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Effects of counseling techniques on patients' weight-related attitudes and behaviors in a primary care clinic

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Abstract

Objective—Examine primary care physicians' use of counseling techniques when treating overweight and obese patients and the association with mediators of behavior change as well as change in nutrition, exercise, and weight loss attempts.

Methods—We audio recorded office encounters between 40 physicians and 461 patients. Encounters were coded for physician use of selected counseling techniques using the Motivational Interviewing Treatment Integrity (MITI) scale. Patient motivation and confidence as well as Fat and Fiber Diet score (1 to 4), Framingham Physical Activity Questionnaire (MET-minutes), and weight loss attempts (yes/no) were assessed by surveys. Generalized linear models were fit, including physician, patient, and visit level covariates.

Results—Patients whose physicians were rated higher in empathy improved their Fat and Fiber intake 0.18 units (95% CI 0, 0.4). When physicians used "MI consistent" techniques, patients reported higher confidence to improve nutrition (OR 2.57, 95% CI 1.2, 5.7).

Conclusion—When physicians used counseling techniques consistent with MI principles, some of their patients' weight-related attitudes and behaviors improved.

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Practice Implications—Physicians may not be able to employ formal MI during a clinic visit. However, use of counseling techniques consistent with MI principles, such as expression of empathy, may improve patients' weight-related attitudes and behaviors.

Keywords

Patient-centered counseling; Weight loss; motivation; confidence; nutrition; exercise

1. Introduction

Overweight and obese patients who increase physical activity, eat healthier, and lose weight achieve improved health outcomes (1-3). Evidence indicates that when physicians provide intensive counseling, patients are more likely to change behaviors like diet and exercise (4,5). Such behavior change alone, even in the absence of weight loss, improves survival (6). Accordingly, the current guidelines for clinical management of obesity recommend that physicians counsel patients about weight loss, nutrition, and exercise (7).

However, physicians encounter many barriers related to counseling. They do not think their counseling is effective, in part because they feel that they have not had appropriate training to counsel patients about lifestyle changes and weight loss (8). Physicians also often cite their patients' ambivalence about changing behaviors as a reason not to provide counseling. Many patients know about the health risks of obesity; yet, many have low motivation to make lifestyle changes (9). Finally, the guidelines may not be specific or operational enough.

To address patient motivation and ambivalence effectively, physicians might use patient-centered counseling, which stresses collaboration and partnership (10). A specific form of patient-centered counseling is Motivational Interviewing (MI). MI was developed to help build patient motivation through amplifying and resolving patient ambivalence and to strengthen patient self-efficacy. MI was introduced several decades ago as a technique for counselors treating patients with alcohol abuse. Since then, MI, implemented in a formal setting, has been studied and found to be effective in many chronic medical conditions with behavioral components, including overweight/obesity (11).

In an attempt to broaden the spectrum of MI use, investigators have modified the formal technique used by counselors to an adapted technique that can be used by primary care providers. This adapted technique employs use of "MI Spirit," which, like MI, incorporates a partnership between the physician and patient, avoids commanding language from the physician, and helps patients create their own plans to reach their own goals. Other components of MI and patient-centered counseling, in general, can also be incorporated, such as reflections and open-ended questions. Despite their "low intensity," use of these techniques, even by physicians without formal training, seems likely to be effective in helping patients lose weight in the short term (12). Because patients' motivation and confidence to change weight-related behaviors, along with actual behavior change, are important for continued weight loss and weight maintenance over the long-term (13,14), it is important to understand whether and how these attitudes respond to this type of physician counseling.

This study aims to determine whether use of select patient-centered counseling techniques, scored with the Motivational Interviewing Treatment Integrity (MITI) scale, is associated with patient confidence and motivation to improve nutrition, physical activity, and attempts to lose weight. Furthermore, we aim to determine whether use of these techniques can affect reported behavior change in diet and physical activity, as well as attempts to lose weight.

