in observed structured clinical exams (OSCEs) to evaluate physician performance and have found the assessment to have adequate internal consistency (Cronbach’s alpha >0.75). Based

on these OSCEs and a needs assessment of faculty and residents¹⁹, we identified 11 items reflecting more advanced skills (Table 1).

We also measured theory-based patient, provider, and visit characteristics based on our conceptual model. Patient factors included BMI, socio-demographic information, perceived health status, presence and number of self-reported co-morbidities (diabetes, high cholesterol, hypertension, arthritis), health literacy, and patient stage of weight management change. Stage of change questions were adapted from previously used questionnaires.²⁴ Health literacy was assessed using two literature-derived screening questions.²⁵ We assessed patients’ overall satisfaction with clinic services using 6 items from frequently used satisfaction questionnaires²⁶ with fairly strong evidence of reliability (internal consistency and test-retest) and validity (e.g., associations with adherence, doctor shopping, disenrollment from health plans).²⁷

Visit characteristics included a measure of continuity (estimated number of times the patient had seen the physician with 0=never; 1=once; 2=2–3 times; 4=4–10 times; 5=11–20 times; 6=more than 20 times) and whether the patient considered the physician to be his or her primary care provider. Time since the intervention (measured in weeks) was included to control for seasonal (patient) and developmental (resident experience and training, decay of curriculum impact) effects. The provider characteristics included gender and physician’s patient-centeredness of care which was assessed with seven questions adapted from the RAND Patient

Table 1. Assessment of 5As Obesity Counseling Practices

	Asses	Advise	Agree	Assist	Arrange
Basic skills	Did you and your doctor discuss your weight today? Did your doctor ask you about or discuss your diet (what you eat today) Did your doctor ask you about or discuss how you exercise today Did your doctor ask you if you’re trying to lose weight?	Did your doctor discuss with you how much weight you should lose? Did your doctor tell you that you should lose weight	Did your doctor help you set goals (make specific plans) to improve your diet and (or) exercise more?		Did your doctor tell you when he or she wanted to see you again for follow-up (within 30 days)
Advanced skills	Did your doctor ask you to recall all the food and drinks you’ve had in the past 24 hours Did your doctor ask you know important it is to you to try and lose weight? Did your doctor ask you how confident you are that you can lose weight?	Did your doctor discuss making changes in your diet with you today? Did your doctor discuss making changes in how much you exercise	How much were you involved in setting these goals? How realistic do you think it is that you’ll meet these goals?	Did your doctor talk with you about how to deal with the kinds of things, like stress, temptation, finding time that make it hard for you to lose weight	Did your doctor refer you to the weight management clinic? Did your doctor refer you to any community supports like Overeater’s Anonymous Did your doctor refer you to a nutritionist?
19 Items TOTAL	7 Items	4 Items	3 Items	1 Item	4 Items

Satisfaction Questionnaire²⁷ and the OPTION shared decision-making scales.²⁸

We piloted the survey with 20 patients in both Spanish and English to ensure that the questions were understandable, culturally appropriate, and accurately translated.

Patients and Procedures

The residents see patients at Gouverneur Healthcare Services, part of the New York City Health and Hospitals Corporation (HHC). Gouverneur serves a largely low income, underserved immigrant population (45% Hispanic (HHC internal document, August 2008)).

Fifteen nursing staff identified all patients seen by residents with a BMI ≥ 30 using a BMI measurement wheel. Bilingual research assistants approached patients immediately after their medical visit to invite them to be part of the study. Research assistants obtained verbal consent using a consent script (to accommodate low literacy patients). They then conducted the 15–30 minute interview in a separate room after explicitly stating that the physicians would be informed about patients' answers. The patient interviews were conducted 1–8 months after the residents received the curriculum. Patients received a pedometer (estimated value \$3.15) as compensation. The Institutional Review Boards at New York University School of Medicine and Gouverneur Healthcare Services approved this study.

