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Physician Practice Patterns of Obesity Diagnosis and Weight-Related Counseling

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Abstract

Objective—To examine national physician practice patterns of obesity care and the predictors of these practices.

Methods—We analyzed cross-sectional clinical encounter data. Obese adults were obtained from the 2005 National Ambulatory Medical Care Survey (N=2458).

Results—A third of obese adults received an obesity diagnosis (28.9%) and approximately a fifth received counseling for weight reduction (17.6%), diet (25.2%), or exercise (20.5%). Women (OR = 1.54; 95%CI: 1.14, 2.09), young adults ages 18 to 29 (OR = 2.61; 95%CI: 1.37, 4.97), and severely/morbidly obese individuals (class II: OR 2.08; 95%CI: 1.53, 2.83; class III: OR 4.36; 95% CI: 3.09, 6.16) were significantly more likely to receive an obesity diagnosis. One of the biggest predictors of weight-related counseling was an obesity diagnosis (weight reduction: OR = 5.72; 95%CI: 4.01, 8.17; diet: OR = 2.89; 95%CI: 2.05, 4.06; exercise: OR = 2.54; 95%CI: 1.67, 3.85). Other predictors of weight-related counseling included seeing a cardiologist/other internal medicine specialist, a preventive visit, or spending more time with the doctor ($p < 0.05$).

Conclusions—Most obese patients do not receive an obesity diagnosis or weight-related counseling.

Practice Implications—Preventive visits may provide a key opportunity for obese patients to receive weight-related counseling from their physician.

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Keywords

obesity; physician practice patterns; weight-related counseling; diagnosis

BACKGROUND

Clinical guidelines for obesity call for assessment (e.g., diagnosis) and management (e.g., dietary and exercise therapy) [1]. In addition, the U.S. Preventive Task Force recommends that clinicians screen all patients for obesity and offer intensive counseling and behavioral interventions to promote sustained weight loss [2]. Despite these guidelines, physician obesity care is sub-optimal and varies by patient characteristics [3-10]. There is also evidence pointing to low rates of physician screening and advice for behavioral health risk factors related to obesity (e.g., physical inactivity) [11-12].

Low rates of obesity diagnosis and management as well as differential treatment by patient characteristics is concerning. There is a growing body of evidence suggesting that patients who are told by their physician that they are overweight are more likely to lose weight relative to those who are not told [13-14], that patients who are counseled about their weight or weight-related behaviors are more likely to report working on those areas [3,7,15], and that patients who are advised by their physician to modify their behavior are generally more confident and motivated to engage in lifestyle modifications (e.g., dietary changes, increased physical activity) [3,16-17].

The primary purpose of this paper was to examine whether obese patients receive an obesity diagnosis and weight-related counseling from their physician. We additionally identified the sociodemographic, physician, and clinical encounter characteristics associated with receipt of obesity diagnosis and weight-related counseling. In light of the current federal priorities to reduce obesity and eliminate health disparities, identified in the U.S. Department of Health and Human Services' Healthy People 2000 and Healthy People 2010 initiatives [18-20], there is a need to better understand variations in physician delivery of obesity care and the predictors of these patterns.

RESEARCH DESIGN AND METHODS

Design

The study was a retrospective assessment of cross-sectional clinical encounter data from physician office visits.

Data

The data for this study was obtained from the 2005 National Ambulatory Medical Care Survey (NAMCS) – a national annual survey of patient visits reported by physicians [21]. Participating physicians were randomly selected from the master files of the American Medical Association and the American Osteopathic Association by geographical area and specialty. Only patient visits to the offices of non-federally employed physicians, with visits classified by the American Osteopathic Association and the American Medical Association as office-based, patient care, were included in the 2005 NAMCS. Of selected physicians, the response rate was 61.5%. For each participating physician, one week of the year was randomly selected for systematic sampling of 20% to 100% of patient visits. For each selected patient visit, physicians completed an encounter form which detailed the specific clinical services provided during the visit, patient demographics, International Classification of Diseases, Ninth Revision (ICD-9) diagnostic codes, reason for visit, physician

characteristics, visit characteristics, new or continued medications, diagnostic tests and types of counseling provided.

The 2005 NAMCS is the first time actual height and weight measurements were included in the survey instrument. A third of the sample had both height and body weight measurements which allowed BMI to be determined. Measures of patient height and body weight were obtained at the time of the sampled patient visit and recorded by the physician in the clinical encounter form. If patient height and weight were not measured at the visit, the provider reviewed the patient chart for the last time height and weight were recorded [21]. For this study, individuals were considered obese if their body mass index (BMI) ≥ 30 kg/m². The sample size for the analysis included 2,458 obese individuals (ages 18 and older).