2. Methods

2.1 Data Collection and Recruitment

This study uses data collected through Project CHAT (Communicating Health: Analyzing Talk), which was approved by the Institutional Review Board at Duke University Medical Center. CHAT was a three-year, prospective, observational study that included audio-recorded data from patient/physician encounters for 461 overweight or obese patients. The study was conducted in community-based primary care clinics, 48% family practice and 52% internal medicine, in North Carolina. Both physician and patient participants were told the study was about preventive health; neither was told the study was specifically about weight. Furthermore, physician participants were not aware this study examined counseling techniques nor did they receive any guidance or information regarding counseling techniques, such as MI, prior to or as part of the study.

54 physicians were approached; 40 agreed to be in the study (74%). Fourteen refused for the following reasons: new to practice, recently recuperated from surgery, not enough patients, leaving practice soon, concerned about patient flow, and did not want to support research.

Patient participants were identified through the physicians' electronic schedules and were contacted prior to their clinic appointment by letter and phone. Among 9,841 patients identified, we randomly selected 3,615 for recruitment. Of these, 1,104 (31% of 3,615) did not enroll due to scheduling conflicts. Of the remaining potential participants, 910 (36% of 2,511) were ineligible due to: weight status (BMI<25), no reliable phone access, cognitive impairment, or other reasons; 434 (17% of 2,511) were unreachable prior to their scheduled clinic appointments. The remaining 1,167 (46% of 2,511) patients had the following outcomes: 530 (45% of 1,167) refused, 47 (4% of 1,167) were not able to complete the baseline survey, and 590 (51% of 1,167) patients completed the baseline survey. Of the 590, 129 did not have visits audio recorded, leaving 461 (78% of 590) with complete baseline data. Of these, 426 (92%) completed the three-month follow up survey.

CHAT staff audio-recorded each encounter and collected baseline and post-encounter survey data from each physician and patient participant. Data from patients and physicians were collected through patient and physician baseline and post-visit surveys. Additional survey data was collected for each patient participant at a three-month follow-up visit. Detailed methods of other data collection are described elsewhere (12).

2.2 Coding Counseling Techniques

Physician use of counseling techniques was assessed from audio-recorded encounters by two independent coders. No strongly validated measures of patient-centered counseling have been developed for weight loss counseling. Thus, we chose to assess techniques using the MITI, a validated scale developed to assess provider use of MI techniques. Two style measures and three specific techniques were measured, each using the MITI (15). The two global physician style measures, represented by 5-level Likert scales, were the following: 1) use of *Empathy*, and 2) use of *MI Spirit*. *Empathy* measured the extent to which the clinician appeared to understand and have an active interest in the patient's perspective and feelings. *MI Spirit* was the mean of three items: evocation (clinician focuses effort on elicitation of patient's ideas), collaboration (clinician treats the interaction as one between two equal partners), and autonomy (clinician supports patient perception of choice). Specific techniques were measured only for encounters in which weight-related discussion was identified and included use of the following: 1) open-ended questions (requires more than "yes"/"no" responses), 2) reflections (physician conveys understanding, with or without added meaning), 3) MI-consistent behaviors (asking permission, affirming, providing support, and emphasizing control), and 4) MI-inconsistent behaviors (advising without

permission, confronting, and directing). Some encounters included weight-related discussions that were not explicitly MI consistent or inconsistent, and these encounters were coded as “neither.”

Because of skewness and low variability in these measures, we dichotomized the scores for the analysis. MI Spirit was represented as “no MI Spirit,” for scores of 1 and “some MI Spirit,” for scores > 1. Empathy was transformed similarly. MI consistent behavior was dichotomized as MI consistent technique alone versus any inconsistent or neither.

