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The Effect of BMI Advising on Weight Loss

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Abstract

Background: 33.8% of Americans are obese, and this is a growing number. However, a number of obese persons do not perceive themselves to be obese and many more under-report their weight. Furthermore, an even larger number of obese persons’ weight is not acknowledged by their physician, nor are they given a diagnosis of obesity. This review examines the effects of the simple tool of BMI on weight loss.

Method: An exhaustive search of available medical literature was performed using Medline (OVID), CINAHL, EBMRmultifile, and Web of Science using obesity, perception, and weight loss as key words. BMI, counseling, and physician advice were then added to refine the search. A modified form of the GRADE tool was used to evaluate the articles.

Results: The search resulted in 243 articles. After duplicates and unrelated articles were excluded, six articles that meet the search criteria remained and were included in the review. The intervention was physician acknowledgement of weight status based on BMI. The primary outcome was report of weight loss. Overall, those patients who recalled a weight discussion with their physician were between 138% and 171% more likely to report weight loss, as compared to those who did not recall a weight discussion. The quality of three studies was moderate, and the other three studies was low.

Conclusion: Use of BMI advice is fast. It appears to have a positive effect on patients’ attempts to lose weight, although the quality of the evidence is moderate to low. More stringent studies that remove confounding variables and biases should be conducted. In the meantime, however, patients should be made aware of and educated about BMI.

Keywords: BMI, counseling, obesity, perception, physician advice, weight loss

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The Effect of BMI Advising on Weight Loss

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School of Physician Assistant Studies

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Biography

[Information redacted for privacy]
Abstract

**Background:** 33.8% of Americans are obese, and this is a growing number. However, a number of obese persons do not perceive themselves to be obese and many more under-report their weight. Furthermore, an even larger number of obese persons’ weight is not acknowledged by their physician, nor are they given a diagnosis of obesity. This review examines the effects of the simple tool of BMI on weight loss.

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**Conclusion:** Use of BMI advice is fast. It appears to have a positive effect on patients’ attempts to lose weight, although the quality of the evidence is moderate to low. More stringent studies that remove confounding variables and biases should be conducted. In the meantime, however, patients should be made aware of and educated about BMI.

**Keywords:** BMI, counseling, obesity, perception, physician advice, weight loss
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List of Abbreviations

BMI ............................................................... Body Mass Index
GRADE .......... Grading of Recommendations Assessment, Development and Evaluation
OR ................................................................. Odds Ratio
CI ................................................................. Confidence Interval
NHANES .................................................. National Health and Nutrition Examination Survey
BRFSS ....................................................... Behavioral Risk Factor Surveillance System
BACKGROUND

Obesity is a national epidemic: a striking 33.8% of Americans are obese. Obesity is defined as BMI ≥ 30, and overweight as BMI ≥ 25, where BMI is measured by weight, in kilograms, divided by the square of height, in meters. BMI is the most common screening test for obesity; it is easy to measure and highly reliable. The effects of being overweight or obese are numerous. They include diminished life expectancy, hypertension, dyslipidemia, diabetes mellitus, coronary heart disease, congestive heart failure, stroke, gallstones, osteoarthritis, sleep apnea, respiratory impairment, cancer (including colon, breast, endometrial, and gallbladder), problems with reproductive health, diminished mobility, and social stigmatization. To give a comparison, “obesity appears to have a stronger association with the occurrence of chronic medical conditions, reduced health-related quality of life, and increased health care and medication spending than smoking or problem drinking has.” Obesity is comparable to aging twenty years. Still worse is that there are more obese persons than those that are heavy drinkers or daily smokers.

