

Suboptimal Identification of Obesity by Family Physicians

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Obesity is a major concern to public health in the 21st century. It is a growing epidemic in the United States¹ and in some European countries, where 1 in 5 adults is obese.² Obesity is considered a risk factor for various diseases such as coronary artery disease, cancer, diabetes, and osteoarthritis.³⁻⁶ In women, it is associated with depression.⁷ Moreover, it carries a high risk of hospitalization and mortality and negatively affects quality of life.^{8,9}

Guidelines from medical authorities such as the World Health Organization, National Institutes of Health, and US Preventive Services Task Force support the classification and assessment of obesity as an integral part of patients' medical care.¹⁰⁻¹² The classification of obesity starts with a body mass index (BMI [calculated as weight in kilograms divided by height in meters squared]) evaluation that defines overweight (BMI range, 25.0 to \leq 29.9) and obesity (BMI, \geq 30.0). Because obesity is associated with almost a 30% increase in overall mortality,¹³ it is of utmost importance for physicians to identify and manage this condition.

Physicians have a key role in identifying and counseling patients with obesity, as their advice has been shown to be an effective tool that could lead to weight loss and to increased physical activity.^{14,15} Furthermore, physicians serve as conduits to different healthcare resources such as dietitians, physical activity counselors, and obesity support groups.

However, several studies¹⁶⁻¹⁸ have demonstrated that physicians often fail to identify, diagnose, and manage obesity, although they are urged to do so. This may stem from a lack of knowledge and confidence in the treatment of obesity.¹⁹ Additional suggested barriers are insufficient time and inadequate compensation for weight counseling.²⁰ The failure to identify and treat obesity has a profound medical and economic effect on patients and healthcare systems.²¹

The primary objective of the study was to examine whether family physicians document their patients' BMI and diagnose obesity in their patients. The secondary objective was to recognize the variables that affect the likelihood of BMI documentation.

METHODS

The study setting comprised 7 urban family practices of Clalit Health Services (CHS) in Israel affiliated with the Department of Family Medicine at Tel Aviv University. The patients were allocated to 19 family physicians, all of whom had at least 1-year tenure

Objectives: To examine how family physicians identify and document obesity.

Study Design: Prospective cross-sectional study of 289 patients in 7 family practice clinics of Clalit Health Services in Israel.

Methods: Two hundred eighty-nine patients from 7 family practice clinics had their body mass index (BMI [calculated as weight in kilograms divided by height in meters squared]) determined by the study staff and subsequently compared with the data retrieved from the family practices' database regarding physicians' BMI documentation and obesity diagnosis. Demographic variables, comorbidities, and medication use were also extracted. Multivariate odds ratios (ORs) and 95% confidence intervals (CIs) were obtained to determine the predictors of BMI documentation.

Results: Seventy-eight of 289 patients (27.0%) were obese (BMI, \geq 30.0), and 126 (43.6%) were overweight (BMI range, 25.0 to \leq 29.9). Body mass index was documented in 39 of 78 obese patients (50.0%) and in 49 of 126 overweight patients (38.9%) ($P < .001$). Diagnosis of obesity was recorded in 19 of 78 obese patients (24.4%). Older patients (OR, 2.77; 95% CI, 1.39-5.49) and obese patients (OR, 2.04; 95% CI, 1.04-3.99) were more likely to have their weight and height measured and BMI calculated by their physician. Patients with comorbid conditions such as diabetes mellitus (OR, 4.35; 95% CI, 2.20-8.62) and hypertension (OR, 3.20; 95% CI, 1.71-5.99) and patients taking chronic medications (OR, 3.44; 95% CI, 1.20-9.83) were also more likely to have their BMI documented.

Conclusions: Family physicians failed to identify most obese and overweight patients, as seen by lack of BMI documentation and concordant diagnoses in the medical problem list. Determination of BMI by physicians in family practice is of utmost importance, and its incorporation into medical care should be optimized.

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Take-Away Points

Identification and management of obesity by family physicians are of utmost importance and should be optimized to battle the obesity epidemic.

- In this prospective study, family physicians failed to identify most obese and overweight patients.
- Patients with obesity-related disorders such as diabetes mellitus and hypertension were more likely to be identified, limiting primary prevention opportunities.
- Incorporation of body mass index calculation into routine medical care could assist physicians in the recognition and management of obesity.

