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A Resident-Led Quality Improvement Initiative to Improve Obesity Screening

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Abstract

Instruction on quality improvement (QI) methods is required as part of residency education; however, there is limited evidence regarding whether internal medicine residents can improve patient care using these methods. Because obesity screening is not done routinely in clinical practice, residents aimed to improve screening using QI techniques. Residents streamlined body mass index (BMI) documentation, created educational materials about obesity, and launched an obesity screening QI initiative in a residency clinic. Residents designed plan-do-study-act cycles focused on increasing awareness and maintaining improvements in screening over a 1-year period. Documentation rates were collected at baseline, 2 weeks, 6 months, and 1 year post-intervention. At 1 year, obesity treatment rates also were collected. BMI documentation rates after 1 year were higher than baseline (43% vs 4%, $P < .0001$). In obese patients, BMI documentation was associated with lifestyle counseling (34% vs 14%, $P < .01$). An internal medicine resident-led QI project targeting obesity can improve screening.

Keywords

medical education; quality improvement; obesity screening; body mass index

Historically, residents have been largely excluded from quality improvement (QI) initiatives in hospitals and clinics.¹ More recently, leaders in QI and medical education have called for the incorporation of QI in residency training.² In fact, the Association of American Medical Colleges convened a special meeting to engage residency educators specifically to address this need.³ The Accreditation Council for Graduate Medical Education (ACGME) has long recognized the need to incorporate residents in QI efforts and has established practice-based learning and improvement (PBLI) as a core competency of residency education. PBLI requires that residents systematically analyze practice using QI methods and implement changes with the goal of practice improvement. Going one step further, the new 2010 ACGME-proposed requirements for residency training programs state that program directors

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must “ensure that residents are integrated and actively participate in interdisciplinary clinical quality improvement and patient safety programs.”⁴ Meeting these goals is especially challenging for internal medicine residents who are also required to perform QI in the context of their ambulatory clinic, where they often lack support and resources.^{5,6} Recent research on PBLI has shown that trainees are being integrated into QI learning and teaching and are learning through QI experiences.^{7–17} However, few studies provide results demonstrating the impact of resident-led QI efforts on care processes,^{7,15,18–20} and few have been performed in an internal medicine (IM) residency ambulatory clinic.⁷

One particular challenging area that is ripe for improvement work in IM residency clinics is the prevention and treatment of obesity. Similar to the national population, residents’ patients have a high prevalence of overweight and obesity, which affects more than 50% of patients.^{5,21} Even though the US Preventive Services Task Force recommends obesity screening for all adults by calculating body mass index (BMI; weight in kilograms divided by height in meters squared), numerous studies have shown that primary care physicians do not routinely screen their patients for obesity,^{22–24} and efforts to improve screening rates have been limited. No previous study has explored if resident-driven QI efforts to improve obesity screening in residency clinics can successfully change practice. The goal of this study was to assess if a resident-led initiative using QI methods could improve obesity screening in a resident clinic.

Methods

Setting

The resident clinic is part of the University of Chicago Medical Center Primary Care Group, which is an urban primary care practice staffed by 95 IM residents and 35 attending physicians. Residents are required to present each patient’s history and physical to attending physicians and to act as the patient’s primary care provider. Attending physicians are not required to examine residents’ patients unless a resident has practiced for less than 6 months. Residents are provided a patient intake form that contains data collected by triage nurses (eg, vital signs, smoking status). Patient intake forms are used by residents to dictate patient visits and are discarded after use. Dictations include the problem lists, past medical/social/family history, review of systems, physical examinations, and assessment and plans. No standard template is provided. Residents are expected to complete dictations within 1 week of patient visits. Dictations are transcribed and stored online securely (EMDAT, Fitchburg, WI). The University of Chicago Institutional Review Board deemed this study exempt from review.

Planning the Intervention

As part of a Quality Assessment and Improvement Curriculum, which has been described previously,¹⁰ all second-year residents complete chart reviews, gather patient surveys, and complete a system survey using the American Board of Internal Medicine Clinical Preventive Services Practice Improvement Module. After reviewing the system survey results, all residents work in teams of 9 to 12 members to develop a plan for improvement.

A group of 10 second-year IM residents reviewed results from the system survey during the first week of a 1-month ambulatory medicine rotation in January 2007. The results demonstrated that only 4% of patients were at goal BMI (<25). During their audit, residents noted that few patient charts included obesity screening with formal calculation of BMI, although many patients seen in the clinic were obese. To improve the care of obese patients, residents chose to improve the process used to screen for obesity and to educate residents, staff, and patients on the importance of obesity screening.

