Weight-Related Perceptions Among Patients and Physicians

How Well do Physicians Judge Patients' Motivation to Lose Weight?

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BACKGROUND: Prior studies suggest that patients and physicians have different perceptions and expectations surrounding weight; however, few studies have directly compared patients' and physicians' perspectives.

OBJECTIVES: (1) To measure the extent to which obese patients and their physicians have discrepant weight-related perceptions, and (2) to explore patient and physician characteristics that may influence patient-physician discrepancy in motivation to lose weight.

DESIGN AND PARTICIPANTS: Four hundred and fifty-six obese patients (302 females; mean age = 55.1 years; mean BMI = 37.9) and their 28 primary care physicians (22 males, mean age = 44.1 years) from nonmetropolitan practices completed an anonymous survey after an office visit.

MEASURES: Weight-related perceptions included perceived weight status, health impact of weight, 1-year weight loss expectations, and motivation to lose weight. Correlates included patient and physician sex, age, and BMI; physicians' reported frequency, perceived patient preference, and confidence for weight counseling; and practice characteristics (e.g., years in practice).

RESULTS: Physicians assigned patients to heavier descriptive weight categories and reported a worse health impact than patients perceived for themselves, whereas patients believed they could lose more weight and reported a higher motivation to lose weight than their physicians perceived for patients ($P < .001$). Physicians who believed patients preferred to discuss weight more often ($P = .001$) and who saw more patients per week ($P = .04$) were less likely to underestimate patient motivation.

CONCLUSIONS: Patients reported more optimistic weight-related perceptions and expectations than their physicians. Further research is needed to determine how these patient-physician discrepancies may influence weight loss counseling in primary care.

KEY WORDS: weight loss goals; patient motivation; patient-physician communication.

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With two-thirds of the U.S. population overweight or obese, prevention and treatment of obesity has become a national health priority.¹ Primary care practices are a critical site for obesity intervention, with physicians uniquely positioned to have a substantial impact on weight loss behavior.^{2,3}

Patients who report receiving physician counseling about weight loss in the past year are up to 2 times more likely to report that they are currently trying to lose weight.^{4,5} However, less than half of obese patients (body mass index [BMI] ≥ 30) report receiving physician advice,^{4,6,7} with those who are in poorer health, more obese, middle-aged, female, and more educated more likely to receive advice.^{4,8,9} Physician counseling about weight loss may be particularly important in nonmetropolitan areas, where residents are more likely to be obese, to exercise less, and to have poorer diets compared with suburban residents.^{10,11}

Primary care physicians report that key barriers to weight loss counseling are self-perceived low competence in treating obesity, lack of treatment effectiveness, and poor patient motivation.¹²⁻¹⁷ Time constraints and inadequate reimbursement may also hinder physician counseling,^{12,18} but these barriers appear to be less crucial than physicians' frustration with treatment ineffectiveness and expectations that patients will be unmotivated and noncompliant with weight loss recommendations.^{13,15,16,19} In a national survey of 620 primary care physicians, over 40% agreed that obese patients could reach a normal weight if they were motivated, but that most patients would not be motivated enough to lose a significant amount of weight.¹² About half of these same physicians felt that they had been unsuccessful in helping their obese patients lose weight, and they believed that the majority of patients were already well aware of their weight-related health risks.

From the perspective of obese patients, physicians often provide less than satisfactory care for weight loss compared with other aspects of health.^{20,21} Many patients report that they want more intensive weight loss treatment than what their physicians provide.²¹ Furthermore, one study suggests that the vast majority of obese women do not look to their physicians for help with weight control.²⁰ Although it is unclear why patients may not seek help for weight loss from their physicians, one barrier may be discrepancies between the patient's and physician's perceptions and expectations related to weight and weight loss. For example, obese patients typically have weight goals that represent a 24% to 38% loss of initial weight²²⁻²⁴ compared with a 14% average weight loss that physicians believe is acceptable¹² and the 10% loss recommended by clinical guidelines.² In addition, many physicians perceive patients to lack motivation,¹²⁻¹⁶ but large