2.3 Outcomes

The primary outcome measures were patient motivation and confidence to change, assessed for each of the three weight-related topics: nutrition, exercise, and weight loss. These were collected by survey at baseline and immediately following the audio-recorded encounter. *Motivation* was assessed using a 7-level Likert scale with the following question: “With 1 being ‘not at all,’ and 7 being, ‘very much,’ how much do you want to lose weight at this time?” *Confidence* was assessed with a 5-level Likert scale: “With 1 being ‘not at all,’ and 5 being, ‘very much,’ how confident are you that you can lose weight at this time?” Motivation and confidence to improve nutrition and increase exercise were measured similarly.

Because of skewness and little variability in motivation and confidence scores, baseline and post-visit motivation and confidence scores were dichotomized for analysis as follows: Motivated (5-7) or not motivated (1-4); confident (4-5) or not confident (1-3).

Secondary outcomes were nutrition, physical activity, and attempts to lose weight. Nutrition and exercise were measured at baseline and three months. *Nutrition* was assessed using the 22-item Fat and Fiber-related Diet Behavior Questionnaire (16,17). Questions about frequency of food selections included: “When you ate dessert, how often did you eat only fruit?” and “When you ate chicken, how often did you take off the skin?” Responses were averaged into a total score where “1” reflected higher fiber, lower fat food choices and a score of “4” reflected lower fiber, higher fat choices ($\alpha = 0.74$ at baseline and $\alpha = 0.77$ at three-month follow-up).

Physical activity was measured using the Framingham Physical Activity Index (18). Participants recalled the average number of hours spent engaged in various levels of occupational and leisure activity (sleep, sedentary, slight, moderate, and heavy) over a 24-hour period. From this, we estimated energy expenditure in MET-minutes (range 1440 – 7200). A score of 1440 represents 24 hours of sleep, while 7200 is 24 hours of heavy activity, such as running. *Attempted weight loss* was measured at three months with the question, “During the past three months, have you attempted to lose weight? (yes/no).”

2.4 Analysis

All analyses were performed using SAS software (SAS Institute, Inc., Cary, NC). The primary analysis examined the extent to which counseling techniques predict confidence and motivation, which may be considered mediators of behavior change. Secondary analyses examined association between use of counseling techniques and actual behavior change for nutrition, physical activity, and weight loss attempts. The analysis sample for both primary and secondary analyses using MI spirit, Empathy, and MI consistency was all encounters with associated baseline surveys and audio-recorded conversations (n=461). For both primary and secondary analysis of the other techniques (open questions and total reflections), analysis was performed using the subset of encounters in which weight discussion occurred (n=320) as these techniques were only recorded for weight-related discussions. For our primary analysis, association between use of counseling techniques and

the dichotomous post-visit motivation and confidence variables, we fit logistic regression models, adjusting for the baseline state of the outcome. We also fit logistic regression models, adjusting for covariates, to examine associations of counseling techniques with attempts at weight loss. For the secondary analysis, we used ANCOVA models to examine the association between use of counseling techniques and Fat and Fiber score and Framingham Physical Activity score adjusting for baseline scores as well as patient, physician and visit level variables.

Covariates were defined *a priori* based on their clinical and practical relevance to weight management, and included the following: patient demographics (gender, age, race, level of education, socioeconomic status), patient comorbidities (diabetes, hypertension, arthritis, hypercholesterolemia), whether the patient is actively trying to lose weight, patient BMI, physician factors (gender, race, medical specialty, years in practice, concern about reimbursement, confidence to counsel about weight, barriers to counseling, prior training with counseling, comfort with counseling), who initiated the weight loss discussion, explicit vs. implicit weight discussion, acute vs. chronic care visit, and total time spent discussing weight. Residual plots from ANCOVA models were examined to assess model assumptions and the effects of potential outlier observations.

