Research Article

Improving Awareness of Patients with Obesity and its Healthcare Implications

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ABSTRACT

Objective: The purpose of this quality improvement initiative was to improve patients' awareness and understanding of body mass index (BMI) and its healthcare implications. Background: Obesity has reached epidemic levels nationwide and is tied with smoking as the leading cause of preventable death. The Division of General Internal Medicine (GIM) at Mayo Clinic has approximately 3,680 patient visits monthly. Over 50% of these visits are with patients with a BMI >25 (overweight-obese). However, only 20% of these visits had documentation of discussion regarding obesity/BMI. As such, a significant quality gap exists in terms of obesity awareness, discussion, and implementation of treatment options. Given that awareness is the pivotal first step in reducing obesity-related risks factors, we utilized quality methods and metrics in order to investigate the etiologies for this vast awareness gap, hypothesized and implemented a potential intervention, and reassessed for improvement.

Design and methods: This study was designed as quality improvement initiative. A root cause analysis (5-Whys) was performed to determine why obesity was not being addressed during physician visits. Based on this analysis, we hypothesized that a brief intervention of a physician-led discussion would increase patients' awareness and understanding of BMI.

A pre- and post-intervention survey tool was utilized to measure baseline and subsequent understanding respectively. Participants included patients seen within GIM at Mayo Clinic.

Results: A total of 70 patients completed the physician-led discussion along with the pre- and post-intervention surveys. The mean age of the cohort was 58.82 $\pm$ 12.69 years, with 45 (65%) male and 25 (35%) female participants. The mean intervention time of the physician-led discussion was 3 minutes. The brief intervention led to statistically significant improvements in patient awareness and understanding of BMI, ability to calculate BMI, knowledge of BMI-associated health risks, and awareness of an online resource tool. Furthermore, as result of this intervention, 84% of patients stated that they were more motivated to lose weight.

Conclusion: This quality initiative demonstrates various clinically orientated applications of quality metrics and tools. In summary, when physicians actively engage patients in a discussion about BMI and weight loss, not only do patients become better informed about their personal health and associated risk factors, but they also become more motivated to lose weight.

Key Words: Obesity, awareness, quality, BMI

Background

Obesity has reached epidemic levels nationwide. A census done in 2009-2010 revealed that more than 78 million adults in the United States were obese.[1] Currently, obesity is tied with smoking as the leading cause of preventable death, nationwide.[2-5] A number of co-morbidities such as type 2 diabetes mellitus, sleep apnea, stroke, gallbladder disease, osteoarthritis, cardiovascular disease, and different types of cancers are associated with obesity.[6] Most notably, obesity is a preventable disease, if appropriate interventions are taken.

Dietary measures, exercise, and physical activity are the first line treatments for obesity.[7] Various pharmacologic agents such as phentermine, orlistat, phentermine/topiramate combination, and lorcaserin are being used clinically with variable success.[8-10] Surgical procedures such as Roux-en-Y gastric bypass, laparoscopic adjustable gastric banding, sleeve gastrectomy, and biliopancreatic diversion with duodenal switch are usually reserved for extreme cases of obesity when all other measures fail.[11-13] These surgical interventions, however, are associated with numerous potential adverse complications, including surgical complications, nutritional status changes, bowel pattern alterations, vitamin deficiencies, and bone health decline.[14]

Physicians play a key role in the treatment of obesity. It is vital to note that the treatment of obesity is not possible without proper awareness and diagnosis. Unfortunately, this diagnosis is not always being made in the physician's office. A few factors that might contribute to the difficulties in diagnosis are lack of time during patient encounters, other co-morbidities requiring urgent attention, lack of awareness of patients' body mass index (BMI), or fear of offending patients. These factors lead to under-diagnosing obesity and hence not initiating proper treatment. Awareness among physicians and patients is the pivotal first step in diagnosing and reducing obesity-related risks factors.[15-18] Many studies have reported that patients are

not aware of their BMI and hence it is difficult to counsel them about lifestyle modifications and diet. [19,20] Interestingly, there is a paucity of studies in the literature that discuss the importance of identifying BMI in patients and increasing their awareness. Utilizing quality metrics and tools, we explored the etiologies for this awareness gap, hypothesized and implemented potential interventions, and reassessed for improvements. Our aim was to improve patients' understanding of BMI (including definition, calculation, clinical relevance, associated risk factors, and healthcare implications).