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national surveys indicate that two-thirds of obese patients are actually attempting to lose weight.²⁵

The literature suggests that an individual's self-perceived motivation is critical to the initiation of behavior change²⁶ and that patients are more likely to make health behavior changes when they believe their providers are supportive and encouraging of their motivation and expectations for change.²⁷ These findings have been supported across a number of health behaviors, including smoking cessation,²⁸ adherence to diabetic and other long-term medications,^{29,30} and weight loss.³¹ Thus, a patient's self-perceived motivation and the provider's perception of that motivation are likely key elements influencing patient-provider communication and ultimately the behavior change process that precedes weight loss.

The purpose of the current study was to examine the extent to which patients and physicians have different weight-related perceptions and expectations as an initial step in identifying potential communication barriers between patients and physicians on the topic of weight loss. In addition, we were interested in assessing whether patient, physician, and practice characteristics accounted for physician accuracy in judging patient motivation to lose weight.

METHOD

Study Setting

The study was conducted through the Kansas Physicians Engaged in Prevention Research (KPEPR) practice-based research network composed of 30 family medicine or general internal medicine primary care practices geographically dispersed across all nonmetropolitan (less than 50,000 residents) regions of the state.³² None of the practices specialized in weight management.

Participants

Eligibility criteria for patients were BMI ≥ 30 , at least 18 years of age, English speaking, not pregnant or early postpartum, and not acutely ill, emotionally distressed, or cognitively impaired. For physicians to participate in KPEPR, they had to be in active practice and see patients at least 4 days/week, agree to patient recruitment and study protocols, and be willing to work with a medical student acting as a research assistant within the practice.

Procedure

Trained medical students served as research assistants (RAs) and were on-site at the primary care practices during the 6-week data collection period. The RAs recruited the first obese (BMI ≥ 30 as measured by clinic staff) patient of each morning and afternoon outpatient session, for a maximum of 2 patients per day from each practice. After office visits were completed, RAs asked eligible patients to participate in a brief anonymous survey, described as a survey to improve understanding of how patients and physicians work together to address weight issues. Research assistants emphasized that patients were under no obligation to participate and that their responses would not be shared with their physician or anyone in the medical office and would not affect their health care. RAs then administered a patient-matched survey to the patients' physi-

cian during routine breaks that same day (maximum of 2 surveys per day). All participants provided verbal consent. Although we did not collect information on patients who declined to participate, previous research using the same recruitment methods in the same practices had a 97% response rate.³² This study was approved by the institutional review board at the University of Kansas Medical Center.

Measures

Measures were designed to be completed in a clinical setting in 5 to 10 minutes. Thus, we prioritized keeping the questionnaire short over including several multi-item measures (e.g., on goals and expectations for weight loss).

Patient and Physician Characteristics. Patient demographic and health data included self-reported age, sex, comorbid health conditions, number of weight loss attempts over the past year through diet and exercise, and BMI derived from height and weight measured by clinic staff. Physician characteristics included self-reported age, sex, height, and weight, years in practice, number of patients served in a typical week, and how confident (from 1 = "not at all confident" to 10 = "completely confident") they were in their ability to help patients lose weight. In addition, for each patient in the study, the physician rated how long they had treated the patient, how often they discussed weight with the patient, and how often they believed patient would *prefer* to discuss weight. Response choices for the latter 2 items were 1 = "never or almost never," 2 = "at about one-fourth of our appointments," 3 = "at about one-half of our appointments," 4 = "at about three-fourths of our appointments," and 5 = "always or almost always."