3. Results

3.1 Sample characteristics

Table 1 shows the baseline characteristics for the 40 physicians and the 461 patients. The physician sample was 85% white, 40% male, and non-obese [mean BMI 24.9 (SD 4.0)]. The patient sample represented various demographic groups, with 66% white, 34% male, 67% educated beyond high school, and 52% with an annual income \$45,000. In each behavior category (nutrition, exercise, and weight loss), at least 58% of patients rated their baseline motivation 5 (scale 1 to 7). Furthermore, 53% of patients rated their motivation for weight loss at 7. In each behavior category, at least 50% of patients rated their confidence 4 (scale 1 to 5). Mean baseline Fat and Fiber score was 2.5 (SD 0.5), and mean baseline Framingham physical activity score was 1773 MET minutes (SD 236). 47% of patients reported active attempts at weight loss at baseline.

3.2 Frequency of counseling techniques

Despite the presence of weight-related discussion in 69% of encounters, global scores for MI Spirit and Empathy were low. For MI Spirit, 92% of encounters were scored 1, the lowest score. Similarly, 96% of encounters were scored 1 for Empathy. MI consistent techniques alone were seen in 10%. Among the encounters with weight-related discussion (n = 320), specific MI techniques were uncommon, with open questions observed in 38% and reflections in 38%.

3.3 Relationship between counseling techniques and motivation and confidence

There was not much change between baseline motivation and confidence and post-visit motivation and confidence in any of the three categories (nutrition, exercise, and weight loss). For motivation, 10%, 13%, and 7% of patients moving from “not motivated” to “motivated” between baseline and post-visit reports in the respective groups. Similarly, 14%, 13%, and 13% of patients moved from “not confident” to “confident.” Accordingly, there was no association between use of counseling techniques and post-visit motivation after adjustment for baseline motivation (Table 2). There were higher odds of post-visit motivation, with wide confidence intervals, in encounters with Empathy as compared to those without for nutrition (p=0.17), exercise (p=0.39), and weight loss (p=0.57). Similarly, there were higher odds of motivation with use of reflections by the physician, particularly

for improved motivation to lose weight ($p=0.08$). For post-visit confidence, use of MI consistent techniques was associated with higher odds of confidence to change nutrition ($p=0.02$), and similar trends were seen with confidence to exercise ($p=0.18$) and lose weight ($p=0.13$). No consistent associations were seen between use of MI Spirit or open questions and rates of change in motivation and confidence.

3.4 Relationship of counseling techniques and measures of nutrition, exercise, and attempted weight loss

Mean Fat and Fiber scores and Framingham physical activity scores were 2.38 (0.5) units and 1794.8 (198.6) MET-minutes, respectively, at the three month visit. Many (56%) of patients reported attempts to lose weight in the three-month interval between baseline and follow-up.

Expression of Empathy was associated with improvement (decrease) in Fat and Fiber scores (95%CI -0.36, 0.00; $p = 0.05$) after adjusting for baseline fat and fiber scores and patient, physician and visit level factors (Table 3). Use of MI consistent techniques was associated with an improvement of 76 MET minutes (95%CI 8, 144; $p = 0.03$) in Framingham score at 3 months in the fully-adjusted model. However, the residuals in this model were skewed, and there was an influential outlier in this analysis. As a sensitivity analysis, the Framingham scores were log transformed and models were fit, removing the influential outlier. The log transformation improved the distribution of the residuals; however, the outlier point remained influential to the results. When the influential point was removed, the effect decreased to 53 MET minutes (95%CI -8, 114; $p = 0.09$). We found no other use of counseling technique associated with change in Framingham exercise scores and no counseling techniques associated with attempts to lose weight.

4, Discussion and Conclusion

4.1 Discussion

Four findings merit discussion. First, overweight and obese patients in this sample, when presenting for a routine primary care visit, had high levels of motivation and confidence to change weight-related behaviors, and almost half were actively attempting weight loss. Second, physicians rarely used any patient-centered techniques in their weight loss discussions. Third, despite the overall paucity of expression of empathy, its presence was associated with improvement in Fat and Fiber scores as well as trends toward improvement in motivation scores and weight loss attempts. Finally, use of MI consistent techniques was associated with improvement in patient confidence to improve nutrition as well as a modest increase in patient reported exercise level.

