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Teaching Medical Students About Obesity: A Pilot Program to Address an Unmet Need Through Longitudinal Relationships With Bariatric Surgery Patients

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Abstract

Background—Despite obesity's relevance and impact, curricula addressing obesity are underrepresented in clinical medical educati0n.A novel pilot program to begin teaching medical students about care of the obese patient was developed and student attitudes toward obesity and bariatric surgery were assessed.

Methods—The authors paired third-year students with obese patients undergoing bariatric surgery. Students established a longitudinal patient relationship, received faculty mentorship, and kept a reflections journal. An attitude assessment survey was administered before and after third year. Reflections were analyzed for common themes.

Results—Baseline student responses differed from those previously reported for practicing physicians on many survey statements, including more strongly agreeing with the relationship between obesity and serious medical conditions ($P<0.001$), the need to educate patients about obesity risks ($P< .001$), and willingness to recommend bariatric surgery evaluation ($P = .004$).These differences were maintained after clinical clerkships. Reflection themes included recognition of obesity stereotypes, improved estimation of body mass index, and awareness of physicians' attitudes about obesity.

Conclusion—Development and assessment of a novel pilot program to teach third-year medical students about obesity and bariatric surgery suggests a potential impact on student attitudes and understanding of obesity and obesity surgery. Students today may have different attitudes toward obesity than those reflected in prior data for physicians in practice, and programs such as this may help maintain positive attitudes.

Keywords

surgical education; obesity; bariatric surgery; patient-doctor relationship; humanism in medicine

Introduction

Obesity is one of the most pressing issues in American health care today. Centers for Disease Control and Prevention data indicate that more than one third of all American adults are obese, defined as a body mass index BMI) >30[1,2]; an additional one third are overweight (BMI = 25 to 29.9).[3] Despite the clinical relevance and impact of obesity,[4-10] the training of

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medical students and physicians about obesity and its management has not changed significantly in decades. Curricula specifically addressing obesity are characteristically underrepresented in undergraduate medical education, particularly during the clinical years. One of the paramount challenges facing today's medical educators is the preparation of future generations of doctors to care for the rapidly growing population of obese patients.

Negative attitudes toward obesity among primary care doctors are prominent.[11-13] A recent report found higher patient BMI was associated with lower physician respect.[14] In one study, more than half of the responding physicians describe obese patients as "awkward, unattractive, ugly, and noncompliant," and one third view obese patients as "weak-willed, sloppy, or lazy."[11] The majority of primary care doctors surveyed feel "patients lack discipline to lose weight," "patients want an easy way out," and "patients are not motivated to lose weight."[13] In addition, physicians are more likely to be pessimistic about their ability to treat obesity compared with other chronic illnesses. These negative attitudes and tendencies are more prevalent among younger physicians.[13]

To our knowledge, no studies have specifically evaluated medical student attitudes toward obesity and how these attitudes may be shaped by medical training. Similarly, no programs dedicated to teaching medical students about obese patients have been described. Educators increasingly acknowledge the role of the "hidden curriculum"-the "unrecognized transmission of attitudes and beliefs relating to patient care and professional values"-in clinical training.[15] This hidden curriculum may have particular relevance to how medical students learn to perceive obesity. A total of 98% of medical students have heard physicians refer to patients in a derogatory manner,[16] and obese patients are common targets of derogatory humor in clinical settings. [17-19]

As part of a longitudinal curriculum[15] a small group (13) of third-year medical students, we developed a pilot program to teach medical students about obesity and the care of obese patients in an interdisciplinary manner. This program, described below in detail, is an elective experience that pairs clinical clerks with patients scheduled to undergo bariatric surgery. The program facilitates a longitudinal relationship between students and obese patients that supplements the students' typical clinical clerkship experiences.

Using the students who were part of the longitudinal curriculum but not participating in the elective as a control group, we assessed the impact of the program on student perspectives on obesity. We hypothesized that (a) entering third-year students' attitudes toward obesity would be more positive than those previously reported attitudes of practicing physicians and (b) participating in this pilot program would preserve positive attitudes toward obesity.

Methods

The longitudinal bariatric surgery patient elective focuses on an obese patient who is being evaluated for bariatric surgery. This pilot program is offered in the context of the principal clinical experience (PCE), a novel pedagogic approach to the core clinical clerkships of medical school that has been described in detail.[15] The elective pairs each participating PCE student with an obese patient who is undergoing evaluation for either gastric banding or gastric bypass surgery; the patient volunteers to work with a student for the year.