Compounded with the ill effects of obesity, many patients have inaccurate perceptions of their own weight. When asked to state their weight category (i.e. underweight, average weight, overweight), patients are often wrong. In one study, 40% of overweight and 12.5% of obese patients did not see themselves as overweight. Among adolescents, 46.2% do not perceive themselves to be overweight. A study looking at reliability and validity of self-reported height and weight found that participants over-
reported their height on average by 2.7 inches, and under-reported their weight by 3.5 pounds. In another study,\textsuperscript{9} 25.7\% of obese men and 43.8\% of obese women underestimated their self-reported BMI measures. “Females and heavier respondents showed more BMI under-reporting than others.”\textsuperscript{9} While it may not be surprising that females tend to under-report, it is striking that heavier respondents are more likely to do so. This is a group that needs to be targeted for improvement in health and quality of life. “Underestimation of obesity status may exacerbate risk for negative health consequences because of a failure to recognize and respond to excess weight.”\textsuperscript{10}

What further exacerbates the adverse effects of obesity is that obesity can become a cycle. When a person is surrounded by people who are obese or overweight, particularly a child among his parents, he may set that as the standard, and be obese or overweight himself, not ‘perceiving’ what is a normal or healthy weight. The awareness of healthy weight, measured by BMI, needs to be increased. If people do not perceive themselves as overweight, they will not do what they need to in order to lose weight and be healthier.

The physician can be the catalyst to break the cycle and enlighten patients as to their obesity. But, physicians are not telling their overweight or obese patients that they are overweight. Among overweight patients by self-report, between 55\% and 85\% are not told they are overweight or should lose weight. Worse still, between 34\% and as many as 60\% of obese patients are not told that they are obese or should lose weight.\textsuperscript{11-15} More significant then physicians not telling their obese patients that they are obese is that physicians rarely give diagnoses of obesity; for example, one study documented only 14\% of patients with a BMI of 30 or higher had such a diagnosis.\textsuperscript{16,17}
In addition to the goal to “reduce the proportion of adults who are obese” as one objective of Healthy People 2020, another objective is to “increase the proportion of primary care physicians who regularly assess BMI in their adult patients”. In 2008, fewer than 50% of primary care physicians regularly assessed BMI in their adult and pediatric patients. To help prevent obesity, children especially need to be targeted.

Weight is a sensitive issue. This may be why it is often not discussed. Some say that the patients already know that they are overweight. Still, the epidemic of obesity is not going away. What is promising is that one study found that “more frequent contact with one's primary care physician was associated with more realistic [weight loss] goals.” Another study found that patients who received physician advice to quit smoking, eat less fat, or get more exercise were more likely to report trying to do so.

For many indicators of medicine, medical providers inform their patients of normal ranges. When asked what is normal blood pressure, many patients know it is “120/80”. Patients often know these numbers for blood glucose readings, hemoglobin A1C, even cholesterol levels. Why not inform patients of the normal ranges of BMI? Beyond measuring height and weight and then calculating BMI, a discussion needs to follow where the physician informs the patient of their BMI status, what their individual ideal healthy weight is, and tips on how to get there.

What affect, if any, will physician acknowledgement of patients’ weight status and advice directed towards BMI have on patients’ weight loss? Can a relatively simple and short discussion have an impact on this national epidemic?
METHOD

An exhaustive literature search was conducted using Medscience (OVID), CINAHL, EBMRmultifile, and Web of Science databases. The initial search terms were obesity, perception, and weight loss, with BMI, counseling, and physician advice later added to refine the search. The articles found were screened for duplicates and inclusion/exclusion criteria. The final studies eligible for inclusion were combined with those found through the bibliographies. A modified form of the GRADE tool was used to evaluate the studies and assess the quality of evidence, by looking at strengths, limitations, risk of bias, and validity.