All participants in this study did not know the study was about weight and also were asked about other behaviors to distract their attention from weight. In this context, patients' high scores for motivation and confidence may generalize to a broad primary care patient population as opposed to findings from previous studies in which data were collected from participants in weight loss trials. If confirmed, this finding would be important for primary care physicians, who may not assess patients' readiness to lose weight because of incorrect assumptions about their motivation or confidence to do so (19).

Perhaps because of lack of training, physicians rarely used MI or patient-centered techniques in their weight-loss discussions. Training in MI and other forms of patient-centered counseling may help physicians to use these techniques more frequently and consequently increase their confidence in counseling.

Despite the low frequency of empathy expression, there were trends toward improved motivation when it was used. Expression of empathy also was associated with improvement in the Fat and Fiber nutrition score. Finally, expression of empathy was associated with increased odds of attempted weight loss at the three-month follow-up visit, although this effect was not statistically significant. In our experience as well as that of others, expression of empathy has emerged consistently as a useful tool for invoking behavior change (20). This can be as simple as a statement like, “I know losing weight can be frustrating.” Few physicians in this group had a natural inclination toward expression of empathy, and it was seen in only 4% of encounters; however, physicians certainly could learn to incorporate statements of empathy if these are confirmed to be effective.

Use of MI consistent techniques, including affirmation, emphasis of control, providing support, and asking permission, was associated with improvement in confidence to change nutrition, as well as trends toward improved confidence to exercise and lose weight. Use of MI consistent techniques also was associated with improved Framingham exercise scores. This result is somewhat difficult to interpret given the influential outliers; however, these points do represent change in exercise behavior that may have been influenced by use of patient-centered techniques. Similar to expression of Empathy, implementation of MI consistent techniques does not demand implementation of the full MI counseling construct and would not require additional time commitment on the part of providers. A question as simple as, “Do you mind if I give you some suggestions about how to improve what you are eating?” (i.e., asking permission before giving advice) might be enough.

There are three strengths of this study compared with prior work. First, the patient population was a randomly selected group of overweight and obese primary care patients who were not specifically chosen for their interest in weight loss. This is the patient population that providers face each day, yet it is rarely studied. Second, the information about the encounters came from audio recordings rather than patients or providers’ memories of what occurred. Third, the techniques examined here are easy to implement, require no special equipment or tools, and take little time. While formal training is available, less extensive training (21) could help physicians to better express empathy, affirmation, and other patient-centered techniques.

This study also has several limitations. First, physicians often did not use MI techniques, particularly global expression of MI spirit and Empathy; therefore, results for these techniques need to be interpreted cautiously. As expression of Empathy seemed to be one of the most consistently useful techniques in this study, it would be interesting to examine expression of Empathy in the context of a randomized controlled trial to confirm its effect. Second, use of the Fat and Fiber Diet score may have limited our ability to detect healthy changes in diet. The score primarily reflects reductions in dietary fat; it might not reflect a calorie reduction or reduction of dietary carbohydrates, which could also lead to weight reduction. The score was chosen because of its unobtrusive implementation; patients were not aware of the aim of studying weight loss, and it was important not to devote too much emphasis to any portion of the patient survey. The score does not provide perfect information, as no dietary score can do, but it does capture many healthy eating behaviors. Finally, because these are exploratory secondary data analyses involving multiple outcomes, no adjustments for multiple comparisons were made.

4.2 Conclusion

In this community-based sample of primary care patients, more than half of the patients arrived to clinic with high motivation and confidence to lose weight; many of them were actively attempting weight loss at home. Physicians discussed weight-related topics with their patients most of the time, but there was little use of MI consistent and patient-centered

techniques. However, when physicians expressed Empathy and used patient-centered techniques, there was a trend toward improvement in weight-related attitudes and behaviors.

4.3 Practice Implications

Although evidence is limited for the efficacy of short duration and limited frequency physician counseling, data from this study support use and further examination of expression of Empathy and use of MI consistent techniques to improve weight-related attitudes and behaviors. Future study should observe weight-related outcomes with use of these techniques by physicians who receive formal training, in the setting of a randomized trial.