Weight-Related Perceptions and Expectations. Perceived weight status was measured by asking patients/physicians "how would you describe (your/this patient's) weight" on a 6-point scale, from "very underweight" to "very obese." This measure was based on Behavioral Risk Factor Surveillance System Survey (BRFSS) with a sixth descriptor ("very obese") added to avoid a ceiling effect since only obese patients were being surveyed.³³ The health impact of weight was measured by asking "how is (your/this patient's) current weight related to (your/their) health." Response choices were on a 5-point scale from "it almost always has a positive influence on (my/this patient's) health" to "it almost always has a negative influence on (my/this patient's) health." To assess motivation, patients were asked to rate how motivated (1 = "not at all motivated" to 10 = "completely motivated") they were to lose weight in the next 6 months.^{34,35} Physicians were asked the same question of patients, phrased as "how motivated do you think this is patient is to lose weight in the next 6 months?" To assess weight loss expectations, patients/physicians were asked "if you made a realistic long-term plan (for this patient) and (the patient) followed this plan consistently, how many pounds would (you/he or she) have lost by this time next year?" Responses in pounds were transformed to a percent by dividing by the patient's body weight.

Statistical Analyses

Descriptive statistics were calculated for all variables, and paired *t* tests were used to compare mean responses on patients' and physicians' weight-related perceptions. A mixed

model was used to test correlates of patient-physician discrepancy in motivation, calculated as patient's self-reported motivation minus physician's perceived motivation of the patient. Independent variables were patient sex, age, and BMI, physician sex, age, and BMI, and physician-reported frequency and perceived patient preferred frequency in discussing weight, confidence in helping patients lose weight, years treating patient, years in practice, and number of patients per week. In this model, the patients were nested within the physicians, and physician characteristics were modeled as repeated as each physician completed measures for multiple patients. An unstructured covariance matrix was assumed for this clustered analysis. We first tested patient age, sex, and BMI; physician age, sex, and BMI; and the following 3 interaction terms: (1) between patient and physician sex, (2) between patient and physician BMI, and (3) between patient BMI and physician sex (to explore whether male or female physicians rated patient motivation differently based on patient BMI). We then entered the other physician characteristics into a final model. All data analyses were conducted with SAS Version 9.1.

RESULTS

Participants were 456 patients (154 males, 302 females) and their 28 physicians (22 males, 6 females). Physicians completed a mean of 17.0 (SD=9.79) patient-paired surveys. Participant characteristics are shown in Table 1. Patients were 55.1 years old (SD=15.4), had a mean BMI of 37.9 (SD=7.1), and had attempted weight loss in the past year on average 2.7 times by diet and 1.6 times through exercise. Physicians were 44.1 years old (SD=9.6), had a mean BMI of 26.6 (SD=4.5), and had been in practice for an average of 12.8 years (SD=9.2). Physicians reported that they discuss weight with patients at approximately one-half of their appointments but that they would prefer to discuss weight closer to one-fourth

of their appointments. On a scale of 1 to 10, they rated their confidence in helping patients lose weight at 6.4 (SD=2.5).

Table 2 displays the descriptive statistics for patients' weight-related perceptions and their physicians' corresponding ratings. Tests of gender differences among patients showed that female patients reported significantly higher perceived weight status and weight loss expectation ($P<.001$), but male and female patients did not differ in their motivation to lose weight and perceived health impact.

The majority of both patients' and physicians' ratings for perceived weight status were either "a little overweight" or "very overweight or obese," with physicians more likely to rate patients in the heavier category. Similarly, over 95% of physicians' rated the health impact as negative compared with 71.3% of male patients and 79.2% of female patients. Patients' 1-year weight loss expectations were higher than what their physicians thought they could lose, especially for female patients. Likewise, patients' self-reported motivation was significantly higher (mean=6.53, SD=3.09) than what their physicians perceived (mean=4.73, SD=2.45). A motivational level of "10=completely motivated" was reported by 30% of female and 21% of male patients, whereas physicians rated only 2.5% and 3.1% of their female and male patients as being at a "10" (data not shown).