129 (44.6%) patients were male (Table 1). The mean (SD) BMI was 27.7 (4.7); 126 patients (43.6%) were overweight (BMI range, 25.0 to ≤ 29.9), and 78 patients (27.0%) were obese (BMI, ≥ 30.0). The prevalent comorbid conditions were hyperlipidemia (39.8%), hypertension (34.3%), diabetes mellitus (22.8%),

and ischemic heart disease (15.9%). A total of 76.1% of patients used chronic medications.

in the family practice and at least a year-long rapport with the patients enrolled in the study. All of the patients had medical insurance coverage by CHS. This cross-sectional study was conducted during January 2004, following approval by CHS' local review board. A total of 384 patients were approached in the waiting rooms of the practices during a usual workday of each of 19 participating family physicians. All patients scheduled to see a participating physician were eligible for the study and were addressed. Pregnant patients, patients younger than 18 years, and patients not fluent in Hebrew were excluded. Of the patients approached, 303 (78.9%) consented to participate in the study. Because of missing data, 289 patients were included in the analysis.

Of 289 patients, 102 (35.3%) had their BMI calculated and documented by their family physician (Table 1). Among these patients, 14 patients (13.7%) had a normal BMI, 49 patients (48.0%) were overweight, and 39 patients (38.2%) were obese.

Following each visit, the patients' height, weight, and BMI were recorded by the study staff. Physicians and patients were blinded to the study's objectives. In addition, data regarding patients were extracted from the family practice's computerized medical record. These data included BMI documentation (weight, height, and BMI have designated fields within the electronic medical record) and diagnosis of obesity (in the patient's medical problem list). Additional data included patients' demographics and comorbidities (diabetes mellitus, hypertension, hyperlipidemia, ischemic heart disease, and chronic medication use). The number of medical encounters in the past 6 months was also noted. Additional data regarding lifestyle (physical activity and smoking), residence, and education level were gathered by the study staff.

Family physicians measured and documented BMI in 39 of 78 obese patients (50.0%), 49 of 126 overweight patients (38.9%), and 14 of 84 patients with a normal BMI (16.7%, $P < .001$) (Table 1). The mean (SD) BMI of patients with a documented BMI was significantly higher than that of patients without documentation (29.4 [4.4] vs 26.9 [4.6], $P < .001$). Also, patients with BMI documentation were significantly older than those without documentation (mean [SD] age, 63.7 [12.1] vs 50.6 [16.9] years, $P < .001$). Additional findings include more BMI documentation among men than among women, as well as in association with several comorbid conditions (Table 2). Furthermore, the mean (SD) number of medical visits in the past 6 months was significantly higher among patients with a documented BMI compared with patients without BMI documentation (9.8 [6.8] vs 6.9 [5.4], $P < .001$) (Table 1). The univariate analysis showed no independent effect for smoking status, sedentary lifestyle, and education level on the documentation of BMI (Table 2).

All statistical analyses were performed using the Statistical Package for the Social Sciences (version 15.0; SPSS Inc, Chicago, IL). Each potential predictor of BMI calculation was first assessed in univariate models (χ^2 test for categorical variables and t test for continuous variables), and significant univariate predictors were subsequently assessed in the stepwise logistic regression model to determine their independent effect, expressed as odds ratio (OR) and 95% confidence interval (CI). $P < .05$ was considered significant.

Of 78 obese patients, 19 (24.4%) had a concordant diagnosis in the medical records. This was more likely among patients with BMI documentation by the physician (14 of 39 [35.9%]) compared with patients without BMI documentation (5 of 39 [12.8%], $P = .02$).

RESULTS

To explore the independent effect of predictors of BMI documentation, a stepwise forward likelihood ratio multivariate logistic regression was performed on all univariate predictors associated with BMI documentation (Table 2). In the multivariate analyses (Table 3), older patients (OR, 2.77; 95% CI, 1.39-5.49) and obesity (OR, 2.04; 95% CI, 1.04-3.99) were significantly associated with BMI documentation. Also, diabetes mellitus (OR, 4.35; 95% CI, 2.20-8.62) and hypertension (OR, 3.20; 95% CI, 1.71-5.99) were significant predictors of BMI documentation, as was chronic medication use (OR, 3.44; 95% CI, 1.20-9.83).

A total of 289 patients were included in the final analysis. The mean (SD) age of patients was 54.9 (16.6) years, and

■ **Table 1.** Population Characteristics and Association With Body Mass Index (BMI) Documentation