Measures

Outcome Variables—Four outcome measures were explored in this analysis. One identified obese patients who received an obesity diagnosis and three examined obese patients who received weight-related counseling (weight reduction, diet or exercise). Individuals were considered to have an obesity diagnosis or to have received diet, exercise, or weight reduction counseling if indicated via check box on the NAMCS encounter form (by the physician). Weight-related counseling did not include receipt of medications or surgeries. Each outcome variable was examined as a separate, dichotomous outcome variable (e.g., 1 = received diet counseling, 0 = did not receive diet counseling).

Independent Variables—The independent variables included: patient sociodemographic characteristics (race/ethnicity, gender, age, region, and health insurance), patient risk (co-morbidity risk status and obesity class), physician characteristics (specialty) and characteristics of the clinical encounter (visit type, seen before by practice and time spent with doctor). The obesity classes included: class I = BMI ≥ 30 & < 35 ; class II = BMI ≥ 35 & < 40 or class III = BMI ≥ 40 . Insurance was defined as private or non-private (Medicare, Medicaid, worker's compensation, self-pay, charity, other). Physicians were categorized into five different specialties: primary care (general internal medicine, general/family practice, pediatrics); cardiology and other internal medicine specialties; obstetrics/gynecology (hereafter referred to as OB/GYN); surgical care specialties and other medical care specialties. We included cardiologists/other internal medicine sub-specialties as a separate category from general internal medicine given evidence suggesting that attitudes towards involvement in obesity management differed significantly between these groups [22]. The type of clinical visit was defined as preventive (e.g., routine or general exam), ongoing chronic problem or acute problem.

Risk Status—We categorized patients according to their overall co-morbidity risk status using the clinical guidelines for the identification, evaluation and treatment of obesity in adults [23]. International Classification of Diseases, Ninth Revision (ICD-9) diagnostic codes were used to identify patient co-morbidities. Patient were classified as having a very high co-morbidity risk if they had ischemic heart disease (410-414), diabetes (250), sleep apnea (780.57) or other atherosclerotic diseases (peripheral arterial disease, 443.9; abdominal aortic aneurysm, 441; symptomatic carotid artery disease, 433.1); high risk if they had any one of the following: osteoarthritis (715), gallstones (574), stress incontinence (female 625.6; male 788.32), hyperlipidemia (272), hypertension (401-405), smoked cigarettes or were men aged 45 and older, or women aged 55 years or older; and lower risk if they were obese but had no other obesity-related risk factors. Ideally, we would have included other measures in our risk status variable, such as physical inactivity, but those data were not available in the 2005 NAMCS.

Statistical Analyses

Multivariate logistic regression with binary outcomes was used to model the outcome variables of interest. All identified variables were included in the models based on the literature regardless of statistical significance. For all analyses, we used the patient visit survey weight (PATWT) provided in the NAMCS dataset to adjust the sample of visits to represent the total national population of ambulatory visits in the survey year. We also adjusted all analyses to account for the clustering of patients among physicians. Patient data was moderately clustered by provider (ICC = 0.29); the 2,458 patients included in the analysis were clustered among 439 physicians. Statistical analyses were performed using the STATA, version 9.2 software package (StataCorp LP, College Station, TX).

RESULTS

Characteristics of the sample

Table 1 reports the characteristics of the study sample. Three-fourths of the study sample was White (75.3%), more than half were female (57.6%), two-thirds were age 45 and older (68.4%) and more than half had private insurance (57.0%). The majority of patients had a high or very high co-morbidity risk status (59.7%) and about half were class I obese (54.3%). About half of the patient visits were characterized as preventive or chronic (preventive, 14.8%; chronic 36.6%) and most patients had been seen before by someone in the practice (86.7%). Physicians in the sample represented the following specialties: primary care (62.6%), surgical care (14.4%), cardiology and other internal medicine specialists (10.4%), OB/GYN (5.2%) and other (7.3%). Primary care specialists included general internal medicine, general/family practice and pediatrics.

Characteristics of the outcome variables

Frequencies for the outcome variables of interest are also presented in Table 1. A third of our study sample (28.9%) received an obesity diagnosis, approximately a fifth received weight reduction counseling (17.6%) or exercise counseling (20.5%), and a quarter received diet counseling (25.2%).

Obesity prevalence and obesity diagnosis

Figure 1 illustrates rates of obesity prevalence in the 2005 NAMCS sample and the fraction of obese patients that received an obesity diagnosis from their physician. For both sexes, all race/ethnicity groups, age groups and each region of the country, rates of obesity diagnosis were considerably lower than the prevalence of obesity. In addition, rates of obesity diagnosis differed by patient characteristics. For example, the rate of obesity was higher among men as compared to women (38.7% vs. 34.9%). Yet, our observed rate of obesity diagnosis was higher among women (9.0% vs. 11.5%).