Materials and Methods

The Division of General Internal Medicine (GIM) at Mayo Clinic has approximately 3,680 patient appointments per month. These patients are seen by over 100 clinicians. Over 50% of these visits are with patients with a BMI > 25. One of the main concerns during these visits is how well we address obesity in patients. Initial reports generated electronically revealed that only 20% of these visits had documentation of discussion regarding weight/BMI. As such, a significant quality gap exists between the presence of obesity and the actual diagnosing and discussion of obesity with patients. A root cause analysis (5-Whys) was performed to determine why obesity was not being addressed during the general medical examination. We approached multiple physicians in the Division of General Internal Medicine at Mayo clinic and asked a series of questions to determine, in their opinion, the reasons why BMI was not addressed at patient visits. The following theme emerged:

- 1. Why don't patients know about their BMI?
o Response: Because they do not care about BMI.
- 2. Why don't patients care about their BMI?
o Response: Because they do not know that BMI is clinically important.
- 3. Why don't they know that BMI is clinically important?
o Response: Knowledge gap; nobody is telling them of BMI's importance.
- 4. Why are providers not discussing the importance of BMI?
o Response: Because providers are addressing other issues for which patients come to the clinic. Obesity and BMI get sidelined in lieu of other patient-directed concerns.
- 5. Why does obesity/BMI get sidelined?
o Response: Most patients are not experiencing direct symptoms from their obesity/BMI, as compared to other issues for which they are seeking medical care.

Based on this root cause analysis, we hypothesized that a potential intervention would be to have a physician-led discussion about BMI at the general medical exam visit. We developed a survey tool, to be implemented by participating GIM physicians, which would directly address the awareness and clinical importance of BMI. A baseline pre-intervention survey (please see appendix) was administered to patients to measure their baseline knowledge and awareness of BMIFollowing the pre-intervention survey, the intervention (physician-led discussion) took place, engaging the patient in a conversation about BMI, while utilizing the National Institute of Health (NIH) BMI calculator.[21] Subsequently, a post-intervention survey (same as pre-intervention) was administered to assess for any improvement in knowledge and awareness of BMI.

Only surveys with all data completed were used for statistical analysis. The nominal data before and after the intervention were compared using McNemar's test for paired nominal data. All categorical data were reported as mean and standard deviation. All statistical analysis was performed using JMP, version 10 (SAS, Inc.).

Results

A total of 70 patients participated in the study. The providers that participated in the study reported that it took 3 minutes on average (range 2 – 5 minutes) to implement the intervention and engage in a meaningful discussion with patients about obesity and BMI. The mean age of the cohort was 58.82 ± 12.69 years and ranged from 28 – 95 years. There were 45 (65%) males and 25 (35%) females. Prior to the intervention 62 (88.6%) patients had heard of the term BMI, while 70 (100%) had heard of the term BMI after the intervention. In the pre-intervention period, 40 (57.1%) knew what BMI meant or represented, while 67 (96 %) knew what BMI meant or represented in the post-intervention phase. A total of 13 (18.6%) patients knew how to calculate BMI in the pre-intervention phase, while 67 (96 %) knew how to calculate BMI in the post-intervention phase. A total of 11 (15.7%) patients knew their current BMI in the pre-intervention phase, while 67 (96 %) knew their current BMI in the post-intervention phase. A total of 46 (65.7%) patients were aware of the health risks associated with BMI in the pre-intervention phase, while 67 (96 %) patients were aware of the health risks in the post-intervention phase. Only 12 (17.1%) patients were aware of any online resources to calculate BMI in the pre-intervention phase, while 55 (79%) were aware of an online tool in the post-intervention phase **(figure 1)**. Furthermore, as a result of this intervention, 84% (59/70) of patients stated that they were more motivated to lose weight.