In the model predicting patient-physician discrepancy in motivation, patient age, sex, and BMI, physician age, sex, and BMI, and the hypothesized interaction terms were nonsignificant. However, we retained patient sex and patient BMI to control for their potential influence on other correlates. Table 3 presents the results of the model ($P=.009$). Two physician characteristics were significant: perceived patient preference for discussing weight ($P=.001$) and number of patients seen per week ($P=.04$). To further explore these relationships, we reduced the model using backward elimination (data not shown) and found that perceived patient preference for discussing weight remained highly significant ($P<.001$), whereas number of patients seen per week was marginally significant ($P=.08$). Physicians who believed patients preferred discussing weight more often and who saw more patients per week were more likely to estimate patient motivation accurately.

DISCUSSION

In this sample from nonmetropolitan primary care practices, obese patients and their physicians differed on several weight-related perceptions. Patients were more optimistic about weight loss and health outcomes than their physicians, and they reported at least 3 weight loss attempts in the past year, consistent with BRFSS data that 60% of obese men and 70% of obese women are trying to lose weight.³ Patients expected to lose a lower percentage of body weight than in previous studies, although their expectations, especially among women, were still higher than their physicians'. Whereas the difference in weight loss expectations between male patients and their physicians was clinically small, the difference in perceived weight status was quite large, with 59% of male patients reporting that they were only "a little overweight." Thus, the lower weight loss expectations reported by male patients may be reflective of their inaccurate perception of their weight rather than a more realistic assessment of their ability to lose weight.

Consistent with prior research, physicians in this study also viewed obese patients as having poor motivation for

Table 1. Sample Characteristics

	Mean (SD)*
Patient characteristics (n=456)	
Age	55.1 (15.4)
BMI	37.9 (7.1)
Gender (% male)	33.8
Health comorbidities (%)	
Diabetes	33.1
High blood pressure	63.6
Heart disease	23.3
Depression	32.5
No. past year weight loss attempts	
Through diet	2.7 (5.6)
Through exercise	1.6 (3.2)
Physician characteristics (n=28)	
Age	44.1 (9.6)
BMI	26.6 (4.5)
Gender (% male)	78.6
Years in practice	12.8 (9.2)
No. of patients per week	100.3 (35.7)
Years treating patient	6.4 (6.9)
Discuss weight with patient, frequency	2.8 (1.4)
Perceived pt preference to discuss weight	2.26 (1.1)
Confidence in helping patients lose weight†	6.4 (2.5)

*Unless noted as %.

†Higher scores reflect higher confidence ratings.

BMI, body mass index.

Table 2. Descriptive Statistics of Patient's Self-Perceptions and Physician's Perceptions of Patient

	Female Patients (n=302)		Male Patients (n=154)		All Patients (n=456)	
	Patient Self-Report	Physician Report of Patient	Patient Self-Report	Physician Report of Patient	Patient Self-Report	Physician Report of Patient
Perceived weight status (Mean [SD])	4.84 (0.60)	4.96 (0.68)	4.42 (0.64)	4.82 (0.64)	4.70 (0.65)	4.91 (0.67)
"just right" to "underweight" (%)	0.9	0.9	2.5	0.6	1.4	0.8
"a little overweight" (%)	27.6	25.8	59.4	32.5	38.4	28.0
"very overweight or obese" (%)	61.6	52.9	32.5	53.8	51.8	53.3
"very obese" (%)	9.8	20.4	5.6	13.1	8.4	17.9
Impact of weight on health (Mean [SD])	4.04 (0.89)	4.46 (0.64)	3.88 (0.92)	4.47 (0.63)	3.98 (0.91)	4.46 (0.64)
"positive impact" (%)	7.7	0.6	8.1	1.3	7.8	0.9
"no impact" (%)	13.1	4.1	20.6	2.5	15.5	3.3
"negative impact" (%)	79.2	95.3	71.3	96.2	76.7	95.8
1-y weight loss expectation (% wt)	18.8 (10.39)	12.33 (6.25)	12.94 (7.68)	11.56 (4.92)	16.8 (9.93)	12.0 (5.85)
Motivation to lose weight (Mean [SD])	6.73 (3.04)	4.78 (2.44)	6.19 (3.14)	4.64 (2.47)	6.56 (3.09)	4.73 (2.45)

All mean differences between patients and physicians are significant at $P < .001$, except for perceived weight status among female patients, which is significant at $P = .04$. Mean differences between female patients and male patients are significant for perceived weight status and 1-year weight loss expectation only ($P < .001$).