Predictors of an obesity diagnosis among obese adults

Table 2 (column 1) shows the adjusted predictors of an obesity diagnosis among obese adults. Patients who were female (OR = 1.54; 95% CI: 1.14, 2.09), younger (age 18-29: OR = 2.61; 95% CI: 1.37, 4.97), with class II or class III obesity (class II: OR = 2.08; 95% CI: 1.53, 2.83; class III: OR = 4.36; 95% CI: 3.09, 6.16), living in the Midwest (OR = 1.78; 95% CI: 1.08, 2.93) or being seen by a cardiologist or other internal medicine specialist (OR = 2.22; 95% CI: 1.09, 4.56) had a greater likelihood of receiving an obesity diagnosis than their respective counterparts. We did not observe a relationship between patient race and receipt of an obesity diagnosis.

Predictors of weight-related counseling among obese adults

The frequency of weight related counseling differed significantly between obese adults with an obesity diagnosis and obese adults without an obesity diagnosis (weight reduction: 37.1% vs. 9.6%; diet: 42.6% vs. 18.1%; and exercise: 33.3% vs. 15.3%; $p < 0.000$). It also differed significantly by risk status; obese patients at very high risk were significantly more likely to receive weight related counseling as compared to obese patient at lower risk status (weight reduction: 25.7% vs. 12.9%; diet: 38.0% vs. 18.6%; and exercise: 29.0% vs. 14.0% $p < 0.05$). Table 2 also examines the predictors of each type of weight-related counseling among obese adults: weight reduction (second column), diet (third column) and exercise (fourth column).

One of the largest predictors of each type of weight-related counseling was receipt of an obesity diagnosis (weight-reduction: OR = 5.72; 95% CI: 4.01, 8.17; diet: OR = 2.89; 95% CI: 2.05, 4.06; exercise: OR = 2.54; 95% CI: 1.67, 3.85). With respect to patient demographic characteristics, we observed significant relationships between weight reduction counseling and patient age (age 30-44: OR = 2.19; 95% CI: 1.08, 4.41) as well as all three types of weight-related counseling and living in the Northeast (weight-reduction: OR = 2.81; 95% CI: 1.38, 5.74; diet: OR = 2.13; 95% CI: 1.17, 3.91; exercise: OR = 2.03; 95% CI: 1.04, 3.97). A higher comorbidity risk was also associated with each type of weight-related counseling (weight-reduction – very high: OR = 2.91; 95% CI: 1.43, 5.92, high: OR = 2.26; 95% CI: 1.36, 3.77; diet – very high: OR = 2.84; 95% CI: 1.59, 5.06, high: OR = 1.98; 95% CI: 1.28, 3.06; exercise – high: OR = 1.94; 95% CI: 1.21, 3.09). For both weight-reduction and diet counseling, patients who saw a cardiologist or other internal medicine specialist were significantly more likely to receive counseling (weight-reduction: OR = 4.01; 95% CI: 1.49, 10.74; diet: OR = 4.17; 95% CI: 1.57, 11.08). A preventive visit was also significantly associated with each type of counseling (weight reduction: OR = 1.79; 95% CI: 1.12, 2.85; diet OR = 1.61; 95% CI: 1.09, 2.39; exercise: OR = 2.00; 95% CI: 1.27, 3.15). A chronic, ongoing visit was significantly associated with patient receipt of exercise counseling (OR = 1.58; 95% CI: 1.06, 2.35). Patients who spent more time with the doctor were significantly more likely to receive each type of counseling (weight reduction – more than 24 minutes: OR = 2.92; 95% CI: 1.40, 6.09; diet – more than 24 minutes: OR = 2.84; 95% CI: 1.62, 4.96, 13-24 minutes: OR = 1.76; 95% CI: 1.02, 3.04; exercise – more than 24 minutes: OR = 3.68; 95% CI: 1.99, 6.82, 13-24 minutes: OR = 2.14; 95% CI: 1.16, 3.95).

DISCUSSION

This paper examined whether obese patients receive an obesity diagnosis and weight-related counseling from their physician. Our secondary aim was to identify sociodemographic characteristics, physician characteristics, or characteristics of the clinical encounter associated with obesity diagnosis and weight-related counseling.

Our findings indicate that rates of obesity diagnosis and weight-related counseling were low in 2005, despite clinical guidelines suggesting that clinicians screen all adult patients for obesity and offer intensive counseling to promote sustained weight loss for obese adults [2]. We also found that receipt of an obesity diagnosis was one of the largest predictors of weight-related counseling. For our model looking at predictors of an obesity diagnosis, our results suggest that female gender, young age, living in the Midwest, class II or class III obesity, and being seen by a cardiologist or other internal medicine specialties were positively and significantly associated with receipt of an obesity diagnosis. For our models looking at the predictors of weight-related counseling, receipt of an obesity diagnosis was the largest predictor in the weight reduction model and one of the largest in the diet and exercise counseling models. Consistent across all three counseling models was the significant relationship between receipt of weight-related counseling and the following

covariates: high co-morbidity risk status, preventive visit (as compared to an acute visit), time spent with the doctor, and geography (obese patients living in the Northeast as compared to the South).