Discussion:

This quality study demonstrates that physician-led discussion of BMI improved patients' awareness and understanding of obesity/BMI and the associated health risks. Furthermore, they were aware of an online tool to calculate and keep track of their BMI following the brief intervention. Most notably, once patients knew their individual BMI and the associated health risks of obesity, they were more motivated to lose weight. Also, this intervention did not interfere with the daily workflow of providers.

Several studies in the past have shown that the actual diagnosing and reporting of obesity is underutilized.[22-24] A community study in Massachusetts, USA reported that less than 40% of their obese patients were diagnosed properly. Similar studies in Europe reported that less than 65% of the obese individuals were effectively diagnosed.[23,24] One study examined the role of nutrition and physical activity counseling during out-patients visits in adults with increased cardiovascular risks.[25] The authors reported that among adults with increased cardiovascular risks, less than 50% had nutrition counseling and less than 30% had physical activity counseling. Furthermore, the study demonstrated a lower likelihood of lifestyle counseling in older patients, patients with lower risk factors, and patients seen by generalists. Their study concluded that despite the
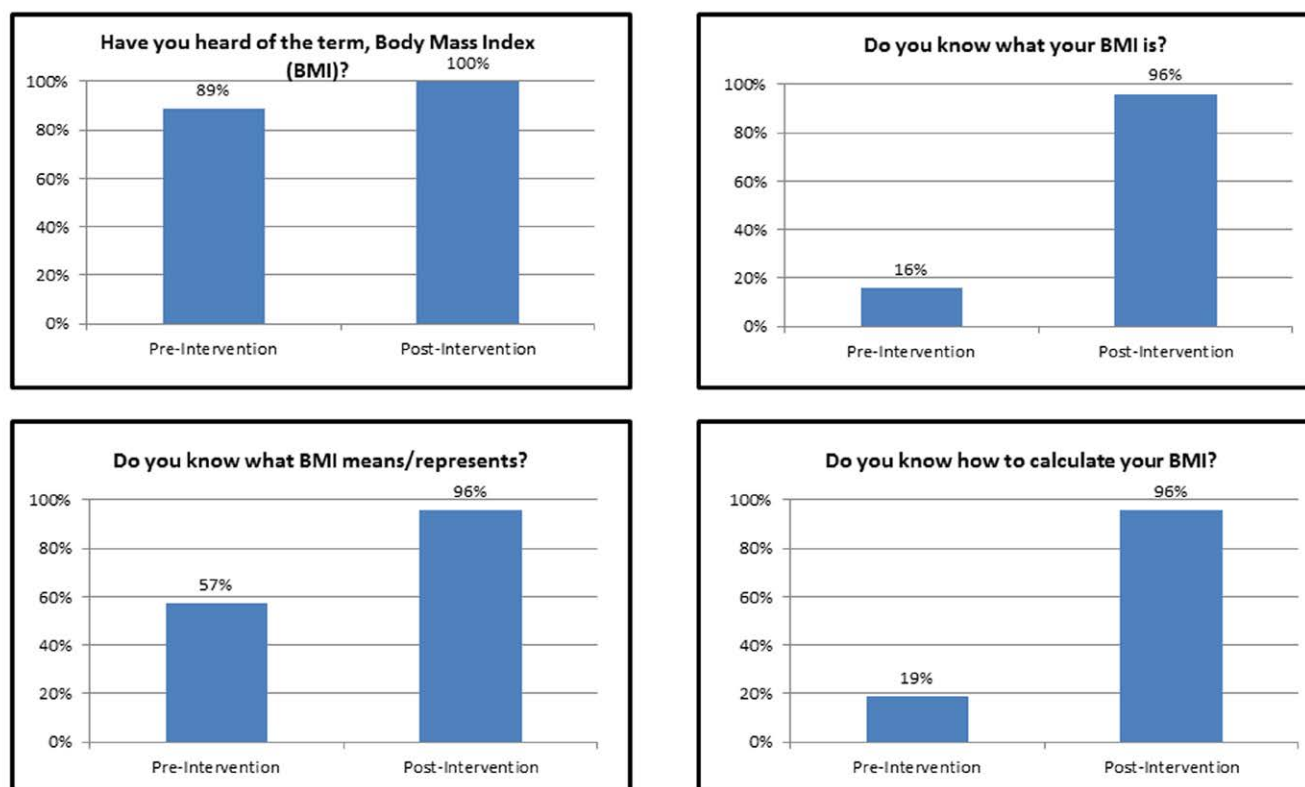
Have you heard of the term, Body Mass Index (BMI)? Pre-Intervention 89%, Post-Intervention 100%