Longitudinal Bariatric Surgery Patient Curriculum

Curricular goals—The goals of the program are for students to (a) interact with an obese patient and his or her family over an extended period of time in both ambulatory and inpatient settings; (b) develop an appreciation of the impact of obesity on an individual from a personal, social, medical, and economic perspective; and (c) enter into an extended

mentoring relationship with a faculty member caring for an obese patient. The longitudinal bariatric surgery patient elective comprises multiple elements as detailed below. An online curriculum also contributes to clinical knowledge.[20] Funding for this program was provided within the context of the PCE by both Harvard Medical School and Beth Israel Deaconess Medical Center

Interdisciplinary patient visits—The student participates in all aspects of their assigned patient's preoperative evaluation, including an initial nutritional assessment, psychological evaluation, medical evaluation, and small group education sessions with a surgeon. In addition to attending all bariatric surgery-related visits, students also participate in the patient's care at any visit to the medical center, including primary care visits, other surgeries, and emergency department visits.

Clinical skill building—Clinical skills gained at initial visits include calculating BMI and accurately measuring blood pressure in morbidly obese patients. During a patient's laparoscopic banding or bypass procedure, the student scrubs in with the surgical team and assists with camera positioning, Foley catheter placement, and superficial skin closures. Postoperatively, students may assist with suture removal and lap band fills in the office. Students learn about the risks of long-term postoperative nutritional problems, including deficiencies of vitamin B_{12} iron, calcium, and folate.

Longitudinal faculty mentorship—At monthly meetings, students hear researchers discuss technical, endocrinologic, and epidemiologic aspects of bariatric surgery and obesity. Students have the opportunity to discuss their patients with clinical and research faculty, present relevant papers, ask questions, and interact informally with faculty about their clinical and/or research interests.

Self-reflection—Students maintain a writing journal during their experience; they begin with reflections on their own beliefs and stereotypes about obesity on entering the elective. Additionally, students write about health care systems topics, including quality improvement and patient safety issues, specifically related to their obese patients. Finally, students reflect on their own feelings and the transition they make from lay person (identifying with the patient) to medical professional (identifying with the physician) over the course of their third year. At the end of the elective, students review their journal entries and submit a written reflection that consolidates their learning.

Students

All 13 students participating in the PCE (2007-2008) were offered the opportunity to enroll in a longitudinal patient elective. Four students (BA) enrolled in the bariatric surgery longitudinal patient pilot program; the 9 students who did not enroll in this pilot program served as controls (CO).

Assessment

We assessed student attitudes before their third-year clerkships and again at the end of the year using both qualitative and quantitative approaches. This study was approved by the institutional review board.

Attitude assessment survey—All students (BA+CO) completed a survey of attitudes and knowledge of obesity and bariatric surgery before and after their third-year clerkships. This instrument consisted of 16 statements that the students rated on a Likert-type scale of 1 (strongly disagree) to 5 (strongly agree). The combined (BA+CO) baseline data entering third year of medical school were compared with previously published data from practicing

physicians using the same instrument, and a second comparison was made after completion of third year. Additionally, BA and CO survey responses were compared with each other at baseline and at the completion of the third year clerkships. All comparisons were made using the Student's 2-tailed unpaired t test with a significance level of $P < .05$.

Reflection essay thematic analysis—We analyzed 7 student final written reflections, 4 produced by students in our study cohort (BA) and 3 written by students in this elective from prior academic years. We analyzed the data by first identifying recurrent themes; each reflection paper was then reviewed, with relevant statements classified under a thematic category. A compilation of 4 written reflections has been published.[21]

Results

Attitude Assessment Survey Data

Table 1 shows the survey results of all (BA+CO) entering third-year students at baseline (n = 13; 100% response rate) and compares these with published physician survey data (n = 620).[11] Statistically significant differences between student and physician attitudes were found in 4 of 16 (25%) items. Students more strongly agreed that "obesity was associated with serious medical conditions," that "it was necessary to educate obese patients about the health risks of obesity," and that they would "recommend a surgical evaluation if a patient met criteria for obesity surgery." Finally, students tended to disagree with the statement "Most obese patients could reach a normal weight (for height) if they were motivated to do so," whereas physicians tended to be neutral (2.4 vs 3.1, $P = .02$). These differences persisted at the completion of the third-year clerkships, except there was no longer a statistical difference between students and physicians in their belief in the necessity of educating patients with obesity about the health risks associated with excess weight. At the end of third year, students were more likely to believe that-"most obese patients will not lose a significant amount of weight"- (3.8 for students vs 3.1 for physicians, $P = .002$).