There are both similarities and differences between these findings and previous research. Like earlier studies, we observed a low rate of obesity diagnosis among obese individuals (28.9%) [6,8,24]. Also similar to prior research, we found a higher likelihood of obesity diagnosis among women as compared to men [25], among younger age individuals as compared to older individuals [24], and among individuals with higher co-morbidity risk as compared to individuals with lower co-morbidity risk [8,24]. Our findings related to the predictors of weight-related counseling also align well with previous work. We found that a high co-morbidity risk status [26], living in the Northeast region of the country [8], and having an obesity diagnosis [24] were positively associated with weight-related counseling. Similar to research using the NAMCS data from a prior year (1995) [8], we did observe an association between cardiologists/other internal medicine specialties and obesity diagnosis/weight-reduction counseling. In contrast to national estimates [27], higher rates of obesity were observed in men rather than women. Unlike previous studies [5], we did not observe a relationship between race/ethnicity and receipt of weight-related counseling. This suggests that minority patients, who are disproportionately impacted by obesity, are not more likely than Whites to be identified as obese or receive weight-reduction counseling. Our lack of a race effect suggests that physicians may lack sensitivity to underlying levels of obesity risk in the adult population given that the sub-groups who are at higher obesity risk are not more likely to receive obesity care. While lower-risk groups will likely benefit from receiving an obesity diagnosis or weight-related counseling, physician practices related to obesity care may be more effective if they focus more on sub-populations at higher risk for obesity.

This paper contributes to the literature by updating prior (nationally representative) estimates with data including *measured* height and body weight, allowing for a more precise estimation of the obese population. We additionally identify the sociodemographic, physician, and clinical encounter characteristics associated with receipt of obesity diagnosis and weight-related counseling.

Future Research

The results from this study suggest the need for more research. In all models included in these analyses, the variance explained was below twenty percent. This suggests that there are factors, other than those we measured in this paper, which are also associated with our outcome variables of interest. Previous research suggests that low rates of physician diagnosis and weight-related counseling may also be related to inadequate training [16,28-31], the belief that advice would have little effect on patient behavior [30,32], the belief that patients are not interested or ready for treatment [28,30,33-34], negative attitudes towards obese patients [35-37], the belief that obesity is the responsibility of the patient [38], or the belief that obesity is hard to handle [39]. Health system barriers to effective obesity care, which have been previously identified, include lack of: payment by insurance companies for weight-related counseling and care [30,40-41], available teaching materials for patients [28,30], infrastructure support/places to refer patients [42], a reminder system [43], or sufficient staff or consultant support [43]. To what extent these physician attitudes and health system factors are associated with physician practice patterns of obesity care is unknown.

Another important area of future research is the variation in the frequency and predictors of the three weight-related counseling activities explored in this analysis. Our results suggested that physicians were more comfortable providing diet counseling (as compared to weight-reduction or exercise counseling), and that the magnitude of the effect of an obesity

diagnosis on receipt of weight-related counseling was not consistent across the three counseling strategies. A better understanding of these relationships may help facilitate more effective delivery of obesity-related services.

The Dartmouth Atlas Project, which has documented considerable variation in the delivery of healthcare by geographic variation, also serves as a useful guide for continued research in this area [44-45]. The Atlas Project has shown, for example, that the most significant factor associated with Medicare spending in a given region is the availability of medical resources. Therefore, future research should consider the availability of supply-side factors when estimating variations of obesity care, particularly among smaller geographic units (e.g., counties, zip codes). Future research should also examine why certain physician specialties (i.e. cardiology and other internal medicine specialties) are more likely to provide obesity care as well as whether additional physician characteristics, such as knowledge or body weight, influence physician practice patterns of obesity diagnosis and weight-related counseling.

Limitations

There are several limitations to this analysis worth noting. First, this analysis is cross-sectional which limits our ability to make causal inferences. Second, the data rely on physician reports (which cannot be objectively verified), and which may lead to an underestimation of weight-related counseling given evidence suggesting that physicians under report behavioral counseling [46]. However, recent research validating the NAMCS indicates that it is highly specific, suggesting that if physicians report having delivered a service, there is a high likelihood that it was given [47]. Third, patient race/ethnicity is based on physician report. A physician's perception of a patient's race/ethnicity may differ from the patient's own perception; however, it is likely that physicians' perceptions of patients' race/ethnicity influence their own communication behaviors and decision-making. Fourth, because the NAMCS is a visit-based survey, obese patients who see their physician more often may have received an obesity diagnosis or weight-reduction counseling at a clinical encounter not captured by the survey. To account for this limitation, we do control for whether the patient was seen previously by a health professional in the practice. Fifth, patients were considered to have received weight-related counseling if it was "ordered or provided" at the clinical encounter. In the case of ordered services, it was not possible to know whether the patient actually received them. It is also not possible to know the quality of counseling services provided or ordered. Sixth, we are unable to determine from the data whether patients had health insurance coverage for weight-reduction counseling. However, we controlled for respondents' health insurance status as a crude proxy for access to obesity-related services. Seventh, missing height and body weight information likely excludes some obese patients. Finally, physicians may be more likely to provide weight-related counseling to morbidly obese patients (as compared to obese patients) since they are at higher risk for metabolic abnormalities and other adverse health conditions. To account for this possible limitation, we controlled for obesity class in the models.