Statistical Analyses

Sample Size Calculations. A priori power calculations were based on an anticipated 25% difference in the rate of obesity counseling between the intervention and control groups, adjusted for possible clustering effects²⁹. With the number of clusters (residents) fixed at 23, we calculated that we would need a minimum of five patients per resident (115 patients) to have minimum power (0.80) to detect this difference in the rate of obesity counseling assuming relatively large (e.g. conservative) intra-class correlations (ICCs) of up to 0.10.

Analysis. Our two main outcomes were rate of obesity counseling (patients who indicated that they were counseled about their weight, diet, and/or exercise were counted as 'counseled') and the quality of counseling using a 5As counseling score (calculated as the % of 19 individual 5As counseling strategies used) and an Advanced Skills Score (calculated as the % of 11 higher-level counseling strategies used). We used *t*-tests and chi-square statistics to assess the significance of differences between the curriculum groups in rate and quality of counseling.

Multivariate analyses assessed the impact of the curriculum on the rate of counseling (logistic regression using dichotomous counseled or not as the dependent variable) and quality of counseling (linear regression using counseling scores as dependent variables) after controlling for selected patient, visit, and provider characteristics (listed in Table 4). Independent variables were chosen based on findings of significant or nearly significant differences between intervention and control groups in order to control for the non-randomness of our design and on theory suggesting direct associations with obesity counseling

(e.g., BMI, health status, and number of co-morbidities of the patient). Given the number of variables in our model, we report *adjusted R*².

All analyses were based on an intention-to-treat model; patients of residents in the curriculum group who did not complete the curriculum were included in the analysis.

RESULTS

See Fig. 1 for the resident and patient flow chart. Of the 12 residents in the curriculum group, 11 (92%) completed the full curriculum. Four patients spoke neither English nor Spanish and were thus ineligible. Twenty-eight patients declined to participate mostly due to time constraints. Thus, we interviewed 158 patients. The average number of patients per resident was 7 (range 2–15; three residents who each saw only one patient were excluded). Twenty-one of the patients interviewed had a BMI less than 30 (26–29.99) due to inappropriate referrals and/or BMI calculation errors by staff. Of these, we chose to include patients who had a BMI that rounded to a whole number ≥ 30 or ≥ 27 with diabetes or two or more co-morbidities (as per NIH guidelines³⁰ in order to preserve sample size.

Table 2 shows the patient characteristics in the control and intervention groups. Overall, the majority of the patients were female, Hispanic, Spanish-speaking, and of low health literacy. The intervention group patients were less likely to report being in the action or maintenance stage of change and were less satisfied with their clinic experience. More time had elapsed since the intervention for the control group by design—intervention residents were on their outpatient rotations earlier where they see more patients.

Table 3 shows the percentage of patients counseled about weight, diet, and/or exercise in each group as well as the quality of counseling scores (5As Counseling Score and Advanced Skills) at both the resident and patient levels. For the patient-level data, the 5As counseling score is also broken down by each of the 5As categories. We found no differences in counseling rates—all residents counseled a large percent of patients (72%). While the intervention group consistently used more 5As counseling practices, these differences were not statistically significant. The Cohen's *d* for the 5As counseling score and advanced skills score indicate small effects (0.20 and 0.27, respectively). Clustering effects were much smaller than we estimated for our main outcome (counseling rate-ICC=0.01) and core patient characteristics (ICCs for: BMI=0.01, self-rated health=0.01, age=0.03, gender=0.02), we did find a larger clustering effect for patient speaking Spanish (ICC=0.21). More residents in the curriculum group (5/12) than the no curriculum group (1/9) saw only Spanish-speaking patients; although the total percent of Spanish-speaking patients did not differ significantly between the intervention groups. Language-related cluster effects could be expected given that Spanish-speaking patients tend to see Spanish-speaking residents. To test whether this clustering effect impacted our results, we compared the main outcomes for residents with only Spanish-speaking patients to those with patients of mixed language and found no significant differences. These ICCs suggest that much of the variation is associated with patients rather than residents and support our decision to conduct analyses at the patient level, controlling for key covariates.