Higher ratings indicate (1) heavier perceived weight status on a 6-point scale, (2) more negative perception of health impact on a 5-point scale, (3) higher weight loss expectation, and (4) higher motivation to lose weight on a 10-point scale as reported by patient and judged by physician.

weight loss. However, our results provide evidence that this perception may be misguided. Although it is possible that patients' responses were biased by social desirability, self-assessed motivation is not only widely used but is related to the initiation of behavior change.²⁶ Further research is needed to evaluate the basis of this discordant perception of motivation and the extent to which it impacts the frequency and quality of physician counseling.

Physicians who believed patients preferred talking about weight more accurately judged their patients' motivation. In addition, physicians who perceived an obese patient to be unmotivated were more likely to perceive the patient did not want to talk about weight, however their report of how often they *actually* talked about weight loss was not affected by their perception of patient motivation. Across all patients, physicians reported that they talk about weight loss *more* often than they believe their patients prefer. These findings suggest that physicians who perceive a patient to be unmotivated and to prefer not to discuss weight may still provide weight loss counseling in accordance with clinical guidelines. However, their

perception of low patient motivation may be qualitatively evident in communication patterns, e.g., they may not emphasize the importance of weight loss or provide fewer positive expectations with the patients they perceive to lack motivation.

In turn, patients with high motivation and expectations for weight loss may be disappointed by comments from a physician who has a less optimistic and/or more realistic perspective. To the extent that differences in perceptions and expectations hinder positive communication, including both verbal and nonverbal exchanges, both parties may be reluctant to discuss the subject. This may be one explanation for why many physicians do not routinely counsel patients on weight loss,^{4,6,7} why many obese patients may not expect help from their physicians for weight control,^{4,6,7,20} or why, as one recent qualitative study reported, the subject of weight loss is rarely approached in primary care outside of casual opportunities to link it to an existing health condition.³⁶

Further, it is possible that physicians in this study did not distinguish between patient's motivation (desire and purpose), intention (plan and course of action), and effectiveness (chance of success) at losing weight. There is also a distinction between motivation and expected outcomes as a patient may be highly motivated to lose weight but may have unrealistic expectations for the amount of weight loss. Patients who are highly motivated but who lack intention, skills, or realistic weight loss expectations may benefit most from physician guidance on setting appropriate goals and implementing an empirically based course of action for weight loss. Specifically, physician training in counseling techniques such as motivational interviewing may facilitate patient-physician communication on weight loss.²⁶ Motivational interviewing is a communication style emphasizing reflective listening and directive questioning whereby the provider refrains from drawing conclusions but rather first assesses patient motivation and expectations in a collaborative manner that both validates and provides guidance that the patient may be more likely to accept and act upon. These strategies can be effective even as brief interventions delivered by physicians in a primary care setting³⁵

Table 3. Model Predicting Patient-Physician Discrepancy in Perceived Motivation to Lose Weight*

Independent Variable	Standardized Estimate	P-Value
Patient BMI	0.07	.16
Patient sex	−0.04	.37
Years in practice	0.05	.43
No. of patients per week	−0.11	.04
Years treating patient	0.01	.93
Discuss weight with patient, frequency	0.05	.48
Discuss weight with patient, preferred frequency	−0.20	.001
Confidence in helping patients lose weight	0.03	.53

*Dependent variable = patient-reported motivation minus physician-reported motivation.

BMI, body mass index.

and may also improve physicians' confidence in their ability to positively impact patients' weight loss behaviors.