Practice Implications

Physicians and other health professionals are uniquely positioned to impact obesity care; in 2005 an estimated 963.6 million visits were made to doctors' offices [48]. Given the penetration of the obesity epidemic, even modest reductions in body weight at the individual-level can lead to significant health benefits and reduced costs at the population-level [49-50]. Efforts to improve the care of obese patients in clinical practice will need to consider barriers which may undermine obesity care previously identified in the literature [16,28-30,33-34,40,42-43,51]. The results from this analysis suggest that preventive visits

may provide a key opportunity for obese patients to receive weight-related counseling from their physician.

There is a need for better systems to appropriately diagnose obese patients, particularly those at highest risk, and subsequently provide necessary weight-related counseling to help patients lose or maintain their weight. One possible system that could facilitate improvement of obesity care is the chronic care model which supports delivery of effective and efficient clinical care and self-management support, data systems that monitor the performance of the care system and provide reminders for both providers and patients, and decision support that is consistent with scientific evidence and patient preferences, among other objectives [52].

CONCLUSION

In summary, our findings suggest considerable missed opportunities in the diagnosis and management of adult obesity. Moreover, most obese patients with a higher underlying risk of excess weight (e.g., racial/ethnic minorities) do not have a higher likelihood of receiving obesity care after controlling for demographic characteristics, risk status, physician characteristics and characteristics of the clinical encounter.

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REFERENCES

1. North American Association for the Study of Obesity (NAASO); the National Heart Lung and Blood Institute. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults -- The Evidence Report. National Institutes of Health. Obesity Research 1998;6(Suppl 2):51S–209S. [PubMed: 9813653]
2. US Preventive Services Task Force. Screening for obesity in adults: recommendations and rationale. *Annals of Internal Medicine* 2003;139(11):930–2. [PubMed: 14644896]
3. Galuska DA, et al. Are health care professionals advising obese patients to lose weight? *Journal of the American Medical Association* 1999;282(16):1576–8. [PubMed: 10546698]
4. Jackson JE, et al. Trends in professional advice to lose weight among obese adults, 1994 to 2000. *Journal of General Internal Medicine* 2005;20(9):814–8. [PubMed: 16117748]
5. Ma J, et al. Diet and physical activity counseling during ambulatory care visits in the United States. *Preventive Medicine* 2004;39(4):815–22. [PubMed: 15351551]
6. Ma J, Xiao L, Stafford RS. Underdiagnosis of obesity in adults in US outpatient settings. *Archives of Internal Medicine* 2009;169(3):313–4. [PubMed: 19204224]
7. Sciamanna CN, et al. Who reports receiving advice to lose weight? Results from a multistate survey. *Archives of Internal Medicine* 2000;160(15):2334–9. [PubMed: 10927731]
8. Stafford RS, et al. National patterns of physician activities related to obesity management. *Archives of Family Medicine* 2000;9(7):631–8. [PubMed: 10910311]
9. Taira DA, et al. The relationship between patient income and physician discussion of health risk behaviors. *Journal of the American Medical Association* 1997;278(17):1412–7. [PubMed: 9355999]
10. Anis NA, et al. Direct observation of physician counseling on dietary habits and exercise: patient, physician, and office correlates. *Prev Med* 2004;38(2):198–202. [PubMed: 14715212]
11. Coups EJ, Gaba A, Orleans CT. Physician screening for multiple behavioral health risk factors. *Am J Prev Med* 2004;27(2 Suppl):34–41. [PubMed: 15275672]
12. Glasgow RE, et al. Physician advice and support for physical activity: results from a national survey. *Am J Prev Med* 2001;21(3):189–96. [PubMed: 11567839]
13. Levy BT, Williamson PS. Patient perceptions and weight loss of obese adults. *Journal of Family Practice* 1988;27(3):285–90. [PubMed: 3418302]