Do you know what your BMI is? Pre-Intervention 16%, Post-Intervention 96%

Do you know what BMI means/represents? Pre-Intervention 57%, Post-Intervention 96%

Do you know how to calculate your BMI? Pre-Intervention 19%, Post-Intervention 96%

Table 1: Description of the responses pre and post intervention.

	Pre-Intervention	Post-Intervention
Have you heard of the term, Body Mass Index (BMI)?	89%	100%
Do you know what BMI means/represents?	57%	96%
Do you know what your BMI is?	16%	96%
Do you know how to calculate your BMI?	19%	96%
Do you know what health risks are associated with an elevated BMI?	66%	96%
Are you aware of any online resource for calculating/tracking your BMI?	17%	79%

availability of national guidelines, nutrition and physical activity counseling were less than adequate during outpatient visits.[25] A recent study was conducted at our institution to evaluate whether primary care internal medicine physicians documented obesity as a diagnosis and developed a management plan.[26] Of the 10,000 total patients, approximately 25% were obese (BMI $\geq$ 30 kg/m2) and only 19.9% of these patients had obesity as a diagnosis and 22.6% had a treatment plan for obesity.[26] Our study similarly demonstrated that less than 22% patients were aware of their current BMI, as this was not being addressed.

More than two-thirds of our cohort was aware of the term body mass index. Furthermore, 66% of our patients were aware of the health consequence of obesity prior to the intervention. Despite this, our results show that only 17% were aware of an online resource for calculating and tracking BMI. One reason for this could be that even though BMI calculators are readily available on the internet and telephone apps, patients are not aware of the health implications of BMI and hence not using them. Further studies such as an online survey are required to assess the reasons for not using an online BMI calculator tool. We expected a larger number of patients to be aware of an online tool after the intervention; similar to other endpoints (79% vs.

96-100%). This deviation may be due to patient preferences in method of learning or other factors that could be further evaluated in a larger study.

There are several limitations to the present study. One limitation is the small sample size of the patients in our cohort. Furthermore, though we tried to standardize the way that every participating physician disseminated the information about BMI and obesity, each had their own unique style of presenting which might have influenced patients overall. Also, the present study was conducted in an academic setting and hence will be difficult to generalize more broadly. Further larger studies in a primary care setting with a randomized controlled prospective design are required to improve the awareness of obesity.

In summary, when physicians actively engage patients in a discussion about BMI and weight loss, not only do patients become better informed about their personal health and associated risk factors, but they also become more motivated to lose weight. Furthermore, with the introduction of the online resources to calculate BMI, more patients become aware of the importance of knowing their BMI. This helps these patients to participate in the decision making of their health when seen by a physician. Knowing their own BMI also helps them understand

the importance of physical activity and life style changes and co-morbidities associated with obesity.

Appendix: Survey Questionnaire

- Have you heard of the term, Body Mass Index (BMI)?

- Do you know what BMI means/represents?

- Do you know what your BMI is?

- Do you know how to calculate your BMI?

- Do you know what health risks are associated with an elevated BMI?

- Are you aware of any online resource for calculating/ tracking your BMI?

AUTHOR CONTRIBUTIONS

SN, ABM, BMR and AJM were involved in the concept, design and conducting of the manuscript. They were also involved in the critical review of the manuscript. SN, JEV, DN, and HSA-L created the survey. SN, ABM and JEV were involved in the data collection, data analysis and drafting the manuscript.

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