Limitations of the current study include the cross-sectional design using a brief survey with a convenience sample of an ethnically homogeneous population. In addition, recall bias or social desirability may have influenced survey responses; however, the use of a paired, anonymous survey at the point of care was intended to minimize these biases. Although the act of completing a survey may have subsequently prompted physicians to discuss weight loss with other patients, in several prior studies of physician behavior in our practice-based network, we observed no appreciable change in counseling over a 6-week-period on topics such as smoking, cancer screening, and exercise, suggesting that research activities within a busy medical practice influence physician behavior very little over the course of a brief study.^{37,38} This study extends the research on perceptions about weight in primary care by including nonmetropolitan practices and by surveying both patients and physicians in order to assess directly for patient-physician discrepancies. Future work is needed to expand the findings to a larger and more diverse population and to describe and verify counseling behavior through direct observation.

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REFERENCES

- Strategic Plan for NIH Obesity Research: A Report of the NIH Obesity Research Task Force. In: Services USDoHaH, editor; 2004.
- Clinical guidelines on the identification, evaluation and treatment of overweight and obesity in adults: executive summary. Expert panel on the identification, evaluation, and treatment of overweight in adults. *Am J Clin Nutr*. 1998;68:899-917.
- Serdula MK, Khan LE, Dietz WH. Weight loss counseling revisited. *JAMA*. 2003;289:1747-50.
- Galuska DA, Will JC, Serdula MK, Ford ES. Are health care professionals advising obese patients to lose weight? *JAMA*. 1999;282:1576-8.
- Sciamanna CN, Tate DF, Lang W, Wing RR. Who reports receiving advice to lose weight? Results from a multistate survey. *Arch Intern Med*. 2000;160:2334-9.
- Stafford RS, Farhat JH, Misra B, Schoenfeld DA. National patterns of physician activities related to obesity management. *Arch Fam Med*. 2000;9:631-8.
- Anis NA, Lee RE, Ellerbeck EF, Nazir N, Greiner KA, Ahluwalia JS. Direct observation of physician counseling on dietary habits and exercise: patient, physician, and office correlates. *Prev Med*. 2004;38:198-202.
- Honda K. Factors underlying variation in receipt of physician advice on diet and exercise: applications of the behavioral model of health care utilization. *Am J Health Promot*. 2004;18:370-7.
- Wee CC, McCarthy EP, Davis RB, Phillips RS. Physician counseling about exercise. *JAMA*. 1999;282:1583-8.
- Eberhardt MS, Pamuk ER. The importance of place of residence: examining health in rural and nonrural areas. *Am J Public Health*. 2004;94:1682-6.
- Patterson PD, Moore CG, Probst JC, Shinogle JA. Obesity and physical inactivity in rural America. *J Rural Health*. 2004;20:151-9.
- Foster GD, Wadden TA, Makris AP, et al. Primary care physicians' attitudes about obesity and its treatment. *Obes Res*. 2003;11:1168-77.
- Mercer S, Tessier S. A qualitative study of general practitioners' and practice nurses' attitudes to obesity management in primary care. *Health Bull*. 2001;59:248-53.
- Kottke TE, Foels JK, Hill C, Choi T, Fenderson DA. Nutrition counseling in private practice: attitudes and activities of family physicians. *Prev Med*. 1984;13:219-25.
- Kolagotla L, Adams W. Ambulatory management of childhood obesity. *Obes Res*. 2004;12:275-83.
- Story MT, Neumark-Stzainer DR, Sherwood NE, et al. Management of child and adolescent obesity: attitudes, barriers, skills, and training needs among health care professionals. *Pediatrics*. 2002;110(Part 2):210-4.