Table 2. Patient and Physician Characteristics

	Control Group (no curriculum)	Intervention Group (curriculum)	t-test or Chi Sq	p
PATIENT CHARACTERISTICS	n=74	n=78		
BMI, mean, (SD)	34.50 (4.61)	33.83 (3.86)	t=1.01	0.31
Sociodemographics				
Age mean, (SD)	43.50 (13.45)	46.11 (13.73)	t=1.19	0.24
Female gender, No., (%)	54 (73)	55 (71)	$\chi^2=0.08$	0.77
Race/Ethnicity				
Hispanic, No. (%)	54 (73)	66 (85)	$\chi^2=4.16$	0.13
Black, No. (%)	15 (20)	7 (9)		
Spanish speaking, No. (%)	50 (68)	61 (78)	$\chi^2=1.97$	0.16
Low health literacy, No. (%)	40 (54)	45 (58)	$\chi^2=0.27$	0.60
Health Characteristics of Patients				
Number co-morbidities, mean, (SD)	1.81 (1.62)	1.84 (1.48)	t=0.10	0.92
Report being obese, No. (%)	36 (49)	40 (52)	$\chi^2=0.16$	0.69
Self-report health status ^a (mean, SD)	3.54 (1.16)	3.46 (1.04)	t=0.44	0.66
Patients' Stage of Change				
% action or maintenance, No. (%)	66 (89)	60 (77)	$\chi^2=3.88$	0.05
Patient Satisfaction				
Satisfaction with clinic, mean ^b , (SD)	3.56 (0.37)	3.44 (0.39)	t=1.99	0.05
PHYSICIAN/VISIT CHARACTERISTICS				
Patient-centeredness of MD ^c , mean, (SD)	3.86 (0.25)	3.78 (0.31)	t=1.68	0.09
Consider MD to be primary care MD, No. (%)	52 (70)	62 (80)	$\chi^2=1.98$	0.16
Continuity (times seen MD) ^d , mean, (SD)	0.84 (1.09)	1.10 (1.21)	t=1.40	0.16
Female, No. (%)	34 (46)	42 (54)	$\chi^2=1.10$	0.29
Gender concordance, No. (%)	38 (51)	41 (53)	$\chi^2=0.05$	0.82
Time (wks since intervention), mean No. (%)	11.21 (6.32)	9.22 (5.76)	t=2.05	0.04

^aOverall, how would you rate your health during the past four weeks—6 point scale: Very poor, poor, fair, good, very good, excellent?

^bHow satisfied are you with the medical care you receive at this clinic?—4 point scale: Not at all, only a little, somewhat, very satisfied

^cAverage of 7 questions from two questionnaires^{27,29}

^dHow many times have you seen this Dr. before today?—0=First Time, 1=Once, 2=2 or 3 times, 4=4 or more times

In the multivariate analyses, we found small but significant effects of the intervention on quality of counseling but not on the rate of counseling. Being seen by a resident in the curriculum group was not significantly associated with increased likelihood of being counseled (OR=1.94, CI .80-4.68, $p=0.14$) (not tabled). Patient's BMI (OR=1.12; CI 1.01-1.24 $P=0.04$), stage of change (OR=3.54; CI 1.24-10.16, $P=0.02$), and continuity (OR=1.49; CI 1.03-2.15, $P=0.03$) were associated with increased odds of being counseled.