The majority of QI planning occurred during the second and third weeks of the 4-week ambulatory medicine rotation (Figure 1). Residents created a process map of how obesity screening occurred during patient visits (see the appendix). The process map exercise revealed that patient height was not routinely measured during visits and that the responsibility of height measurement was left to residents. Residents and nursing staff decided to install a ruler in the triage area for nurses to measure height; a space for nurses to note height and weight was added to the patient intake form used by resident physicians. Residents decided that physicians would be responsible for calculating BMI because it would not be feasible for nurses to explain the concept of BMI to patients during triage. Furthermore, a point-of-care BMI chart was selected to post in clinic rooms for residents to use to diagnose obesity. To empower residents to counsel their patients about obesity, a patient educational handout with information about obesity²⁵ was created to be used for a preclinic education session.²⁶ Residents also created a case-based lecture on obesity screening to be used during the QI launch.

During the fourth and last week of the ambulatory rotation, the launch of the intervention was scheduled to introduce the new process of height, weight, and BMI data collection and educational tools. Residents planned to perform 3 plan-do-study-act (PDSA) cycles focused on maintaining process improvements and obesity education over the next year. All 10 residents would participate in one of the PDSA cycles during a 4-week ambulatory rotation. Because of resident schedules, smaller subsets of residents from the original team would work on each of the 3 PDSA cycles.

Planning the Study of the Intervention

Two weeks before the intervention, baseline rates of height, weight, and BMI documentation were collected from charts of patients cared for by second-year IM residents. Further data collections were planned during elective and ambulatory medicine rotations 2 weeks and 6 months after the intervention. Additional data collection was planned for 1 year after the intervention, which would include obesity screening as well as rates of lifestyle modification counseling and dietitian referral for obese patients, defined as a BMI ≥ 30 , calculated from documented heights and weights of patients cared for by all IM residents. Because residents at our institution have clinic weekly, a 1-week duration was chosen for each data collection period. All data collection was scheduled during elective and ambulatory medicine rotations. Although statistical process control (SPC) is often considered a gold standard for measuring process change, this approach requires data from at least 12 different points to determine stable trends.²⁷ SPC was not used because at least 4 months of weekly data collection would be required, which was not feasible given the marked time constraints of IM residency resulting from inpatient medicine responsibilities. Two sample tests of proportions with 2-sided α of .05 were used. Statistical analysis was performed using Stata, version 10.0 (StataCorp LP, College Station, TX).

Results

During the last week of the ambulatory medicine rotation in January 2007, the “BMI campaign” was launched. The group of 10 residents advertised the process improvements during a regularly scheduled house staff lunch, which is attended by the majority of IM residents. They informed residents that nursing staff would begin measuring and documenting patient height during triage. The new BMI education materials for patients and updated patient intake form were stocked in the clinic. Stickers advertising the QI project were distributed to residents and posted throughout the clinic. Laminated BMI charts were posted in the clinic and faculty preceptors reviewed the case-based lecture on obesity screening with residents before their weekly scheduled clinic. Residents also taught the importance of obesity screening to nurses during their regularly scheduled meeting. Two

weeks after the launch, patient charts were reviewed for rates of height, weight, and BMI documentation ($n = 162$).

In August 2007, 7 months after the launch of the QI initiative, residents began the second PDSA cycle (Figure 1). They collected height, weight, and BMI data on patients cared for by residents 6 months after the intervention ($n = 119$). Residents reexamined process improvements and found that several BMI charts were missing. Theories as to why the charts were missing included the possibility that physicians or patients removed them for personal use, attending physicians took them to their clinic, or that charts were unintentionally disposed of. The charts were replaced and attempts to identify why they had been missing were not made because of limited resident time and because the charts were inexpensive. Residents also reported that peers felt uncomfortable performing obesity screening because they were unaware of local resources for weight management. Residents created a trifold patient pamphlet highlighting local affordable exercise and nutrition resources. This pamphlet was distributed to all residents during a house staff lunch and stocked in clinic areas.

Two months later, in October 2007, residents performed a third PDSA cycle (Figure 1). Residents disseminated early data to residents about the changes in BMI documentation resulting from the QI project. In December 2007, residents performed the last PDSA cycle (Figure 1). After noting BMI charts missing again and carefully considering other styles of BMI charts, the same chart was chosen because it was the least expensive. At 1 year after the launch of the BMI campaign, charts of patients cared for by all residents were audited for documentation of height, weight, BMI, and obesity treatment plans ($n = 498$).

Outcomes

Although rates of height, weight, and BMI documentation increased dramatically 2 weeks after the intervention, this level of improvement was not sustained at 6 months (Figure 2). Specifically, BMI documentation in clinic notes increased from 4% to 79% after 2 weeks, but declined to 41% after 6 months. After 1 year, BMI documentation rates were significantly higher than baseline (43% vs 4%, $P < .0001$), as were rates of height and weight documentation (75% vs 12%, $P < .0001$; 93% vs 89%, $P < .0001$, respectively). Interestingly, there was a significant difference in documenting BMI by residency year (Figure 3). First-year residents, who had started residency after the BMI campaign launch, were less likely to document BMI than residents who were present during the BMI campaign (19% [21/113] vs 41% [157/385], $P < .0001$). Those patients with BMI recorded also were more likely to have documentation of lifestyle modification counseling (34% [32/95] vs 14% [14/99], $P < .01$). There was no association between BMI documentation for obese patients and referral to a dietitian (10% with [9/95] vs 7% [7/99] without documentation, $P = .6$).