- Jelalian E, Boergers J, Alday CS, Frank R. Survey of physician attitudes and practices related to pediatric obesity. *Clin Pediatr (Philadelphia)*. 2003;42:235-45.
- Pratt C, Nosiri U, Pratt C. Michigan physicians' perceptions of their role in managing obesity. *Perceptual Motor Skills*. 1997;84:848-50.
- Truswell AS, Hiddink GJ, Hautvast JG. Family doctors and patients: is effective nutrition interaction possible? *Eur J Clin Nutr*. 1999;53(suppl 2):S1-2.
- Wadden TA, Anderson DA, Foster GD, Bennett A, Steinberg C, Sarwer DB. Obese women's perceptions of their physicians' weight management attitudes and practices. *Arch Fam Med*. 2000;9:854-60.
- Potter MB, Vu JD, Croughan-Minihane M. Weight management: what patients want from their primary care physicians. *J Fam Pract*. 2001;50:513-8.
- Foster GD, Phelan S, Wadden TA, Gill D, Ermold J, Didie E. Promoting more modest weight losses: a pilot study. *Obes Res*. 2004;12:1271-7.
- Foster GD, Wadden TA, Phelan S, Sarwer DB, Sanderson RS. Obese patients' perceptions of treatment outcomes and the factors that influence them. *Arch Intern Med*. 2001;161:2133-9.
- Foster GD, Wadden TA, Vogt RA, Brewer G. What is a reasonable weight loss? Patients' expectations and evaluations of obesity treatment outcomes. *J Consult Clin Psychol*. 1997;65:79-85.
- Serdula MK, Mokdad AH, Williamson DF, Galuska DA, Mendlein JM, Heath GW. Prevalence of attempting weight loss and strategies for controlling weight. *JAMA*. 1999;282:1353-8.
- Miller WR, Rollnick S. *Motivational Interviewing: Preparing People for Change*. 2nd Ed. New York: Guilford Press; 2002.
- Deci EL, Ryan RM. *Intrinsic Motivation and Self-determination in Human Behavior*. New York: Plenum; 1985.
- Kolotkin RL, Crosby RD, Williams GR. Health-related quality of life varies among obese subgroups. *Obes Res*. 2002;10:748-56.
- Resnicow K, Kramish Campbell M, Carr C, et al. Body and soul: a dietary intervention conducted through African-American churches. *Am J Prev Med*. 2004;27:97-105.
- Williams GC, Rodin GC, Ryan RM, Grolnick WS, Deci EL. Autonomous regulation and long-term medication adherence in adult outpatients. *Health Psychol*. 1998;17:269-76.
- Carter-Nolan PL, Adams-Campbell LL, Williams J. Recruitment strategies for black women at risk for noninsulin-dependent diabetes mellitus into exercise protocols: a qualitative assessment. *J Natl Med Assoc*. 1996;88:558-62.
- Greiner KA, Engelman KK, Hall MA, Ellerbeck EF. Barriers to colorectal cancer screening in rural primary care. *Prev Med*. 2004;38:269-75.
- Behavioral Risk Factor Surveillance System: Centers for Disease Control and Prevention; 1999.
- Resnicow K, Jackson A, Wang T, et al. A motivational interviewing intervention to increase fruit and vegetable intake through Black churches: results of the eat for life trial. *Am J Public Health*. 2001;91:1686-93.
- Rollnick S, Butler CC, Stott N. Helping smokers make decisions: the enhancement of brief intervention for general medical practice. *Patient Educ Couns*. 1997;31:191-203.
- Arab L, Carriquiry A, Steck-Scott S, Gaudet MM. Ethnic differences in the nutrient intake adequacy of premenopausal US women: results from the Third National Health Examination Survey. *J Am Diet Assoc*. 2003;103:1008-14.
- Ellerbeck EF, Ahluwalia JS, Jolicoeur DG, Gladden J, Mosier MC. Direct observation of smoking cessation activities in primary care practice. *J Fam Pract*. 2001;50:688-93.
- Ellerbeck EF, Choi WS, McCarter K, Jolicoeur DG, Greiner A, Ahluwalia JS. Impact of patient characteristics on physician's smoking cessation strategies. *Prev Med*. 2003;36:464-70.