14. Kant AK, Miner P. Physician advice about being overweight: association with self-reported weight loss, dietary, and physical activity behaviors of US adolescents in the National Health and Nutrition Examination Survey, 1999-2002. *Pediatrics* 2007;119(1):e142-7. [PubMed: 17200241]
15. Loureiro ML, Nayga RM Jr. Obesity, weight loss, and physician's advice. *Social Science and Medicine* 2006;62(10):2458-68. [PubMed: 16376006]
16. Huang J, et al. Physicians' weight loss counseling in two public hospital primary care clinics. *Academic Medicine* 2004;79(2):156-61. [PubMed: 14744717]
17. Kreuter MW, Chheda SG, Bull FC. How does physician advice influence patient behavior? Evidence for a priming effect. *Archives of Family Medicine* 2000;9(5):426-33. [PubMed: 10810947]
18. Thomas SB, Fine MJ, Ibrahim SA. Health disparities: the importance of culture and health communication. *American Journal of Public Health* 2004;94(12):2050. [PubMed: 15612166]
19. National Center for Health Statistics. Healthy People 2000 Review, 1998-99. Public Health Service; Hyattsville, Maryland: 1999.
20. US Department of Health and Human Services. Healthy People 2010: Understanding and Improving Health. U.S. Government Printing Office; Washington, DC: Nov. 2000
21. National Center for Health Statistics. 2005 NAMCS Micro-data file documentation. 2006.
22. Kristeller JL, Hoerr RA. Physician attitudes toward managing obesity: differences among six specialty groups. *Preventive Medicine* 1997;26(4):542-9. [PubMed: 9245677]
23. National Heart Lung and Blood Institute. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults--The Evidence Report. National Institutes of Health. *Obesity Research* 1998;6(Suppl 2):51S-209S. [PubMed: 9813653]
24. Bardia A, et al. Diagnosis of obesity by primary care physicians and impact on obesity management. *Mayo Clinic Proceedings* 2007;82(8):927-32. [PubMed: 17673060]
25. Ferraro KF, Holland KB. Physician evaluation of obesity in health surveys: "who are you calling fat?". *Social Science and Medicine* 2002;55(8):1401-13. [PubMed: 12231017]
26. Fallon EA, Wilcox S, Laken M. Health care provider advice for African American adults not meeting health behaviour recommendations. *Preventing Chronic Disease* 2006;3(2):1-12.
27. Ogden CL, et al. Prevalence of overweight and obesity in the United States, 1999-2004. *Journal of the American Medical Association* 2006;295(13):1549-55. [PubMed: 16595758]
28. Timmerman GM, Reifsnider E, Allan JD. Weight management practices among primary care providers. *Journal of the American Academy of Nurse Practitioners* 2000;12(4):113-6.
29. Block JP, DeSalvo KB, Fisher WP. Are physicians equipped to address the obesity epidemic? Knowledge and attitudes of internal medicine residents. *Preventive Medicine* 2003;36(6):669-75. [PubMed: 12744909]
30. Kushner RF. Barriers to providing nutrition counseling by physicians: a survey of primary care practitioners. *Preventive Medicine* 1995;24(6):546-52. [PubMed: 8610076]
31. Leverence RR, et al. Obesity counseling and guidelines in primary care: a qualitative study. *Am J Prev Med* 2007;32(4):334-339. [PubMed: 17383565]
32. Laws RA, et al. Explaining the variation in the management of lifestyle risk factors in primary health care: a multilevel cross sectional study. *BMC Public Health* 2009;9:165. [PubMed: 19480660]
33. Hoppe R, Ogden J. Practice nurses' beliefs about obesity and weight related interventions in primary care. *Int J Obes Relat Metab Disord* 1997;21(2):141-6. [PubMed: 9043969]
34. Epstein L, Ogden J. A qualitative study of GPs' views of treating obesity. *British Journal of General Practice* 2005;55(519):750-4. [PubMed: 16212849]
35. Hebl MR, Xu J. Weighing the care: physicians' reactions to the size of a patient. *International Journal of Obesity Related Metabolic Disorders* 2001;25(8):1246-52.
36. Price JH, et al. Family practice physicians' beliefs, attitudes, and practices regarding obesity. *American Journal of Preventive Medicine* 1987;3(6):339-45. [PubMed: 3452374]
37. Anderson DA, Wadden TA. Treating the obese patient. Suggestions for primary care practice. *Archives of Family Medicine* 1999;8(2):156-67. [PubMed: 10101987]