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References

1. Katcher H, Hill A, Lanford J, Yoo J, Kris-Etherton P. Lifestyle approaches and dietary strategies to lower LDL-cholesterol and triglycerides and raise HDL-cholesterol. *Endocrinol Metab Clin N Am*. 2009; 38:45–78.
2. Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*. 2002; 346:393–403. [PubMed: 11832527]
3. Look AHEAD Research Group. Reduction in weight and cardiovascular disease risk factors in individuals with type 2 diabetes. *Diabetes Care*. 2007; 30:1374–83. [PubMed: 17363746]
4. Tsai A, Wadden T. Treatment of Obesity in Primary Care Practice in the United States: A Systematic Review. *J Gen Intern Med*. 2009; 24:1073–9. [PubMed: 19562419]
5. Petrella RJ, Lattanzio CN. Does counseling help patients get active? Systematic review of the literature. *Can Fam Physician*. 2002; 48:72–80. [PubMed: 11852615]
6. Gregg E, Gerzoff R, Thompson T, Williamson D. Intentional weight loss and death in overweight and obese adults 35 years of age and older. *Ann Intern Med*. 2003; 138:383–90. [PubMed: 12614090]
7. National Institutes of Health. The practical guide: identification, evaluation, and treatment of overweight and obesity in adults. Bethesda, MD: North American Association for the Study of Obesity, National Heart, Lung, and Blood Institute; 2000. NIH publication 00-4048. Available at <http://www.nhlbi.nih.gov/guidelines/obesity/practgde.htm>
8. Forman-Hoffman V, Little A, Wahls T. Barriers to obesity management: a pilot study of primary care clinicians. *BMC Fam Pract*. 2006; 7:35. [PubMed: 16756673]
9. Wadden TA, Foster GD. Behavioral treatment of obesity. *Med Clin North Am*. 2000; 84:441–61. [PubMed: 10793651]
10. Brown JB, Stewart M, Ryan BL. Assessing communication between patients and physicians: The Measure of Patient-Centered Communication (MPCC). Center for Studies in Family Medicine. 2001
11. Van Dorsten B. The use of Motivational Interviewing in weight loss. *Cur Diab Rep*. 2007; 7:386–90.
12. Pollak KI, Alexander SC, Coffman CJ, et al. Project CHAT: Physician communication style and weight loss in overweight and obese adults. *Am J Prev Med*. 2010; 39(4):321–328. [PubMed: 20837282]
13. Elfhag K, Rossner S. Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss maintenance and weight regain. *Obes Rev*. 2005; 6:67–85. [PubMed: 15655039]
14. Texeira P, Silva M, Coutinho S, et al. Mediators of Weight Loss and Weight Loss Maintenance in Middle-aged Women. *Obesity*. 2009; 10.1038/oby.2009.281
15. Moyers, T.; Martin, T.; Manuel, J.; Miller, W.; Ernst, D. Revised global scales: The Motivational Interviewing Treatment Integrity Code 3.0. Albuquerque: University of New Mexico; 2007.

16. Shannon J, Kristal A, Curry S, Beresford S. Application of a behavioral approach to measuring dietary change: the fat- and fiber-related diet behavior questionnaire. *Cancer Epidemiol Biomarkers Prev.* 1997; 6:355–61. [PubMed: 9149896]
17. Kristal A, Shattuck A, Henry H. Patterns of dietary behavior associated with selecting diets low in fat: reliability and validity of a behavioral approach to dietary assessment. *J Am Diet Assoc.* 1990; 90:214–20. [PubMed: 2303658]
18. Kannel W, Sorlie P. Some Health Benefits of Physical Activity: The Framingham Study. *Arch Intern Med.* 1979; 139:857–61. [PubMed: 464698]
19. Dolor RJ, Ostbye T, Lyna P, et al. What do physicians and patients think about diet, weight, exercise, and smoking cessation counseling? *Prevent Med.* 2010;10.1016/j.ypmed.2010.07.023
20. Pollak KI, Østbye T, Alexander SC, et al. Empathy goes a long way in weight loss discussions. *J Fam Pract.* 2007; 56(12):1031–6. [PubMed: 18053443]
21. Back AL, Arnold RM, Baile WF, et al. Efficacy of communication skills training for giving bad news and discussing transitions to palliative care. *Arch Intern Med.* 2007; 167:453–60. [PubMed: 17353492]

