



# Adding Obesity to the Problem List Increases the Rate of Providers Addressing Obesity

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**BACKGROUND AND OBJECTIVES:** Obesity is a common problem that increases risk of many other diseases, from heart disease to cancer. While counseling by a physician increases patient report of weight loss attempts and increased exercise, primary care physicians do not frequently address obesity. The objectives of this study were to determine how often obesity was included on the problem list and whether adding obesity to the problem list affected the rate at which it was addressed in future visits.

**METHODS:** We conducted an initial assessment, followed by a randomized controlled trial of patient records at a family medicine residency office. The intervention was the addition of obesity to the problem list. The measured outcome was whether or not obesity was listed as an encounter diagnosis in the following 5 months.

**RESULTS:** At baseline, 36.2% of obese patients had obesity on their problem list. A total of 55.5% of these patients had obesity addressed by a provider in the past year, compared with 5.1% of patients who did not have obesity on their problem list. In the 5 months following the intervention, 38 (14.7%) of the 258 patients in the intervention group had obesity addressed, compared with 11 (4.6%) of the 239 patients in the control group.

**CONCLUSIONS:** There is a significant relationship between the addition of obesity to the problem list and providers addressing obesity at future visits. This simple intervention could be accomplished automatically by the EMR and has the potential to change provider behavior.

(Fam Med 2013;45(9):629-33.)

Obesity is a complex, multifactorial condition of excess adipose tissue that causes illness for the individual and concern for the public. Obesity is generally defined by a body mass index (BMI)  $\geq 30$  (kg/m<sup>2</sup>), a ratio of weight to body surface area that is based on height.<sup>1</sup> It is a common problem

with a current prevalence of 35.7% of US adults.<sup>2</sup> The impact of obesity is significant as it increases the risk of hypertension, dyslipidemia, diabetes, obstructive sleep apnea, arthritis, non-alcoholic steatohepatitis, heart disease, stroke, and cancer, and it decreases life expectancy.<sup>3,4</sup>

There are guidelines for screening for obesity in the outpatient setting and addressing obesity when it is diagnosed. The US Preventive Services Task Force (USPSTF) recommends that physicians should screen all adults for obesity using BMI and refer patients with a BMI  $\geq 30$  for intensive behavioral therapy.<sup>5</sup> The American Academy of Family Physicians recommends that intensive counseling and behavioral interventions should be offered to adults diagnosed with obesity.<sup>4</sup> Studies on physician counseling have shown that patients who were advised to lose weight were more likely to report attempting to lose weight and that sedentary patients who received brief physical activity counseling increased self-reported walking times and objective physical activity levels.<sup>6,7</sup>

Despite this, physicians do not regularly address obesity. National survey results show that 58% of primary care physicians perform no weight-loss counseling at all, and 8.9% of physicians are performing 52% of all counseling.<sup>8</sup> While there are many reasons that physicians may not address obesity, there have been efforts to bring about change.

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One technique used to increase the rate of providers addressing obesity is to present BMI with the vital signs. A retrospective evaluation of physician documentation before and after the implementation of an electronic medical record (EMR) that calculated and displayed the BMI showed an increase in physician documentation of obesity in the progress note or problem list and increased physician management of obesity by documentation of counseling or referral.<sup>9</sup> While these results were not replicated in a randomized controlled trial of including BMI with vital signs, this study may not have had adequate power to achieve significance.<sup>10</sup>

A different approach was taken by McArator, who studied physician behaviors to identify factors associated with addressing obesity. In this study, physicians addressed obesity during the current visit for 92.9% of the patients for whom the physician recorded obesity on the problem list but only 56.6% of patients who were identified as obese when they did not add obesity on the problem list during that visit.<sup>11</sup> The problem list is a list of the patient's chronic or active medical problems, generally displayed at the front of the chart or on the first screen of an EMR, for the purpose of organizing and guiding treatment across time and multiple providers.<sup>12</sup>

Based on the function of the problem list and the results of McArator, we hypothesized that adding obesity to the problem list would make providers more likely to address obesity in future visits.