Studies addressing physicians’ advising of obese and overweight patients and their weight loss were examined. Inclusion criteria included: 1) The study looked at physician weight advice to overweight and obese individuals in a primary care setting. 2) The study contained BMI information. 3) The outcome was weight loss, as a result of exercise and/or restricting calories. 4) The study was conducted in an industrialized country. Exclusion criteria included: 1) Weight counseling that was for underweight individuals. 2) Studies that had an outcome of multiple chronic diseases as it related to excess weight as a risk factor. 3) Forms of weight loss other than exercise or caloric restriction (such as bariatric surgery). 4) Non-industrialized countries. 5) Studies collecting data on exercise for its effects on other outcomes than weight loss (for example, exercise for treatment of sedentary life). 6) Comparison of differing characteristics, such as race or gender, of those that receive weight advice from physicians.
RESULTS

The search results in 243 articles, of which six studies met the inclusion criteria and were included in the analysis. No randomized control studies, cohort studies, or case control studies were found; all six studies included were cross-sectional studies. Table 1 lists the ORs and 95% CIs for each study. It also shows characteristics and quality assessments of the studies. Figure 1 is a forest plot displaying the outcome data.

Post et al\textsuperscript{11} used data from the National Health and Nutrition Examination Survey (NHANES) from the years 2005-2008 and included 5474 participants. This is a national survey made to represent the non-institutionalized US population and includes a questionnaire and a physical exam. The study participants were age 20-64. All had a BMI $\geq 25$, and 52% had a BMI $\geq 30$. The height and weight used to calculate their BMIs was measured by research workers. The interventional question was “Has a physician or other health professional ever told you that you were overweight?” The outcome measured was weight loss attempts: “During the past 12 months, have you tried to lose weight?” The potential responses were “yes” or “no”. The OR is 1.5235 (95% CI: 1.4079-1.6485).\textsuperscript{11}

Kant and Miner\textsuperscript{12} also used data from the NHANES, from the years 1999-2002, but they focused on 716 nonpregnant, nonlactating adolescents age 16-19. Because most of them were not adults, a substitution for the standard BMI definitions was used, and was measured by researchers. All had a BMI-for-age of $\geq 85^{th}$ percentile (considered at-risk), and $\geq 95$th percentile was considered overweight. The intervention was “Has a doctor or health professional told you that you were overweight?” The outcome measured was attempted weight loss. The OR is 1.4651 (95% CI: 1.3009-1.7295).\textsuperscript{12}
Huang et al\textsuperscript{17} took data from 210 structured exit interviews in 2001-2002 at two outpatient clinics in Louisiana, which occurred immediately after a clinic visit with a physician. These patients were older than 18 years old and all had a BMI $\geq 25$, which was measured by healthcare workers. The intervention was patients’ recall of weight loss counseling from the physician. Outcome was “Do you want to lose weight?” This futuristic outcome was chosen (rather than a past or current outcome, such as previously attempted or currently attempting weight loss) as it followed the physician visit, and a possible cause-and-effect relationship could be investigated. The OR is 1.3880 (95\% CI: 1.1234-1.7150).\textsuperscript{17}

Galuska and colleagues\textsuperscript{13} used data from the Behavioral Risk Factor Surveillance System (BRFSS) survey, from all 50 states and the District of Columbia, from the year 1996. The BRFSS is an ongoing random-digit telephone survey. The participants were 12 835 noninstitutionalized, non-pregnant adults older than 18 years old, and had visited their physician for a routine checkup within the previous 12 months. The intervention was measured by the answer to the question “In the past 12 months, has a doctor, nurse, or other health professional given you advice about your weight?” The outcome was “Are you now trying to lose weight?” All answers were self-reported, as was BMI. The OR is 1.3802 (95\% CI: 1.3477-1.4135).\textsuperscript{13}

Sciamanna and colleagues\textsuperscript{22} also used the BRFSS survey, looking at 10 states (those that had included additional modules of survey questions about hypertension and cholesterol awareness). There were 10 187 participants, who were greater than 18 years old. The same intervention as the previous study was used: “In the past 12 months, has a doctor, nurse, or other health professional given you advice about your weight?” Another
question asked of the participants was if they were currently trying to lose weight, and the outcome was measured according to the response to that question. These answers, as well as BMI, were self-reported. The OR is 1.4000 (95% CI: 1.3428-1.4597).\textsuperscript{18}