Table 4 shows hierarchical linear regression models with 5As counseling score and advanced skills score as the dependent variables. Being seen by a resident in the curriculum group was

associated with receiving higher quality of counseling in both models. The standardized beta of 0.18 for participation in the curriculum suggests that, while controlling for co-variables, receiving the curriculum is associated with about a 5% increase in quality of counseling (or using approximately one additional 5As counseling practice). Other factors associated with higher quality of counseling of similar magnitude included higher BMI, better health, and having female and patient-centered providers. Factors that were negatively associated with quality of counseling included being a female patient and considering the physician to be one's primary care provider. We found similar results when advanced skills score was the dependent variable.

Table 3. Patient Report of Physician Obesity Counseling Performance

	Control Group (no curriculum) Mean (SD)	Intervention Group (curriculum) Mean (SD)	t-test	P
Patient level analyses	74 Patients	78 Patients		
Patients counseled about obesity, No. (%)	53(72)	57(73)	0.20	0.84
Overall counseling score, mean % of 19 5A counseling skills (SD)	31.2% (26.7%)	36.6% (27.9%)	1.27	0.21
Assess (7 items)	38.2% (35.0%)	46.7% (37.8%)	1.45	0.15
Advise (4 items)	36.2 (35.2%)	46.0% (34.2%)	1.67	0.10
Agree (3 items)	18.7% (34.7%)	26.8% (41.5%)	1.28	0.20
Assist (1 item)	16.4% (22.4%)	22.4% (41.9%)	0.91	0.36
Arrange (4 items)	21.3% (20.0%)	20.0% (23.9%)	0.33	0.74
Advanced counseling score (mean % of 11 advanced 5A counseling skills)	27.4% (30.2%)	35.9% (33.0%)	1.67	0.10
Resident Level Analyses	9 Residents	11 Residents	t-test	P
Mean % of patients counseled about obesity (at all)	74.0% (16.1%)	75.4% (18.2%)	0.19	.86
Mean overall counseling score (% of 19 5A counseling skills)	29.3% (10.7%)	31.9% (15.7%)	0.44	.67
Mean advanced counseling score (% of 11 advanced 5A counseling skills)	29.1% (16.9%)	32.5% (18.0%)	0.44	.66

Table 4. Hierarchical Regression Analyses with 5As Obesity Counseling Score and Advanced Skills Score as Dependent Variables

Independent variables	5As Counseling Score		Advanced Skills Score	
	Std Beta	R ² (Adj) Change	Std Beta	R ² (Adj) Change
PATIENT CHARACTERISTICS				
BMI	0.24 †	2.2%	0.21*	1.3%
Health status				
Self Report of health status (Better)	0.18*	5.6% †	0.19*	6.5% †
Sociodemographics				
Spanish (primary language)	-0.00	3.4%	-0.02	3.8%*
Gender (female)	-0.20*		-0.21 †	
Stage of change				
Stage of change (% in action or maintenance)	0.11	0.1%	0.09	0.3%
Patient satisfaction				
Satisfaction with clinic services	0.01	0.0%	0.04	0.1%
PHYSICIAN/VISIT CHARACTERISTICS				
Patient centeredness of MD	0.25 †	9.9% †	0.22 †	10.2% †
Considered primary care MD	-0.26 †		-0.25 †	
Continuity (times seen MD)	0.24 †		0.27 †	
Female physician	0.17*	3.2%*	0.17*	3.3%*
Time (Wks since intervention)	-0.12	1.7%	-0.10	1.4%
CURRICULUM IMPACT				
Resident completed obesity counseling curriculum	0.18*	2.9%*	0.21 †	3.9% †
	Total adjusted R ² =22.9%‡		Total adjusted R ² =24.3%‡	

**P*<0.05, †*P*<0.01, ‡*P*<0.001

DISCUSSION

While a majority of patients in our study reported being counseled, their physicians did not address most of the 5As, thus confirming the need to improve physicians' quality of obesity counseling.⁸ Our study did not find significant bivariate differences in obesity counseling between residents in the intervention and control groups. However, when theoretically-supported patient, visit and provider characteristics were taken into account, the obesity counseling curriculum was associated with higher quality of counseling. This is encouraging given the challenges of determining the direct effects of training on clinical care and supports efforts to train physicians to deliver high quality obesity counseling. This study also highlights that there are many factors besides physician training that influence the quality of care a patient receives.

