# Recognition And Management Of Obesity In A Family Practice Setting

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***Background:*** **Research on the diagnosis and management of obesity in primary care is limited. Our study goals were to describe the rate of obesity in a primary care setting, to identify factors associated with clinically recognized obesity, and to ascertain the level of diet and exercise counseling for obesity.**

***Methods:*** **Medical records from a private group practice were used for a historical cohort study of 276 patients (aged 40 years and older) who were provided care for a maximum 4.5-year follow-up period.**

***Results:*** **Forty-six percent of the study patients (95 percent confidence interval = 0.43, 0.49) received an obesity diagnosis according to medical record notations. The diagnosis of obesity, in turn, was predicted by body mass index (BMI) quartile ($P < 0.001$) and a positive family history of cardiovascular disease ($P < 0.01$). Those patients with a diagnosis of obesity had a higher mean level of subsequent weight and diet counseling ($P = 0.0001$) but the same level ($P = 0.11$) of exercise counseling as nonobese patients. Weight and diet counseling was also predicted by diabetes ($P = 0.0001$) and hypercholesterolemia ($P = 0.0003$).**

***Conclusions:*** **The clinical recognition of obesity was not determined by BMI alone. Although weight and diet counseling was initiated for those individuals described as obese, there was a relatively low level of exercise counseling among these patients. Additional research could provide ways of reducing both physician and patient barriers to exercise counseling.** **(J Am Board Fam Pract 1993; 6:457-463.)**

Obesity is a major public health problem in the United States, as well as in other countries where high-sucrose and high-fat foods are accessible at a low cost and the need for daily physical activity has been reduced or eliminated.[1,2] Obesity (excess body fat) contributes to ischemic heart disease, stroke, congestive heart failure, sex hormone sensitive cancers, noninsulin-dependent diabetes, infertility, gall stones, respiratory disease, osteoarthritis, and back pain.[3] Obesity can also reduce the potential benefits of early detection of breast cancer.[4]

An estimate of the proportion of US adults with an obesity problem depends on both the obesity measure employed[5-7] and the cut points used to distinguish optimal fatness from moderate and severe obesity. The *Healthy People 2000* report[2] uses the 85th percentile of the US distribution of body mass index (BMI) from persons aged 20 to 29 years[7,8] to estimate the national prevalence of overweight persons among all adults. These BMI cut points (27.8 for men and 27.3 for women) are greater than the BMI levels associated with the lowest risk of coronary heart disease in the Nurses Health Study (< 21 for women) and in the Framingham Heart Study (< 24 for men).[9,10] Using these and other data,[8] one can infer that moderate-to-large increases greater than the optimal body mass index can be found in one-third to one-half of all adults in the United States.

Despite the high prevalence of obesity and its etiologic involvement in many debilitating chronic or fatal diseases, obesity is generally underdiagnosed and undertreated in primary care settings.[11-13] Garrow[3] writes that "we lack any systematic information about what [primary care] practitioners do for their obese patients and with what effect, and we do not know what proportion of practices regard obesity as a cosmetic problem for which the remedies are available from commercial [diet-exercise] clinics."[p706] Lewis[13] lists 12 studies of dietary counseling and 10 studies of exercise counseling in the context of primary care. Most of these studies are cross-sectional surveys of physician behavior. Weight control has also

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been studied in the context of hypertension[14,15] or diabetes.[16-18] There are only a few studies, however, dealing with the diagnosis and management of obesity in relatively unselected consecutive primary care patients.[19]

As part of a larger study of medical care utilization and health promotion, we initiated a preliminary inquiry into the recognition and management of obesity in primary care. Our study had four goals: first, to describe the prevalence and clinical correlates of obesity in a primary care setting; second, to determine which clinical factors, in addition to the actual body mass index, are associated with physician recognition of obesity; third, to describe patterns and determinants of physician intervention for the obese patient; and fourth, to determine whether the medical care utilization of obese patients differs from that of nonobese patients.

## Methods

The study setting was a private group practice staffed by 5 board-certified family physicians. This practice was located in a small midwestern city and served a mostly white, middle-income patient population of about 20,000.

Medical records were used as the data source for a historical cohort study. In this study design, existing records from a past time were used to select a group of patients and to document their risk factors at that time.[20] These patients were then followed forward from the time of selection using the information in their medical records.