## Methods

### *Subjects and Setting*

Data came from patient records at an urban family medicine residency office. There were 51 providers seeing patients in this office: 39 residents, nine faculty members, and three physician assistants.

The initial assessment included all records of patients who had a visit in the previous year, were between the ages of 18 and 64 years, and had

a BMI of  $\geq 30$ . The interventional study included records of patients if they met the previous criteria, had at least one appointment during the 5-month follow-up period, and were not pregnant at the time of the intervention.

This study was approved by the institutional review board of the study site.

### *Study Design*

In the initial assessment, the research team performed a chart review to determine the number of obese patients, how many of their charts included obesity on the problem list, and if there was a relationship between having obesity on the problem list and having it addressed during the past year. Addressing obesity was defined as obesity (*International Classification of Diseases, Ninth Edition* [ICD-9] codes 278.0 or 278.00) or a related diagnosis (overweight [278.02], morbid obesity [278.01], screening for obesity [V77.8], BMI 25–29 [V85.2], BMI 30–39 [V85.3], or BMI 40 and over [V85.4]) listed on the encounter diagnosis form for an office visit. The encounter diagnosis form was used by the physician to indicate the diagnoses that were addressed during the visit.

In the interventional study, charts of obese patients who did not have obesity on their problem lists, had not had obesity addressed, and were not pregnant were randomly assigned to an intervention or control group using Minitab (version 16, Minitab, Inc, State College, PA) statistical analysis software. The research team manually added obesity to the problem list of those 422 patients randomized to receive the intervention. For the 421 patients randomized to the control group, no changes were made to their health record.

Five months after the intervention, we evaluated the charts of patients who had a follow-up appointment to determine the number of patients from each group who had obesity addressed at any

visit. This time period was chosen to fit the timeframe of the PI during her final year of residency. While we initially included patients of all 51 providers, we realized that three providers were aware of the study, the two authors and the medical director, and this could bias the results. We thus excluded patients who were seen by these three providers from our analysis (although the pattern of results was unchanged when they were included).