Bariatric Elective Students

Compared With Controls—Baseline characteristics of the BA and CO students were similar in age (mean age 24 years vs 26 years, $P = .2$) and gender (50% vs 67% female, $P = .999$). Table 2 shows that the 2 groups were similar in their baseline responses to all survey items except item 9. BA students disagreed, whereas CO students more strongly agreed, with the statement that "most obese patients will not lose a significant amount of weight" (2.3 for BA participants vs 4.0 for controls, $P = .003$).

Table 2 also shows the comparison of responses of the 2 groups of students following their completion of their third-year clerkships. After the third year, BA and CO students differed on 4 items. BA students less strongly agreed that "obesity is a chronic disease" and that "physicians should be role models by maintaining a normal weight." BA students more strongly disagreed that "most obese patients could reach a normal weight if motivated to do so" and that "medications to treat obesity should be used chronically." Of note, the difference between the 2 groups in their belief that obese patients will not lose a significant amount of weight disappeared; whereas CO students remained approximately the same (4.0 to 3.9), BA students tended to endorse this belief more strongly than they had at baseline (from 2.3 to 3.5).

Self-Reflection Thematic Analysis

Thematic analysis of student written reflections revealed the following 4 most common themes. Benefits of longitudinal experience. Students described the longitudinal nature of their experience, writing about the depth with which they were able to know their patients as

well as the importance of seeing changes over time. As one student wrote, “As he (the patient) becomes smaller, I will also surely grow in my own way, having been able to witness firsthand a physical and psychological transformation that few other medical students have been fortunate enough to experience.” Another student remarked on the difference between his experience of participating in an operation with his longitudinal patient as compared with one during his general surgery clerkship; he noted that he “didn’t have the same sense of detachment that [he had] had during most of my surgery rotation.” Students identified the longitudinal aspect of the elective as novel and important in their learning.

Obesity stereotypes—All 7 reflection papers unanimously described awareness that they held biases about obese patients prior to the elective, particularly a belief that obese patients were lazy or unmotivated. One student wrote,

> Despite learning how hard it is to diet, I still went to my first bariatric surgery information session with a lot of prejudices in mind. I couldn’t help but believe that these people had made an unconscious decision to become obese.

Although BA students entered the elective believing that patients were obese more or less for lack of trying to lose weight, this assumption was quickly challenged and reversed. Another student wrote, “Patient R approaches his upcoming surgery with a zeal that would challenge anyone who would claim that ‘laziness’ or ‘apathy’ were the reasons for his heavy frame.” Yet another student commented that what surprised him most when he met his patient was that “he was so goal-directed.”

Students’ reflections also indicated that their longitudinal relationships overcame the preconceived attitude that obese patients did not typically make efforts to lose weight prior to considering surgery. One student enumerated the number of failed attempts his patient had had

> He lost 20 pounds on Nutrisystem, 40 pounds on the Atkins diet, 10 pounds with Metabolife, 35 pounds once on Slim-Fast and 75 pounds another time, 50 pounds with Fen/Phen and 45 pounds with Diet Workshop. He certainly wasn’t overweight for lack of trying.

Students wrote about the difficulty their patients had had in maintaining weight loss. In reviewing their patients’ diet histories, students commented on an appreciation of the tremendous amount of time, energy, and money that patients had put into trying to lose weight.

Underestimating body mass index—Students described surprise at how poor their initial estimates of BMI had been

> I had imagined what a BMI of 43 would look like. I was immediately struck that he looked much smaller than I had anticipated … that he looked no bigger than many people whom I see on a daily basis underscores the prevalence of obesity in society today.

Another student was surprised that his patient with a BMI of 41.9 looked only “a bit chubby” and noted that he would not have spent much time addressing his weight if he had been the student or physician seeing him in an ambulatory setting. In correlating specific BMIs with individual patients, students learned to better estimate BMI and recognized the true prevalence of obesity in their patient populations.