The cohort of persons in this study were patients aged 40 years or older who had at least one office visit between 1 July 1984 and 30 June 1985 and one additional visit. The index office visit, which entered an individual into the study, served as the "start date" for that person's follow-up period. Charts of study members were reviewed until the earliest of the following occurred: 31 December 1988, the patient withdrew from the Family Practice Center, or the patient died. This study design allowed a maximum of 4.5 years of follow-up for each individual. All medical records were systematically sampled to obtain a representative sample of persons meeting the study entry criteria. All data were abstracted by a nurse trained in research procedures.

A body mass index (BMI) ([mass in kilograms]/[square of height in meters]) was calculated from the weight (in pounds) and height (in feet and inches) recorded at the index office visit or as soon afterward as this information was found in the chart. A notation anywhere in the chart that the patient was overweight or obese was used to indicate clinically recognized obesity. Skinfolds and other measures of central adiposity were not available.

There were also no available data concerning management outcomes, such as weight loss or a decrease in clinically recognized obesity, because the original data were collected for a more general study of physician compliance with health promotion and disease prevention guidelines. There were no special obesity monitoring efforts or expansion of the counseling program at the practice site during the interval of data collection. The study data should reflect standard care in a private group practice with residency-trained family physicians.

Patient characteristics that were abstracted included age and sex, marital status, pregnancy history and menopausal status for women, previous myocardial infarction, hypertension, hypercholesterolemia, stroke, diabetes, cancer, and depression or mental illness, as well as tobacco and alcohol consumption. The medical records were reviewed for a family history of cardiovascular disease, hypertension, cancer, and diabetes. These data and the obesity data were recorded from the part of the patient's medical record that predated the study start date.

Patterns of medical care for each patient subsequent to the study start date were characterized by a count of office visits, emergency department visits, and hospitalizations. Physical examination was an exclusive category that depended on the patient's stated intention and required examination of multiple systems. All encounters were included even if the patient did not see a physician.

Raw data were double keyed and verified from the abstraction forms and subjected to extensive logic and edit checks before data analysis. A 95 percent confidence interval (CI) estimate of the proportion of clinically obese patients in each BMI quartile was obtained from an approximate binomial algorithm.[21] Proportions contrasting the medical histories of clinically obese and nonobese patients were compared with chi-square tests or Fisher exact test.[22] Logistic regression analysis[22] was used to indicate independent predictors of clinically recognized obesity. Mean levels of medical care utilization and counseling were compared using t-tests or analysis of variance and adjusted for potential confounders by analysis of covariance.[23] SAS statistical software[24] running on an HP 9000/835 minicomputer was used for data management and analysis.

## Results

Available data indicate that our men and women study patients have BMI distributions similar to those of the US population. A sex-specific comparison of the BMI distributions of our middle-aged primary care patients with corresponding age-adjusted BMI distributions from the NHANES II[8] general population sample showed no important differences.

### *Diagnosis*

Table 1 shows the relation between the BMI and the clinical recognition of obesity in this primary care sample. When patients' BMIs fell in the fourth quartile of the BMI distribution (a BMI equal to or greater than 29.1 for women or men) 92.8 percent (95 percent CI = 0.884, 0.957) were described as obese or overweight. When the patients' BMIs fell in the third or the second quartiles, however, the probability of clinical recognition of obesity decreased to 70.2 percent (95 percent CI = 0.638, 0.758) or 18.6 percent (95 percent CI = 0.140, 0.242), respectively.

We were interested in the sex and ages of the 4 patients with low BMIs who were labeled as clinically obese, and the 5 patients with high BMIs who were not labeled as obese. The 4 patients with low BMIs were 3 women — aged 42, 57, and 75 years — and 1, 61-year-old man. The 5 patients with high BMIs were 3 men — aged 41, 73, and 74 years — and 2 women, aged 60 and 71 years.

**Table 1. Number and Percent of Patients with Clinically Recognized Obesity by Body Mass Index (BMI) Quartile.**

| | Clinically Obese | | |
|---|---|---|---|
| | Yes | No | Total |
| BMI Quartile* | No. (%) | No. (%) | No. (%) |
| 1 | 4 (5.7) | 66 (94.3) | 70 (100) |
| 2 | 13 (18.6) | 57 (81.4) | 70 (100) |
| 3 | 47 (70.2) | 20 (29.9) | 67 (100) |
| 4 | 64 (92.8) | 5 (7.3) | 69 (100) |
| Total | 128 (46.4) | 148 (53.6) | 276 (100) |

*Men quartiles: (1) < 23.6, (2) 23.6–25.8, (3) 25.9–29.1, (4) > 29.1. Women quartiles: (1) < 22.5, (2) 22.5–25.3, (3) 25.4–29.1, (4) > 29.1.