Table 1

Baseline patient characteristics.

Patient factors (n=461)	M (SD) or %
Race	
White/ Asian	66%
African American	35%
Male	34%
Age	59.8 (13.9)
Education (missing=1)	
High School Education or Less	34%
Post High School Education	67%
Income (missing=37)	
\$45,000 or less	48%
more than \$45,000	52%
Economic security (missing=13)	
Pay Bills no problems	86%
Pay Bills with trouble	14%
BMI	33.1 (7.1)
Obese (BMI >= 30)	54%
Medical history	
Diabetes	31%
Hypertension (missing=1)	69%
Hyperlipidemia (missing=1)	56%
Arthritis	47%
Baseline motivation to improve nutrition ¹	58%
Baseline motivation to improve exercise ¹	67%
Baseline motivation to lose weight ¹	73%
Baseline confidence to improve nutrition ²	54%
Baseline confidence to improve exercise ²	51%
Baseline confidence to lose weight ² (missing=1)	56%
Patient very comfortable discussing weight with physician vs. somewhat to not at all	76%
Baseline Fat and Fiber Nutrition score (scale 1-4)- ³	2.47 (0.46)
Baseline Framingham Physical Activity score (weighted minutes) ⁴	1773 (235)
Patient actively trying to lose weight (pre-visit)	47%
Physician factors (n=40)	
Race	
White/Asian/Pacific Islander	85 %
African American	15%

Patient factors (n=461)	M (SD) or %
Male	40%
Age (missing=1)	47.3 (8.2)
BMI (missing=1)	24.9 (4.0)
Years since medical school graduation	22.1 (8.0)
Specialty	
Family physician	48%
Internist	53%
Confidence to address weight (scale 1-5) ²	4.0 (0.67)
Physician very comfortable discussing weight with patient vs. somewhat to not at all	53%
Physician reports prior training in weight loss counseling	38%
Physician concerned about reimbursement (scale 1-5) ⁵	3.0 (1.57)
Barriers to discussing weight with patients (scale 1-5) ⁶	
Too much time required	2.7 (1.3)
Patient not interested	2.5 (1.2)
Inadequate training	1.9 (0.8)
Other health problems require attention	2.8 (1.2)
Weight loss discussion embarrassing	2.5 (1.1)
Encounter factors (from audio-recordings)	
Total time spent discussing weight (minutes) (missing =15)	3.33 (3.27)
Total patient-medical personnel in room time (minutes) (missing=15)	25.4 (10.3)
Type of encounter	
Preventive	36%
Chronic care	64%
Who initiated the weight loss discussion	
Physician initiated	35%
Patient initiated	55%
Weight not discussed	10%
Explicit weight discussion	64%

¹ Motivation (yes = 5-7, where 1 = Not at all to 7 = Very much)

² Confidence (yes = 4-5, where 1 = Not at all confident to 5 = Very confident)

³ Fat and Fiber score: 1 = low fat, high fiber to 4 = high fat, low fiber

⁴ Framingham Physical Activity score: more intense exercise is more heavily weighted; 1440 minutes (sleeping 24 hours per day) to 7200 minutes (heavy activity 24 hours per day).