Deficits in physicians’knowledge and attitudes—Many BA students described their observations of physician attitudes toward obese patients and physician practices. One

described an attending surgeon who “disgustedly took off his gloves at the end of a total hysterectomy on a particularly obese woman, saying that ‘these people’ take all the joy out of surgery.” Two other students emphasized the lack of attention paid to weight management, noting that doctors were reluctant to recommend weight loss surgery to patients. This was true even in outpatient primary care settings, where more attention to weight management might be expected.

Discussion

Obesity is common, deadly, and contributes to problems relevant to all clinical fields in medicine, yet obesity is not typically a focus of a third-year student’s learning. Students commonly have short-term interactions with obese patients and may be exposed to elements of the “hidden curriculum,” including negative or scornful physician attitudes toward obese patients or the sense that treatment for obesity is futile or unimportant, all attitudes demonstrated to be prevalent among physicians. Short-term clinical interactions may limit the development of meaningful relationships with obese patients, may result in degradation of empathy, and may lead to deterioration of student attitudes toward obese patients and the management of obesity. We describe a novel pilot program that approaches the issue of obesity education using an interdisciplinary, longitudinal format. To our knowledge, this is the first reported longitudinal obesity-specific clinical program for third year students. Through these longitudinal experiences, students established relationships with individual obese patients, learned about obesity and its management through an interdisciplinary chronic disease model, and they were able to appreciate the powerful social, environmental, biological, and economic forces that influence patients’ body weight and body image. Furthermore, longitudinal experiences enabled students to become a key part of a patient’s care team and to serve as a link between the patient and specialists across a variety of fields.

Our program combines elements of a longitudinal patient relationship, interdisciplinary patient care, clinical skill building, self-reflection and dedicated faculty mentorship and teaching by bariatric surgery faculty who are strong advocates for caring, humanistic and respectful treatment of obese patients.

Our survey data from this small pilot program yielded intriguing results that must be interpreted with caution. The data demonstrate that students entering third year do have different attitudes from prior published data obtained from a cohort of physicians in practice.” For our comparison of the historic controls (n = 620) to all third-year students, we had a moderate statistical power (43%) to detect differences of 0.5 on the Likert-type scale, which we felt was a meaningful difference. The students’ baseline attitudes suggested they were more optimistic, more likely to attempt an intervention, more eager to educate, more willing to refer patients for obesity surgery, and more engaged with the relationships between health problems and obesity. Although we are wary of drawing broad conclusions from differences in any single survey item, our findings do show positive shifts in attitudes among contemporary students compared with physicians studied approximately 8 years ago in the care of obese patients. These potential differences may be because of any number of factors including extent of medical training, physician culture, or simply generational differences between today’s students and physicians surveyed in the past.

Students’ attitude toward bariatric surgery, for instance, may be more favorable because they learned, during the formative, preclinical phase of their training, that it was an accepted option for weight loss. Data from the students at the conclusion of their third year again provides interesting results from which we are cautious to generalize given the small numbers in our intervention group. Following their third year of clinical clerkships, students were slightly less motivated to educate patients about the risks associated with obesity, and

their attitude toward this statement was now similar to data from physicians in practice. It is possible that the decreased commitment to patient education may reflect a lack of emphasis placed on patient education in clerkships through physician modeling. Alternatively, it may reflect student longitudinal elective experiences: The in-depth student interaction with patients may have led students to conclude that patients were already knowledgeable about the risks and that the challenge lay elsewhere. Students at the end of the year were also more pessimistic about patients' ability to lose weight. Again, these changes could reflect exposure to the medical culture or their longitudinal elective experience itself; if a student worked with a patient who failed to lose weight, he or she might be more pessimistic.

Though limited by small numbers, we compared students in the program (BA) with their nonprogram peers (CO) to ensure that the BA students were not a self-selected group who had more positive attitudes toward obese patients prior to entering the program. Though the 2 groups' responses were comparable at baseline, some differences appeared after 1 year. Given the limitation of a very small sample size, the significance of these changes is not clear, but we view these data as suggesting that the longitudinal relationships our students developed in this novel pilot program may have helped them maintain their positive attitudes toward obesity. We believe the data are intriguing and larger-scale programs similar to what we have described merit further exploration.