We had hypothesized that recognition and treatment of obesity would be influenced by both the personal and the family medical history. Table 2 shows that clinically recognized obese patients were more likely to be in the 50- to 59-year age group and less likely to be in the 70-year and older age group ($P = 0.002$). They were also more likely to have a personal history of hypertension ($P = 0.04$) or hypercholesterolemia ($P = 0.04$) and a family history of cardiovascular disease ($P < 0.001$) or diabetes ($P = 0.05$). Sex, smoking and alcohol use (not shown in the table), marital status, and menopausal or reproductive history among women were unrelated to the clinical recognition of obesity.

We used logistic regression analysis to determine whether any of the personal or family history variables listed in Table 2 predicted clinically recognized obesity when the BMI quartile was controlled. Our analysis indicated that a family history of cardiovascular disease was predictive of clinically recognized obesity (adjusted odds ratio = 2.66, $P < 0.01$) when the family history of cardiovascular disease variable was forced into the same model along with the BMI quartile variables. No other personal or family history factor shown in Table 2 remained a significant predictor of obesity recognition when these factors were forced to compete with the BMI quartile and family history of cardiovascular disease in the same model.

### *Management*

An analysis of mean utilization (per patient) adjusted for age, sex, and length of follow-up showed that clinically obese patients averaged significantly more physical examinations (1.2 versus 0.7, $P = 0.004$) during the follow-up period. This result was not changed by the addition of seven personal history variables (Table 2) to the covariance model. The BMI quartile did not predict the number of subsequent physical examinations. The mean number of office visits, emergency department visits, or hospitalizations was also not increased among clinically obese patients or patients in the third or fourth BMI quartiles.

**Table 2. Personal and Family Medical Histories of Clinically Recognized Obese (n = 128) and Nonobese (n = 148) Primary Care Patients.**

| Medical History | Obese No. (%) | Nonobese No. (%) |
|---|---|---|
| Sex | | |
| Women | 78 (60.9) | 83 (56.1) |
| Men | 50 (39.1) | 65 (43.9) |
| Age group (years) | | |
| 40–49 | 30 (23.4) | 40 (27.0)* |
| 50–59 | 45 (35.2) | 28 (18.9) |
| 60–69 | 36 (28.1) | 38 (25.7) |
| 70+ | 17 (13.3) | 42 (28.4) |
| Personal history | | |
| Myocardial infarction | 15 (11.7) | 11 (7.4) |
| Hypertension | 68 (53.1) | 60 (40.5)† |
| Hypercholesterolemia | 11 (8.6) | 4 (2.7)† |
| Stroke | 2 (1.6) | 4 (2.7) |
| Diabetes | 15 (11.7) | 9 (6.1) |
| Cancer | 10 (7.8) | 16 (10.8) |
| Depression or mental illness | 6 (4.7) | 9 (6.1) |
| Smoking history | | |
| Never | 68 (53.1) | 89 (60.1) |
| Past | 21 (16.4) | 15 (10.1) |
| Current | 39 (30.5) | 44 (29.7) |
| Marital status | | |
| Married | 101 (78.9) | 113 (76.4) |
| Other | 27 (21.1) | 35 (23.7) |
| Family history | | |
| Cardiovascular disease | 101 (78.9) | 85 (57.4)‡ |
| Hypertension | 35 (27.3) | 36 (24.3) |
| Stroke | 18 (14.1) | 30 (20.3) |
| Cancer | 56 (43.8) | 63 (42.6) |
| Diabetes | 44 (34.4) | 35 (23.7)§ |

*$P$ = 0.002, $df$ = 3. †$P$ = 0.04. ‡$P$ < 0.001. §$P$ = 0.05.

Figures 1 and 2 show distributions of weight and diet and exercise counseling rates (episodes per year of follow-up) stratified by the baseline clinical obesity classification. Table 3 shows the mean levels of weight and diet and exercise counseling adjusted for sex, age, and length of follow-up by analysis of covariance. Clinically recognized obese patients experienced a significantly ($P$ = 0.0001) higher mean level of weight and diet counseling; however, clinically obese and nonobese patients experienced essentially the same average level of exercise counseling ($P$ = 0.11). A similar covariance-adjusted analysis of mean counseling levels by BMI quartile showed that the increase in mean weight and diet counseling levels was confined to patients in the third and fourth BMI quartiles. Exercise counseling was uniformly low across all four BMI quartiles. Figure 1 shows that only 10.9 percent of clinically recognized obese patients (95 percent CI = 0.083, 0.143) had no weight and diet counseling recorded in their medical records. Figure 2 shows that 46.1 percent of obese patients (95 percent CI = 0.416, 0.507) had no exercise counseling recorded in their medical records.