38. Hash RB, et al. Does physician weight affect perception of health advice? *Preventive Medicine* 2003;36(1):41–4. [PubMed: 12473423]
39. Brotons C, et al. Dietary advice in clinical practice: the views of general practitioners in Europe. *Am J Clin Nutr* 2003;77(4 Suppl):1048S–1051S. [PubMed: 12663317]
40. Billington CJ. The challenge of obesity management in primary care. *Journal of the American Board of Family Practice* 2000;13(3):222–3. [PubMed: 10826874]
41. Foster GD, et al. Primary care physicians' attitudes about obesity and its treatment. *Obesity Research* 2003;11(10):1168–77. [PubMed: 14569041]
42. Frank E, et al. Personal and professional nutrition-related practices of US female physicians. *American Journal Of Clinical Nutrition* 2002;75(2):326–32. [PubMed: 11815326]
43. Cabana MD, et al. Why don't physicians follow clinical practice guidelines? A framework for improvement. *Journal of the American Medical Association* 1999;282(15):1458–65. [PubMed: 10535437]
44. See Dartmouth Atlas website: www.dartmouthatlas.org
45. Wennberg, JE., et al. *Tracking the Care of Patients with Severe Chronic Illness: The Dartmouth Atlas of Health Care* 2008. The Trustees of Dartmouth College; 2008.
46. Stange KC, et al. How valid are medical records and patient questionnaires for physician profiling and health services research? A comparison with direct observation of patients visits. *Medical Care* 1998;36(6):851–67. [PubMed: 9630127]
47. Gilchrist VJ, et al. A comparison of the National Ambulatory Medical Care Survey (NAMCS) measurement approach with direct observation of outpatient visits. *Medical Care* 2004;42(3):276–80. [PubMed: 15076827]
48. Cherry DK, Woodwell DA, Rechtsteiner EA. National Ambulatory Medical Care Survey: 2005 summary. *Advance Data* 2007;(387):1–39. [PubMed: 17703793]
49. Blackburn G. Effect of degree of weight loss on health benefits. *Obesity Research* 1995;3(Suppl 2):211s–216s. [PubMed: 8581779]
50. Williamson DF. Intentional weight loss: patterns in the general population and its association with morbidity and mortality. *Int J Obes Relat Metab Disord* 1997;21(Suppl 1):S14–9. discussion S20–1. [PubMed: 9130036]
51. Campbell K, et al. Obesity management: Australian general practitioners' attitudes and practices. *Obesity Research* 2000;8(6):459–66. [PubMed: 11011913]
52. Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness: the chronic care model, Part 2. *JAMA* 2002;288(15):1909–14. [PubMed: 12377092]

Figure 1.
Obesity Prevalence and Physician Diagnosis of Obesity among Obese U.S. Adults

Table 1

Characteristics of the study population, obese adults (N = 2,458)

Sociodemographic characteristics		%
Race/ethnicity	White	75.3
	Black	10.3
	Hispanic	10.8
Gender	Female	57.6
	Male	42.4
Age	18-29	8.4
	30-44	23.2
	45-64	44.3
	65+	24.1
Insurance	Non-private	38.6
	Private	57.0
Region	Northeast	12.3
	Midwest	32.0
	South	36.8
	West	18.9
Co-morbidity risk status	Very high risk	13.7
	High risk	46.0
	Lower risk	40.3
Obesity class	Class I (BMI ≥ 30 & < 35)	54.3
	Class II (BMI ≥ 35 & < 40)	24.7
	Class III (BMI ≥ 40)	21.0
Physician specialty	Primary care	62.6
	Cardiology and other internal medicine specialties	10.4
	OB/GYN	5.2
	Surgical care specialties	14.4
	Other medical care specialties	7.3
Characteristics of clinical encounter		
Visit type	Preventive	14.8
	Chronic, ongoing	36.6
	Acute visit	46.0
Seen before by anyone in practice		86.7
Time spent with doctor	0-12 minutes	18.5
	13-24 minutes	51.2
	> 24 minutes	29.4
Obesity diagnosis and counseling	Obesity diagnosis	28.9
	Weight reduction counseling	17.6
	Diet counseling	25.2
	Exercise counseling	20.5

Note: Primary care includes: general internal medicine; general/family practice and pediatrics. Chronic, ongoing visits include: acute; chronic problem, flare-up; and pre/post surgery. Numbers may not sum to 100% due to rounding error. Data were weighted to be representative of the general population.

Table 2

Adjusted predictors of obesity diagnosis and weight-related counseling among obese adults