Discussion

This study suggests that residents can use QI methods to improve the quality of obesity screening in their clinics. The rates of height, weight, and BMI documentation significantly increased after the intervention. Even though they were not sustained after 1 year, rates of documentation were significantly higher than at baseline. Documentation of BMI was associated with higher rates of counseling obese patients about diet and exercise. Most notably, the process improvement of height measurement by nursing staff was sustained. Other changes, such as posting BMI charts in clinic areas, proved difficult to maintain.

There are many possible explanations for why rates of BMI documentation increased but were not sustained. One possible reason is because screening for obesity was perceived as

futile by many residents because effective and feasible treatments for obesity do not exist. A similar cynicism toward obesity treatment has been expressed among the larger medical community,²⁸ highlighting the need for more research on obesity treatments. It is worth noting, however, that the first-year residents, who were not present for the initial launch, still screened for obesity at higher rates after the QI project compared with baseline rates, which demonstrates the effectiveness of some system improvements. The decline in rates after 1 year also suggests that certain aspects of the intervention, such as obesity education and marketing of the QI project, may need to be repeated. Unlike BMI documentation, the rate of height measurement after 1 year was sustained, highlighting that nurses continued with the system improvement. This finding may be a result of differences in clinical practice between physicians and nurses. Because nurses generally have less autonomy in making clinical decisions than physicians,²⁹ they may have adopted height measurement more easily as a part of their job responsibilities. Although relying on nurses instead of physicians to calculate BMI could lead to higher rates of obesity screening, it is unclear whether this would lead to appropriate counseling and treatment of obesity by physicians. Unfortunately, there was a low rate of dietitian referral for obese patients, even though rates of resident physician-led counseling increased. This may reflect the lack of accessible dietitian resources available in the resident clinic. Additionally, BMI charts were surprisingly difficult to retain, which may be because of high foot traffic and many health care workers in the patient rooms and clinic dictation areas.

This study has implications for involving residents in QI and for efforts to improve obesity screening. There were many challenges to implementing this resident-led QI initiative. Because residency is a period of training and career development, residents have many competing responsibilities including inpatient rotations, academic research, outpatient clinic, and education. These responsibilities make it challenging for residents to dedicate time to additional projects outside of requirements. In addition, resident turnover may limit the success of QI projects. Similar to other studies on QI projects involving residents,^{7,15,20} this study was able to show that a resident-led QI project could be associated with improved patient care. However, unlike previous studies, which have been conducted in family medicine^{15,18} and pediatric²⁰ residency programs and used a stand-alone PBLI curriculum⁷ or a task force,¹⁹ this study integrated the PBLI curriculum into an IM ambulatory curriculum¹⁰ with a team-based resident-led QI project. Additionally, the curriculum used in this study has been shown to improve resident knowledge about QI,³⁰ just as many other studies on PBLI curricula.^{12,16,31} For example, 89% of residents rated their comfort level with PDSA cycles moderate to high after this curriculum, compared with only 9% of residents prior to the curriculum.³⁰ This study adds to a very small literature about methods to improve obesity screening. In the only study on BMI documentation in which BMI charts were posted throughout the clinic areas, rates of BMI documentation were 49% in the intervention group compared with 21% and 32% in the control groups.³² Of note, our 1-year results are remarkably similar to the prior study, highlighting the importance of redesigned processes (ie, posting BMI charts, nurses measuring height, redesigned forms).

This study has several limitations. Although it was performed at a single academic clinic, it is likely that residents at other institutions will be able to adopt similar QI methods to improve clinical practice. Also, because of the constraints of resident time and turnover, data collection could only be cross-sectional and based on convenience samples. Therefore, conclusions regarding causality are limited.

In conclusion, our study suggests that residents can effectively use QI methods to improve the quality of patient care in residency clinics. This resident-led QI initiative resulted in sustained moderate improvements in obesity screening in a resident clinic. Future studies

could evaluate if other resident-led QI projects can similarly improve patient care in resident clinics and if increased obesity screening is associated with improved patient outcomes.

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Appendix Height, Weight, and Body Mass Index Documentation Process Map

Figure 1.
Plan-do-study-act (PDSA) cycles
BMI, body mass index

Figure 2.

Percentage of patient charts with height, weight, and body mass index (BMI) documentation after quality improvement (QI) intervention*

*All $P < .0001$ as compared with baseline data prior to the QI intervention.

Figure 3.
Percentage of patient charts with body mass index documented 12 months after quality improvement (QI) intervention by residency year
* $P < .0001$ as compared with first-year residents.