Nawaz and colleagues\textsuperscript{15} again used data from the BRFSS survey, but only looked at the 1994 Connecticut data. The 1254 participants were older than 18 years old and self-reported a routine checkup during the past year, and supplied self-reported BMI information. Intervention was measured by “if, in the past 12 months, a doctor, nurse, or other health care professional had advised them to lose weight, to gain weight, or to maintain weight, or had offered no weight-related advice”. Outcome was measured by whether they were currently trying to lose weight. The OR is 1.7115 (95% CI: 1.4821-1.9765).\textsuperscript{15}

**DISCUSSION**

Overall, a much higher percentage of patients who were counseled on weight, versus those that were not, reported that they had tried to lose weight. The ORs ranged from 1.3802 to 1.7115, as can be seen in Table 1. What can be confidently said is that those who *recalled* receiving weight loss advice were more likely to *report* trying to lose weight.\textsuperscript{17,22} However, because of the flaws in the methodologies of the studies, discussed below, it is impossible to decipher if this is a cause-and-effect relationship or a correlation. Key weaknesses include recall bias and that attempts to lose weight were self-reported. It is possible that “respondents might just have wanted to seem adherent to their physicians’ advice.”\textsuperscript{22}

Other findings include that between 55% and 85% of overweight patients and
between 34% and 60% of obese patients were *not* told that they were either overweight or obese and should lose weight.\textsuperscript{11-15} As uncommon as such counseling is, it was found that advice is more commonly given to those who are obese, rather than to those who are overweight. It is also given more commonly to those who already have obesity-related comorbidities, rather than for prevention\textsuperscript{13,22} Moreover, it was found that advice to lose weight seemed to have its greatest impact on those who are overweight, versus obese.\textsuperscript{22} It is the people who are overweight based on BMI that are more likely to take positively the advice and lose weight, compared to those who are obese. BMI advice is being given less often to those overweight individuals, who are at risk for becoming obese, to stop the trends and cycles. But it is this group, the overweight individuals, that benefits most from such advice and counseling.

As for the overall quality of the studies, the positive characteristics include that the results are universal among all studies analyzed. The choice of participants was for the most part comprehensive, and the results can be applied to patient care. However, the method of data collection (self-report) has major limitations. The negative characteristics are that the data was not analyzed appropriately. The chosen methods distorted the interpretation of observations. There was no triangulation, which is often used in qualitative studies such as these to overcome weakness and intrinsic bias. This involves validation of data through cross verification by combining several research methodologies, and was notably lacking in these studies.

The most profound of the many limitations of the studies was the self-reporting from patients. The first example of this self-reporting flaw is in regards to patient BMI measurements. Only Post et al\textsuperscript{11}, Kant and Miner\textsuperscript{12}, and Huang et al\textsuperscript{17} used healthcare
worker-measured height and weight to calculate BMI. The remaining three studies used self-reported measurements. Studies have shown that people can grossly under-report their weight, and therefore BMI.\textsuperscript{10,11}

A second example of self-reporting was that, in all six studies, patients’ reports of attempts to lose weight were unspecific and entirely self-reported. Without valid proof of weight measurement and other data collection of caloric intake, duration and type of exercise, et cetera, differential reporting errors due to perceived social desirability of certain responses cannot be ruled out. The cause-and-effect relationship between advising and weight loss efforts is uncertain.

A third flaw regarding self-reporting was exclusive patient reliability of clinical encounters. Surely, recall bias is involved at some level. Patient and physicians may have different definitions of counseling. Without report from the physician also, only the patient’s one-sided story is used. Could the physician’s intent of counseling not be perceived by the patient, who reported the physician’s counseling?

A second major limitation is, that all of the studies except Huang et al\textsuperscript{17} used not just physicians, but also nurses and “other health care providers”. Without knowing which advice came from physicians, versus other health care providers, it is impossible to evaluate the effect of physician BMI counseling on weight loss.