		Obesity Diagnosis		Weight Reduction Counseling		Diet Counseling		Exercise Counseling	
		OR (95% CI)		OR (95% CI)		OR (95% CI)		OR (95% CI)	
Race/ethnicity	Black	0.98 (0.63, 1.52)		1.30 (0.81, 2.09)		0.85 (0.51, 1.39)		0.84 (0.48, 1.47)	
	Hispanic	0.86 (0.55, 1.33)		1.01 (0.57, 1.77)		1.28 (0.80, 2.05)		1.02 (0.67, 1.55)	
	White	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
Gender	Women	1.54 (1.14, 2.09)		1.26 (0.90, 1.75)		1.13 (0.85, 1.49)		1.12 (0.80, 1.55)	
	Men	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
Age	18-29	2.61 (1.37, 4.97)		1.84 (0.81, 4.18)		1.15 (0.53, 2.51)		1.03 (0.47, 2.27)	
	30-44	1.55 (0.92, 2.64)		2.19 (1.08, 4.41)		1.65 (0.91, 2.99)		0.96 (0.49, 1.86)	
	45-64	1.26 (0.84, 1.88)		1.25 (0.80, 1.96)		0.94 (0.58, 1.52)		0.77 (0.52, 1.15)	
	65+	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
Insurance	Private	1.04 (0.73, 1.47)		1.21 (0.82, 1.78)		1.11 (0.76, 1.61)		1.13 (0.75, 1.72)	
	Non-private	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
Region	Northeast	1.41 (0.79, 2.51)		2.81 (1.38, 5.74)		2.13 (1.17, 3.91)		2.03 (1.04, 3.97)	
	Midwest	1.78 (1.08, 2.93)		1.36 (0.72, 2.55)		1.42 (0.82, 2.47)		1.02 (0.53, 1.96)	
	West	1.20 (0.64, 2.26)		0.79 (0.41, 1.55)		0.79 (0.44, 1.42)		0.81 (0.41, 1.60)	
	South	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
	Very high	1.48 (0.90, 2.46)		2.91 (1.43, 5.92)		2.84 (1.59, 5.06)		1.93 (0.97, 3.83)	
Co-morbidity risk status ^a	High	1.40 (0.95, 2.06)		2.26 (1.36, 3.77)		1.98 (1.28, 3.06)		1.94 (1.21, 3.09)	
	Lower	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
	Class III (BMI ≥ 40)	4.36 (3.09, 6.16)		0.97 (0.62, 1.50)		1.13 (0.78, 1.63)		1.01 (0.68, 1.50)	
Obese class	Class II (BMI ≥ 35 & < 40)	2.08 (1.53, 2.83)		0.90 (0.63, 1.28)		0.86 (0.61, 1.19)		0.89 (0.63, 1.24)	
	Class I (BMI ≥ 30 & < 35)	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
	Primary care	1.32 (0.78, 2.22)		2.36 (1.14, 4.86)		1.99 (0.87, 4.58)		1.01 (0.47, 2.14)	
Physician Specialty	Cardiology and other internal medicine specialties	2.22 (1.09, 4.56)		4.01 (1.49, 10.74)		4.17 (1.57, 11.08)		1.51 (0.60, 3.77)	
	OB/GYN	0.63 (0.25, 1.59)		1.28 (0.49, 3.36)		2.10 (0.78, 5.60)		0.57 (0.22, 1.46)	
	Other medical care specialties	0.94 (0.42, 2.08)		0.79 (0.32, 1.95)		0.67 (0.23, 1.95)		0.17 (0.06, 0.46)	
	Surgical care specialties	1.00 (Reference)		1.00 (Reference)		1.00 (Reference)		1.00 (Reference)	
	Preventive	0.89 (0.57, 1.40)		1.79 (1.12, 2.85)		1.61 (1.09, 2.39)		2.00 (1.27, 3.15)	

	Obesity Diagnosis	Weight Reduction Counseling	Diet Counseling	Exercise Counseling
Chronic, ongoing	1.33 (0.95, 1.85)	1.16 (0.78, 1.70)	1.45 (0.99, 2.11)	1.58 (1.06, 2.35)
Acute visit	1.00 (Reference)	1.00 (Reference)	1.00 (Reference)	1.00 (Reference)
Seen before, anyone in practice (yes = 1)	1.21 (0.78, 1.87)	0.93 (0.54, 1.58)	1.16 (0.75, 1.79)	1.06 (0.69, 1.61)
Time spent with doctor				
>24 minutes	1.53 (0.95, 2.4)	2.92 (1.40, 6.09)	2.84 (1.62, 4.96)	3.68 (1.99, 6.82)
13-24 minutes	0.98 (0.60, 1.57)	2.18 (0.99, 4.77)	1.76 (1.02, 3.04)	2.14 (1.16, 3.95)
0-12 minutes	1.00 (Reference)	1.00 (Reference)	1.00 (Reference)	1.00 (Reference)
Obesity diagnosis (yes = 1)		5.72 (4.01, 8.17)	2.89 (2.05, 4.06)	2.54 (1.67, 3.85)
Pseudo R ²	11.2	16.7	13.2	9.2
N	2248	2248	2248	2248

Note: Primary care includes: general internal medicine; general/family practice and pediatrics. Chronic, ongoing visits include: acute; chronic problem, flare-up; and pre/post surgery. Data were weighted to be representative of the general population. CI = Confidence Interval. 2005 National Ambulatory Medical Care Survey.

^a Patient were classified as very high risk if they had ischemic heart disease, diabetes, sleep apnea or other atherosclerotic diseases; high risk if they had any one of the following: osteoarthritis, gallstones, stress incontinence, hyperlipidemia, hypertension, smoked cigarettes or were men aged 45 and older, or women aged 55 years or older; and lower risk if they were obese but had no other obesity-related risk factors.