### *Analysis*

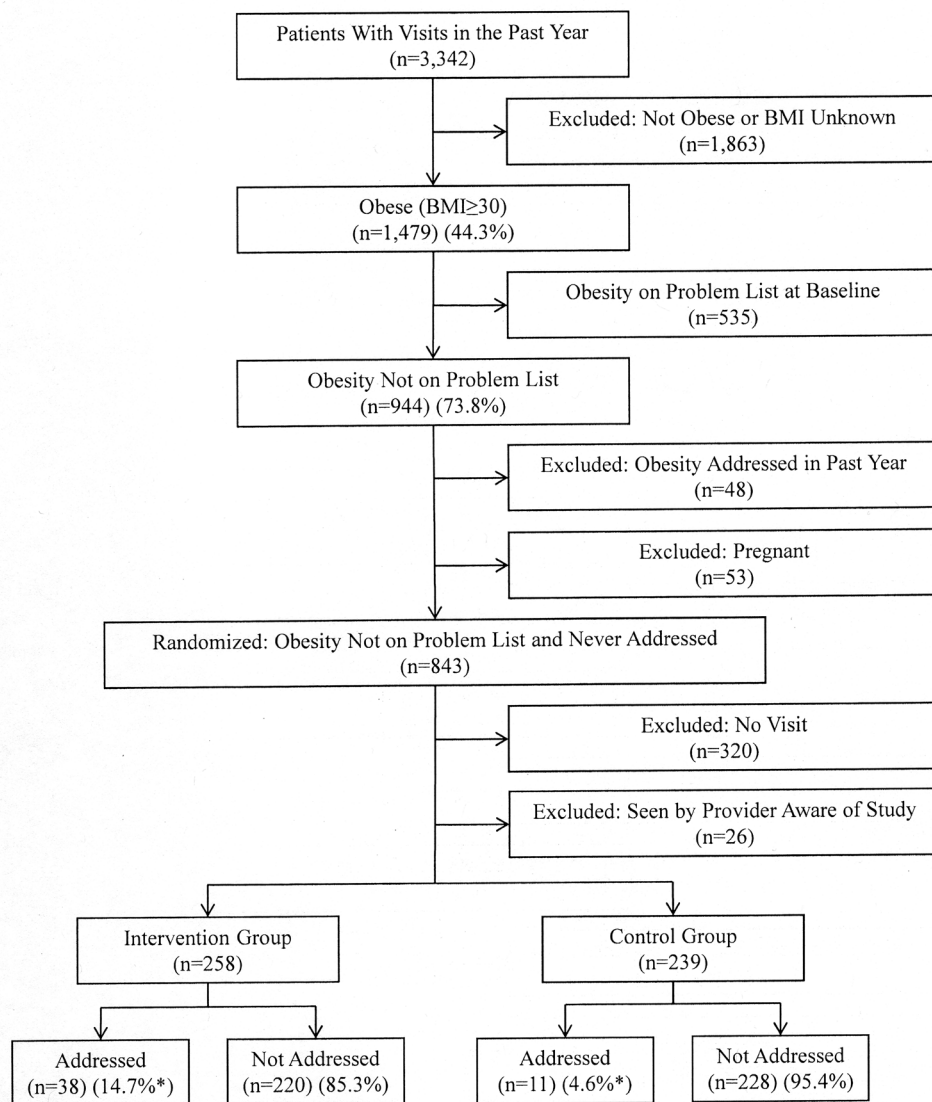
Data were collected from the office EMR. Results were analyzed using cross tabulation chi-square analysis for nominal values or Student's *t* test for interval values within Minitab. An *a priori* power analysis was conducted estimating that a total of 610 patients would need encounters in the follow-up period to achieve a power of 80% to identify a 10% difference between groups, with  $P < .05$ .

## Results

The initial analysis revealed that 3,342 patients had an office visit during the year preceding the intervention. A total of 1,479 (44.3%) of these patients had obesity based on BMI. Of these patients, 535 (36.2%) had obesity on their problem list. A total of 297 (55.5%) of these 535 patients had obesity documented as an encounter diagnosis by a provider in the past year, compared with 48 (5.1%) of the 944 patients who did not have obesity on their problem list ( $P < .001$ ) (Figure 1).

After eliminating the 48 patients who had obesity addressed in the past year, and 53 patients who were pregnant, there were 843 patients who were randomized to have obesity placed on their problem list. A total of 320 patients did not have an appointment during the 5-month follow-up period, and 26 were seen by a provider who was aware of the study. Thus, 497 (59%) were seen in the office during the next 5 months by a provider who was unaware of the study, including 258 in

Figure 1: Study Protocol and Outcomes

\* $P < .001$ 

the intervention group and 239 in the control group. The 346 patients who were eliminated from the study were significantly younger than the patients who were included in the study (47.0 years old compared to 41.5 years old,  $P < .001$ ). There were no other significant differences in demographic variables or BMI between these groups.

There were no significant differences between the intervention and control groups in number of patients who had an appointment, number of appointments they had, sex, race,

age, or average BMI (Table 1). During the 5-month follow-up, obesity was addressed for 38 of 258 (14.7%) patients in the intervention group, compared with 11 of 239 (4.6%) patients in the control group ( $P < .001$ ).

## Discussion

### Clinical Implications

The results of this study show a significant relationship between the addition of obesity to the problem list and providers addressing obesity at future visits. Obesity has severe clinical implications for patients and is

increasing in prevalence. It is important that primary care physicians address this problem, but physicians do not frequently do so. However, the results of this study suggest that physician behavior may be modifiable.