Finally, we used linear regression analysis to look for independent predictors of the mean number of occurrences of weight and diet counseling or exercise counseling, respectively (after adjusting for sex, age, and follow-up). A history of diabetes was the strongest predictor of subsequent weight and diet counseling (a difference of 4.3 sessions with a 95 percent CI = 2.53, 6.17), followed by a history of hypercholesterolemia (a difference of 3.2 sessions, 95 percent CI = 1.25, 5.15), and physician recognition of obesity (a difference of 1.7 sessions, 95 percent CI = 0.11, 3.36).

There were also smaller effects of the presence of hypercholesterolemia, diabetes, or a previous myocardial infarction on subsequent exercise counseling (mean differences: 1.0 with 95 percent CI = −0.23, 2.25; 1.5 with 95 percent CI = 0.32, 2.63; and 1.4 with 95 percent CI = 0.24, 2.57, respectively). Clinically recognized obesity was not a predictor of the occurrence of exercise counseling.

## Discussion

Our data are consistent with the proposition that severe and moderately elevated BMIs are widespread in primary care settings. Forty-six percent of the study patients (95 percent CI = 0.43, 0.49) were clinically obese according to medical record notations. The data also indicate that patients were most likely to be labeled (in the medical record) as obese or overweight if their BMI placed them in the fourth quartile (BMI > 29). With the

**Table 3. Adjusted Mean Weight and Diet and Exercise Counseling Occurrences by Clinically Recognized Obesity.**

| Counseling Type | Obese Adjusted* Mean (SE) | Nonobese Adjusted Mean (SE) | $t$ Statistic | $P$ Value |
|---|---|---|---|---|
| Weight and diet | 4.58 (0.32) | 2.36 (0.29) | 5.17 | 0.0001 |
| Exercise | 1.60 (0.19) | 1.18 (0.18) | 1.63 | 0.11 |

*Adjusted for sex, age, and follow-up by analysis of covariance; n = 276.

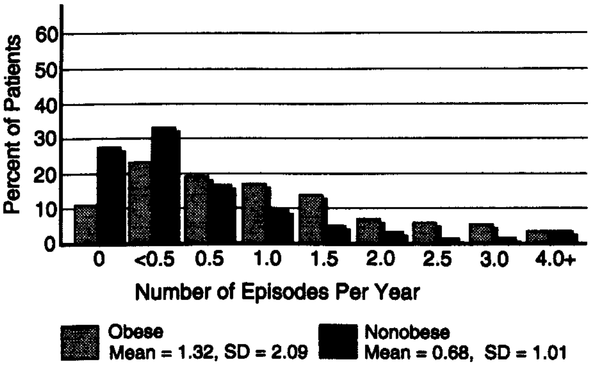


**Figure 1. Distributions of weight and dietary counseling episodes per year for clinically recognized obese n = 128) and nonobese (n = 148) primary care patients.**

exception of a family history of cardiovascular disease, none of the other family or personal history factors abstracted from the medical record influenced the diagnosis of clinical obesity. A larger study, in a different setting, with a prospective design and primary data collection could find different results. Unmeasured factors, such as the degree of central adiposity (assessed by looking at the patient) or the physician's personal standard of the ideal body weight, might influence the decision to label certain patients as obese or overweight and other patients with the same BMI as normal by default.

Our data are also consistent with the proposition that physician recognition of obesity is not necessarily followed by appropriate interventions.[19] With respect to the management of obesity, our data indicated that patients with recognized obesity have more subsequent physical examinations than nonobese patients of the same sex, age, and personal medical history with the same length of follow-up. This observation raises the possibility that labeling patients as obese or overweight changes the patient's or the physician's perception of the need for additional physical examinations, but unmeasured comorbidity among clinically obese patients could still account for the physical examination difference. If clinical obesity (as opposed to BMI) is the relevant construct, then it is not surprising that BMI does not predict physical examinations because BMI is an imperfect predictor of clinical obesity. Random misclassification of the exposure (using BMI instead of clinical obesity) makes it more difficult to find associations between exposure (clinical obesity) and the outcome of interest (number of physical examinations).[22]

Obese and normal weight patients had similar numbers of office visits, hospitalizations, and emergency department visits. Seidell, et al.[25] observed that moderate and severe overweight was associated with increased utilization of medical care and medications in a general population sample. Recognized obese patients in our primary care setting also received more weight and diet counseling sessions but similar numbers of exercise counseling sessions as nonobese patients of the same sex and age and with the same length of follow-up.