Patients with a higher BMI were more likely to receive counseling. This is not surprising since both patients and physicians are more likely to identify obesity as a problem when patients weigh more.³¹ Higher self-reported health status was associated with higher quality physician counseling which supports previous work showing that counseling is most likely to take place when there are fewer competing issues.³² Having a female physician was associated with higher quality of obesity counseling; female physician gender has been shown to predict higher rates of preventive care counseling in other studies.³³ Greater continuity of care with the physician was associated with higher quality of counseling—physicians may have more time to counsel patients they have seen previously. Paradoxically, considering the physician to be one's primary care provider was associated with lower quality counseling—future research is needed to confirm and elucidate whether and why this might be true. Unfortunately, female gender of the patient was associated with decreased quality of obesity counseling. This is concerning and warrants further study because obesity is more common in females.¹

While this was a largely negative study, it has important strengths. We tested the impact of our curriculum on patient care. Few studies have examined the impact of medical education interventions on real-world physician performance³⁴ possibly because attempts to show a significant impact of medical education are hindered by the relatively small anticipated effect of curricula on outcomes³⁵ when compared to the myriad of other factors that impact patient care³². Further, we developed a conceptual model and used it to identify important variables which could be expected to influence obesity counseling. While our study did not account for all potentially important factors (e.g., year of resident training, patient activation, language and/or cultural concordance) it demonstrated the need to develop more nuanced models to better identify evidence of educationally sensitive variance in outcomes. This may guide the design of future medical education studies to capture the impact of training interventions on patient outcomes.

There are several limitations to this study. Given the small sample size, our study was underpowered to detect small differences. Residents who did not receive the curriculum may have learned from their peers in the intervention group, diminishing the measured differences between the groups. Generalizability is limited because we studied only one training program, although we anticipate using a more diverse sample of residents would yield substantially larger curriculum effects. Our residents had a higher rate of counseling in both groups than is reported in the literature (>70% vs. 20–30% in other studies (14, 31)), which may have produced a ceiling effect, diminishing the detectable difference between the two groups. Post hoc power calculations suggest that we would have needed a sample size of >700 to have minimum power (0.80) to detect the simple bivariate difference in quality of counseling we found between the curricular groups (about 5%).

There are also limitations in our study design and analysis. We could not randomize the residents to the intervention due to

fixed rotation schedules. While patients were blinded to intervention status, the residents were not. There may have been some variability in the quality and accuracy of weight and height measurements. The study was cross-sectional, and by not collecting data from multiple visits, we may have missed important curriculum effects. Our findings may not hold up with different patient populations although we suspect that many of the same core patient and visit characteristics will be important.

Our measures are also limited. Ideally, we would have liked to have assessed more physician and visit characteristics but were limited both by the availability of data (determined by respondent burden and resource constraints) and by our small sample size which precluded the inclusion of too many variables. We relied on patient report to assess the quality of obesity counseling which may have produced a recall bias. While patient report has been shown to be superior to physician report and chart reviews as a method to assess physician practice³⁶, we cannot determine the accuracy of patient reporting in our study.

This study suggests avenues for further research. We plan to test the impact of this obesity curriculum using larger numbers of residents from multiple institutions. We also plan to conduct longitudinal follow-up of patients to see if training physicians to deliver higher quality obesity care leads to improved outcomes such as patient activation, intention to lose weight, and weight loss.

CONCLUSIONS

A multi-modal obesity counseling curriculum using the 5As is associated with higher quality of obesity counseling after controlling for patient, visit, and provider factors in underserved patients. Future research should determine whether training physicians improves obesity care in a larger, more heterogeneous sample of physicians and patients.

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