The major value of this study is the simplicity of the intervention. When a BMI  $\geq 30$  is noted, any medical staff could add obesity to the problem list of a paper chart. Further, as the use of EMR systems increases, the computer system could present staff with the option of

**Table 1: Participant Characteristics**

Variable	Intervention	Control	P Value
Number that had $\geq 1$ office visit	258	239	.192
Average number of visits: mean(SD)	2.5 (1.8)	2.5 (1.6)	.892
Sex			.771
Female	187 (72.5%)	176 (73.6%)	
Male	71 (27.5%)	63 (26.4%)	
Race			.319
African American	30 (11.6%)	39 (16.3%)	
Caucasian	212 (82.2%)	186 (77.8%)	
Other/unknown	16 (6.2%)	14 (5.9%)	
Age: Mean (SD)	48.0 (16.9)	46.0 (16.4)	.191
BMI: Mean (SD)	34.9 (4.8)	34.3 (4.4)	.123

SD—standard deviation

adding obesity to the problem list or could automatically make the addition. This is a relatively simple task for a programmer that could change the way that providers address obesity.

#### Limitations

One limitation of the study is the use of the encounter form diagnosis as a marker for addressing obesity. Diagnostic coding has been demonstrated to be predictive of addressing respiratory infections and urinary tract infections<sup>13,14</sup> but has yet to be validated for obesity. Additionally, the encounter form does not provide information as to how the provider addressed obesity, which could include counseling, medication, referral, or screening for related illness, such as diabetes.

Although the study design attempted to limit bias by not informing providers that there was a study in progress, three physicians were aware of the study, two of the authors and the medical director. The patients seen by these providers were eliminated from the study due to possible bias (Figure 1).

Additionally, the number of patients who had appointments during the follow-up period was less than

the number set in our *a priori* power calculation. The fact that a significant result was found despite this suggests that the true effect may be stronger than what was observed.

#### Future Research

While guidelines state that physicians should be routinely addressing obesity, and this study suggests one way to increase the rate of physicians doing so, the best way to go about addressing obesity is not yet known. Options for treatment may include counseling in the primary care setting regarding self-management and commercial weight-loss programs, medications, referral for specialized counseling, and surgery.<sup>3,4</sup> The primary care community needs additional research on the long-term patient-centered outcomes of obesity treatment. Further, while the results of this study show an increase in providers addressing obesity, the rates are still very low and far from the recommendations of the USPSTF.

Additional questions arise regarding the impact of this intervention on patients. In some practices patients may view their problem list, either on a visit summary or through an online portal. If obesity is added to the problem list, the patient could

become aware of this. While this may have a positive outcome in patient motivation to lose weight or desire to discuss obesity with the provider, it could also have unintended, negative psychological or social consequences.

The observation data shows a much higher rate of providers addressing obesity among those patients with obesity documented on the problem list at baseline (44.3%) than we found in the intervention group (14.7%). The length of follow-up may have had some impact on this as the observation data was collected over 12 months, while the prospective data was only collected over 5 months. However, it also suggests that there is a difference between those who already had obesity on their problem list and those who did not.

This study was conducted in a single site with a variety of type of providers. For greater generalizability of these findings, it would be beneficial to conduct similar studies within multiple study sites. It would also be important to evaluate if the effect is greater for certain types of providers, such as residents compared with attending physicians.

## Conclusions

In summary, this study shows a significant association between the addition of obesity to the problem list and an increased rate of providers including obesity as an encounter diagnosis, which may be a marker for addressing obesity. This has important implications in primary care, as obesity is a serious problem that may be impacted by physicians but only if they address it with patients. The impetus to change provider behavior may include a relatively small change in documentation.

**ACKNOWLEDGMENTS:** This study was presented as a poster at the 2012 Society of Teachers of Family Medicine Annual Spring Conference in Seattle.

We thank Dr Margaret Nepps of Lancaster General Hospital for her assistance in developing the experimental question and Drs Howard Rabinowitz, Randa Sifri, and Marianna LaNoue of Thomas Jefferson University for reviewing the manuscript.

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