Demographic Characteristic or Comorbid Condition	Overall (N = 289)	BMI Documentation		P
		Yes (n = 102)	No (n = 187)	
Age, mean (SD), y	54.9 (16.6)	63.7 (12.1)	50.6 (16.9)	<.001
Sex, No. (%)				
Male	129 (44.6)	55 (53.9)	74 (39.6)	.02
Female	160 (55.4)	47 (46.1)	113 (60.4)	
Lifestyle, No. (%)				
Smoker	59 (20.4)	15 (14.7)	44 (23.5)	.07
Sedentary	160 (55.4)	53 (52.0)	107 (57.2)	.36
Demographics, No. (%)				
Living alone	59 (20.4)	25 (24.5)	34 (18.2)	.42
Education level >12 y	86 (29.8)	25 (24.5)	61 (32.6)	.14
Medical history				
No. of medical visits in past 6 mo, mean (SD)	7.8 (6.0)	9.8 (6.8)	6.9 (5.4)	<.001
Diabetes mellitus, No. (%)	66 (22.8)	48 (47.1)	18 (9.6)	<.001
Hypertension, No. (%)	99 (34.3)	64 (62.7)	35 (18.7)	<.001
Hyperlipidemia, No. (%)	115 (39.8)	60 (58.8)	55 (29.4)	<.001
Ischemic heart disease, No. (%)	46 (15.9)	22 (21.6)	24 (12.8)	.05
Heart failure, No. (%)	16 (5.5)	5 (4.9)	11 (5.9)	.73
Chronic medication use, No. (%)	220 (76.1)	97 (95.1)	123 (65.8)	<.001
Physical characteristics				
Weight, kg, mean (SD)	75.1 (16.2)	79.2 (15.9)	73.0 (15.8)	.02
Height, cm, mean (SD)	164.3 (9.3)	163.7 (9.4)	164.4 (9.4)	.59
BMI, mean (SD) ^a	27.7 (4.7)	29.4 (4.4)	26.9 (4.6) ^b	<.001
Normal, No. (%)	84 (29.1)	14 (13.7)	70 (37.4)	<.001
Overweight, No. (%)	126 (43.6)	49 (48.0)	77 (41.2)	.28
Obese, No. (%)	78 (27.0)	39 (38.2)	39 (20.9)	.002

^aCalculated as weight in kilograms divided by height in meters squared.
^bPartially missing data for 1 patient.

DISCUSSION

This study shows that family physicians calculate and document BMI in few overweight and obese patients and less frequently add the diagnosis of obesity to the patient's medical problem list. Practical guidelines from medical authorities such as the National Institutes of Health¹¹ and the US Preventive Services Task Force¹² emphasize family physicians' role in promoting a healthy lifestyle in an effort to decrease the obesity epidemic.

Our findings are consistent with previous findings. Studies^{16,17,22,23} have shown that practicing family physicians and resident physicians failed to identify and manage obesity in a large proportion of obese patients.

Several potential barriers to weight management exist in family practice. There are barriers on the physician's part such as lack of knowledge needed to treat obesity, time limitations, pessimistic views about weight-loss prospects, and lack of reimbursement within the healthcare system.^{19,24} Other barriers from the patient's perspective include embarrassment, social stigma associated with obesity, and lack of motivation.²⁵

Identifying obesity could be simplified by determining the BMI in physician-patient encounters. This should lead to a discussion about weight issues with patients in a non-judgmental manner that could motivate patients to pursue a healthier lifestyle. Moreover, studies^{14,15} have found that weight counseling by physicians is effective and improves patients' chances of losing weight and keeping physically

■ **Table 2.** Rate of Body Mass Index (BMI) Documentation by Different Clinical and Demographic Variables^a

Variable	BMI Documentation, No. (%)	P
Clinical		
BMI		<.001
Normal	14/84 (16.7)	
Overweight	49/126 (38.9)	
Obese	39/78 (50.0)	
Age, y		<.001
≥55	81/160 (50.6)	
<55	21/129 (16.3)	
Sex		.02
Male	55/129 (42.6)	
Female	47/160 (29.4)	
Medical		
Diabetes mellitus		<.001
Yes	48/66 (72.7)	
No	54/223 (24.2)	
Hypertension		<.001
Yes	64/99 (64.6)	
No	38/190 (20.0)	
Hyperlipidemia		<.001
Yes	60/115 (52.2)	
No	42/174 (24.1)	
Chronic medication use		<.001
Yes	97/220 (44.1)	
No	5/69 (7.2)	
Demographic		
Education level, y		.14
>12	25/86 (29.1)	
≤12	77/202 (38.1)	
Living alone		.42
Yes	25/59 (42.4)	
No	77/229 (33.6)	
Smoker		.07
Yes	15/59 (25.4)	
No	87/229 (38.0)	
Sedentary lifestyle		.36
Yes	53/160 (33.1)	
No	49/128 (38.3)	
^a Percentage of patients in each group for whom BMI was documented.		

active. However, in our study population, BMI was documented in only 50.0% (39 of 78) of obese patients and in 38.9% (49 of 126) of overweight patients. In addition, obesity as a medical diagnosis was found in 24.4% (19 of 78) of obese patients. A diagnosis of obesity was observed significantly more often in obese patients with BMI documentation compared with obese patients without BMI documentation. Body mass index documentation may have heightened physicians' attention to their patients' weight. Moreover, physicians tend to formulate an obesity plan significantly more frequently in patients with an obesity diagnosis.¹⁷ Hence, BMI documentation that leads to identification of obesity could promote weight management within the family practice.