A third large limitation is that it is not possible to validate the content, extent, or variation, of the encounter between the physicians and patients. Was it the physician or the patient that initiated the conversation? “Subjects concerned about their weight might have sought advice from their physicians.”\textsuperscript{17} If this is the case, then there is some bias involved: the patient may have increased readiness to lose weight himself and it is
difficult to separate these desires from the strict influence of a physician’s advice about BMI. Beyond a patient’s recall of whether they were informed of their BMI, it is unknown what further suggestions, if any, took place. A long discussion involving useful methods of exercise and healthy eating would likely spawn more weight loss. Also, among the patients that has misperceptions of their own body weight and category, are they more likely to “not hear” what their physician is telling them? In all of the six included studies, no counter-reference from the physicians was asked. Additionally, the type of visit where a patient did or did not recall physician advice from is not known. An ideal situation is a primary care setting where the physician is discussing preventative medicine.

Fourthly, labeling of overweight based on BMI can be wrong. However, it is one of the better methods for assessing weight status. It is closely correlated with adult body fat.3

A smaller, but still valid, fifth limitation is that weight change may have occurred between the clinical encounter and completion of the survey. This mainly affects five of the six studies.11,12,14,15,22 In the three studies done by Galuska and colleagues14, Sciamanna and colleagues22, and Nawaz and colleagues15, participants were asked, retrospectively, “In the past 12 months, has a doctor, nurse, or other health professional given you advice about your weight?”14,15,22 Post et al11 and Kant and Miner12 simply asked participants “Has a doctor or health professional told you that you were overweight?” There were no limit to the time reference. Compared to 12 months prior, or an indefinite amount of time prior, when a person was presumably advised by their physician, their weight could have potentially changed substantially and their
currently reported BMI could muddle the results.

Rates of reporting advice to lose weight are low. But substantially more people who are advised to lose weight, versus those that are not, do report attempts to lose weight. BMI advising does appear to be effective, but there is room for improvement. Those who are at-risk, people who are overweight (BMI: 25-29), are receiving just a fraction of an already minuscule amount of advice.

CONCLUSION

It appears physicians provide little BMI counseling to their patients, especially to those who are overweight and obese. Barriers to counseling may include lack of: time, reimbursement, training, staff support, comprehensive obesity management resources (e.g. a weight loss clinic), use of dietitians, perceived success rate, perceived ability to change/influence patient behavior, belief in the value of preventive counseling, and knowledge of best clinical practices.17,23

Physicians can make a difference. Physician advice on patient behavior is a catalyst for change and can help lead to sustained behavioral change.21 Results from the included studies show that patients who were made more aware of their weight are more likely to attempt to lose weight. This demonstrates the importance of including BMI screening and weight counseling in each primary care preventative medicine visit. However, there are also many limitations in the studies involving this subject. Further research needs to be done to validate these cross-sectional studies. A better study design to validate the results is needed, such as a randomized control trial where the experiment group receives pre-set advice from their physician, and the control group does
not. Regular weigh-ins could occur to track weight change. As many confounding
variables as possible would be removed, so the pure effects of physician BMI advising
can be seen in regards to weight loss.
References


Table 1: Characteristics of Studies and Summary of Findings

<table>
<thead>
<tr>
<th>Study</th>
<th>Quality Assessment</th>
<th>Summary of Findings</th>
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**Characteristics of Studies**

- **Study**: Details of each study are listed here.
- **Quality Assessment**: Criteria used to assess study quality.
- **Summary of Findings**: Key findings or outcomes from each study.
Figure 1: Forest Plot

Effect of BMI Advice on Attempted Weight Loss

OR (95% CI)
1. 1.52 (1.41-1.65)11
2. 1.47 (1.30-1.73)12
3. 1.39 (1.12-1.72)17
4. 1.38 (1.35-1.41)14
5. 1.40 (1.34-1.46)22
6. 1.71 (1.48-1.98)15