To place our exercise counseling data in perspective, we note that the observed rate of exercise counseling among clinically recognized obese patients (39.3 occurrences per 100 person-years) was even lower than the observed rate of dietary counseling in the nonobese patients (62.2 occurrences per 100 person-years). This latter observation is at variance with current recommendations on the importance of increased physical activity, dietary changes, and behavior modification for the optimal management of obesity[26-28] and with importance of physical activity counseling for healthy adults[29] as a primary prevention intervention. We have no information, however, on the occurrence of exercise-limiting arthritis or other similar disabilities in our study patients. It also should be noted that busy physicians might discuss the benefits of regular physical activity with their patients more often than it is noted in the chart.

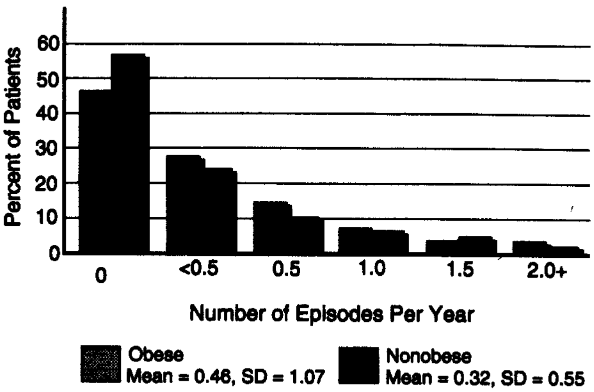


**Figure 2. Distribution of exercise counseling episodes per year for clinically recognized obese (n = 128) and nonobese (n = 148) primary care patients.**

Our examination of potential predictors of the number of weight and dietary counseling sessions showed that a history of diabetes, hypercholesterolemia, or obesity was the only independent predictor among those examined. These results are consistent with the 1985 statement of the National Institutes of Health consensus panel on the health implications of obesity,[30] which stated that treatment should be considered when the BMI is less than 27.8 for men or 27.3 for women if there is a history of diabetes, hypertension, hypercholesterolemia, or hypertriglyceridemia.

According to Jeffery,[1] obesity is such a major problem that we should consider public health interventions, such as increased regulation of food processing, limitations on food and restaurant advertising, and excise taxes on food according to sugar and fat content. To complement these public health interventions against obesity, primary care physicians need to become aggressive about recognizing and treating both moderate and severe obesity and central adiposity by means of a stepped-care program[31] that stresses dietary change, increased physical activity, and behavior modification with periodic patient follow-up and referral as needed.

This stepped-care program borrows the principles that have been successfully used to improve the diagnosis and management of essential hypertension during the last two decades. Selected anthropometric measurements could be consistently recorded for all new patients and periodically retaken by nursing personnel. Percentage of ideal weight, using Metropolitan Life Insurance Standards, for example, might be inadequate to assess the amount of excess adipose tissue on middle-aged and older adults.[5-7] Egger[32] has recently summarized much of the data that support the routine collection of hip-waist ratio information from all adult primary care patients. Other anthropometric measurements that might be used to locate patients along the lean-obese continuum include the BMI, various skinfolds (triceps, subscapular, or abdominal), or the recumbent sagittal diameter.[33] These measurements could also be used to evaluate the adequacy of previous obesity counseling or referrals similar to the manner in which current blood pressure is used to evaluate the adequacy of antihypertensive therapy.

Unlike many hypertensive or diabetic patients, most obese patients seen in primary care are not candidates for pharmacologic therapy. Rather, these patients are candidates for behavioral therapy and change. A variety of different stepped interventions for the treatment of obesity could be instituted based on the patient's current degree and type of obesity, current eating and exercise patterns, previous attempts to lose weight, the patient's social situation, and comorbidity. This stepped-care management strategy is part of a more comprehensive, integrated, and systematic clinical and community approach to the obesity problem.

Research, however, has not yet sorted out the best ways of fitting this stepped-care approach to obesity management into primary care settings. What might be the most appropriate role for the physician in the management of obesity has yet to be answered. Obtaining adequate reimbursement or compensation for the time and effort spent diagnosing and managing obesity is part of a larger ongoing problem that frustrates health promotion and disease prevention in primary care. Nevertheless, further attention paid to the technical process of diagnosing and managing obesity should yield better outcomes and higher quality care. The status quo is not very satisfactory, the rate of obesity is increasing,[2] and obesity sequelae are contributing to the costly disease burden borne by many patients and society.[3,4]

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