Our results suggest that predictors of BMI documentation are comorbid conditions such as diabetes and hypertension. This could be explained in part because management of these conditions includes maintenance of normal weight. A large study¹⁷ performed in the primary care setting also showed that physicians are more likely to manage obesity when patients have obesity-related disorders such as diabetes and obstructive sleep apnea. Other investigators have shown that weight counseling is given to obese patients who have at least 1 chronic condition.²⁶ Nevertheless, another study²⁷ in a hospital setting suggested that only 20% of obese patients discharged after myocardial infarction had obesity documented on their medical problem list. Again, the extreme importance of recognizing and managing obesity by healthcare providers is underscored and should be included in primary and secondary prevention efforts.

Obesity (BMI, ≥30.0) was found to be another predictor of BMI documentation in our study. This phenomenon was observed in 2 earlier studies.^{16,17} It seems that physicians sometimes rely on their patients' external appearance when making the diagnosis of obesity and tend to manage the condition more in heavier patients. However, primary prevention is especially important in overweight patients and could be facilitated through routine weight and height screening. By providing early intervention to those at risk for obesity, the process of weight gain could be stopped or even reversed before the development of obesity and its related

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disorders.²⁸ One study¹⁶ found an obesity diagnosis significantly more often among younger patients, and another study¹⁷ did not find that patient age affected BMI determination. In contrast, our study findings suggest that older age is an independent predictor of BMI documentation. The reason for this is unclear, and future research to determine the effect of age on obesity identification is needed.

Obesity is a risk factor for several disorders and is associated with a decrease in life expectancy that is comparable to the deleterious effects of smoking.¹³ Moreover, obesity results in substantial healthcare expenditures in developed countries and in developing countries.^{21,29} Given these circumstances, healthcare providers in general and physicians in particular should identify and manage the growing epidemic of obesity. However, consistent with previous findings, the results of our study suggest that few obese patients are recognized and managed accordingly. This study underscores the importance of BMI determination by family physicians as a crucial step in the identification and management of obesity.

There are several limitations to our study. First, we do not have direct evidence from our study population that links BMI determination with weight counseling by physicians. It is logical to assume that BMI determination is the first mandatory step in the recognition of obesity and increases the likelihood that obesity will be added to the medical problem list and possibly that it will be managed.^{17,30} Furthermore, it is plausible that physicians may have provided weight counseling without determining patients' BMI and documenting obesity in the medical record. Also, our study design did not assess waist circumference measurement by physicians, which is a well-established alternative to BMI determination. However, because the electronic medical record has a designated field for height, weight, and BMI documentation (as opposed to waist circumference measurement), it is unlikely that physicians would have favored it.

Second, our study population has a high burden of comorbidities, which might limit its generalizability to other populations. Because comorbidities were predictors of BMI determination in our study, it is possible that the rate of BMI determination in healthier populations would be even lower.

Third, this cross-sectional study was performed in 2004. Since then, obesity has received considerable public attention, which could have affected physicians' attitudes and

Table 3. Predictors of Body Mass Index (BMI) Documentation in the Multivariate Analyses^a

Demographic or Comorbid Condition	Odds Ratio (95% Confidence Interval)	P
Age ≥ 55 y	2.77 (1.39-5.49)	.004
BMI ≥ 30.0 , obesity ^b	2.04 (1.04-3.99)	.04
Medical condition		
Diabetes mellitus	4.35 (2.20-8.62)	<.001
Hypertension	3.20 (1.71-5.99)	<.001
Chronic medication use	3.44 (1.20-9.83)	.02

^aIncluded obesity, age 55 years or older, diabetes mellitus, hypertension, male sex, dyslipidemia, and chronic medication use.

^bCalculated as weight in kilograms divided by height in meters squared.

practice. The study should be extended to younger and healthier populations for confirmation and should be repeated in current morbid populations to assess possible trends in obesity diagnosis by physicians. In addition, a BMI electronic reminder integrated within patients' medical records could have a great effect on physicians' practice and should be assessed in future prospective trials.

CONCLUSIONS

Family physicians failed to determine BMI in most of their overweight and obese patients. Patients with obesity-related disorders were more likely to have a documentation of BMI. Also, obesity was found to be a predictor of BMI documentation, which suggests that patient appearance has an effect on the likelihood of weight assessment. Nevertheless, BMI screening is of utmost importance and should be incorporated into routine medical visits in family practice to facilitate primary and secondary prevention efforts. With obesity at epidemic levels worldwide, its identification and management by family physicians should be optimized.

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