⁵ Physician concerns about reimbursement (1 = Not at all concerned to 5 = Very concerned)

⁶ Barriers (1 = Strongly disagree to 5 = Strongly agree)

Table 2

Associations of counseling techniques with post-visit motivation and confidence to change nutrition, exercise and weight loss from logistic regression models adjusted for baseline motivation and/or confidence;

Counseling Technique	Motivation ^a OR [95%CI]; p-value			Confidence ^b OR [95%CI]; p-value		
	Nutrition	Exercise	Weight Loss	Nutrition	Exercise	Weight Loss
MI Spirit	0.8 [0.3, 1.9]; 0.55	1.2 [0.5, 2.5]; 0.70	0.9 [0.4, 2.0]; 0.72	0.6 [0.3, 1.5]; 0.31	0.8 [0.3, 1.8]; 0.53	1.2 [0.5, 2.6]; 0.72
Empathy	2.3 [0.7, 7.5]; 0.17	1.6 [0.6, 4.6]; 0.39	1.4 [0.4, 5.1]; 0.57	1.4 [0.5, 4.1]; 0.53	1.5 [0.5, 4.4]; 0.94	1.0 [0.3, 2.9]; 0.94
MI consistent behavior only^c	1.0 [0.4, 2.6]; 0.96	0.9 [0.4, 2.1]; 0.78	0.8 [0.3, 1.8]; 0.53	2.6 [1.2, 5.7]; 0.02	1.8 [0.8, 4.0]; 0.18	1.9 [0.8, 4.4]; 0.13
Open questions	0.7 [0.4, 1.3]; 0.22	0.8 [0.5, 1.4]; 0.53	1.3 [0.8, 2.4]; 0.34	0.7 [0.4, 1.1]; 0.14	0.8 [0.5, 1.4]; 0.43	1.0 [0.6, 1.7]; 0.95
Reflections	1.1 [0.6, 2.0]; 0.66	1.3 [0.8, 2.2]; 0.33	1.7 [0.9, 3.0]; 0.08	0.8 [0.5, 1.4]; 0.45	0.7 [0.4, 1.3]; 0.27	0.9 [0.5, 1.5]; 0.72

^aMissing 1 baseline and 2 post-visit motivation for diet and exercise

^bMissing 1 baseline confidence for weight 1 baseline confidence for exercise and 1 post-visit

^cMissing 15 codings for MI consistent behaviors

CI, confidence interval; MI, motivational interviewing; OR, odds ratio.

Table 3

Estimated mean differences in 3-month Fat and Fiber score (scale 1 to 4), and Framingham Physical Activity score (Met-minutes between use of counseling technique and no use of counseling technique adjusting for baseline values of outcomes and patient, physician and visit level covariates using ANCOVA models. Estimated odds ratio (OR) of attempted weight loss between use of counseling technique and no use of technique from logistic regression models adjusting for baseline and patient, physician and visit level covariates.

Counseling Technique	Fat and Fiber Scores mean difference[95%CI]; p-value	Framingham Physical Activity score mean difference[95%CI]; p-value	Attempted Weight Loss OR[95%CI]; p-value
MI Spirit^a	0.07 [-0.19, 0.06];0.29	-31 [-102, 40];0.39	2.0[0.7, 5.4];0.20
Empathy^a	-0.18 [-0.36, 0.00];0.05	-23 [-126, 80];0.67	2.9 [0.6, 14.2]; 0.19
Open questions^b	0.04 [-.13, 0.05];0.37	-8 [-53, 36];0.72	1.3 [0.7, 2.5]; 0.53
MI consistent^b	0.04 [-0.18, 0.09];0.52	76 [8, 144];0.03	1.1 [0.3, 2.6];0.86
Reflections^b	0.04 [-0.13, 0.04];0.34	4.1 [-42, 50];0.86	1.1 [0.6, 2.1];0.82

^a(n=461; 69 deleted due to missing covariate data or 3-month data).

^b(n=320; 41 deleted due to missing covariate data or 3-month data).

CI, confidence interval; MET, metabolic equivalent; MI, motivational interviewing; OR, odds ratio.