Students' journals and self-reflection essays were powerful tools to consolidate their learning in this longitudinal experience. They indicated that the students identified their own previously held stereotypes about obesity and that many of these judgments were negated as a result of extended interactions with an individual patient across multiple visits with a variety of specialists. Students' reflections also poignantly demonstrated the negative influence of the hidden curriculum and suboptimal physician attitudes toward obesity. Other themes that emerged from these writings included an appreciation for the uniqueness of a longitudinal relationship in the setting of modem clinical clerkships in which rapid transit through the medical system is more typical. Additionally, students garnered specific skills that they may not have otherwise gained, including an improved ability to estimate and calculate BMI and recognize the true prevalence of obesity in our culture.

Recently, members of our group published a separate study of student self-reflections on the hidden curriculum.[22] The analysis included reflections by our BA and CO students' and by another group of third-year Harvard Medical School students at a different hospital written during the same year as this study. Although not a direct comparison, we note that only 2 of 30 self-reflections touched on obesity and neither focused on students' attitudes toward obesity or the care of the obese. Without specific curricular focus on obesity in clinical clerkships, it is likely that the opportunity for improving attitudes about obesity and obese patient care will be missed. Although it would be challenging to mandate clinical training in obesity or obese patient care for all medical students, curricular innovations such as this one are clearly needed to direct student learning and overcome entrenched biases and attitudes.

Our study has several limitations beyond the small sample size. The study is not randomized: students self-selected into the pilot program. Students who volunteered for the pilot program may be those with the most knowledge about obesity and those with preferable attitudes toward this patient population; consequently, they may be least vulnerable to damage by the hidden curriculum. Although the students (BA vs CO) appeared similar on baseline survey assessment, it is notable that BA students entering the program were more optimistic about obese patients' ability to lose weight at baseline. We did not calculate the BMI of BA or CO students, and therefore it is not possible to draw conclusions about the influence of the students' own body type on our findings. Lastly, our comparison group in this study was composed of students enrolled in the PCE, a longitucdinal

curriculum that that has already itself been demonstrated to preserve patient-centered attitudes.[15] This comparison may have obscured some of the value of the longitudinal bariatric surgery patient pilot program.

Our data suggest that a pilot program for medical students to develop longitudinal relationships with bariatric surgery patients as a way to teach about obesity is worthy of further exploration and research. We hope to complete a more extensive evaluation of the evolution of student attitudes about obesity from entry into medical school through the preclinical curriculum. Innovations, such as this program, in clinical obesity education are needed to provide the foundation for a generation of new physicians to more thoughtfully and rationally engage the problem of obesity, which is so devastating for both individual patients and our healthcare system.

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Table 1

Physician and Student Attitudes Toward Obesity and Its Management[a]

No.	Item	Physicians (From Foster et al[11])	All (BA+CO) Students			
			Pre-Third Year		Post-Third Year	
		Mean (SD)	Mean (SD)	*p*[b]	Mean (SD)	*p*[c]
1	I believe it is necessary to educate obese patients on the health risks of obesity	4.5 (0.6)	4.9 (0.3)	<.001	4.7 (0.5)	.179
2	Obesity if a chronic disease	4.5 (0.9)	4.0 (1.0)	0.98	4.5 (0.5)	.799
3	Obesity is associated with serious medical conditions	4.4 (0.8)	4.9 (0.3)	<.001	4.9 (0.3)	<.001
4	Physicians should be role models by maintaining a normal weight	4.1 (0.8)	4.0 (0.7)	.624	3.9 (0.9)	.477
5	A 10% reduction in body weight is sufficient to significantly improve obesity-related health complications	3.8 (0.9)	3.8 (0.7)	.883	4.1 (0.8)	.218
6	Most obese patients are well aware of the health risks of obesity	3.2 (1.0)	3.1 (1.2)	.717	2.8 (1.1)	.259
7	Medications to treat obesity should be limited to short-term (<3 months) use	3.2 (1.2)	2.8 (1.0)	.155	3.1 (1.3)	.732
8	Most obese patients could reach a normal weight (for height) if they were motivated	3.1 (1.1)	2.4 (1.0)	.020	2.4 (0.8)	.006
9	Most obese patients will not lose a significant amount of weight	3.1 (1.0)	3.5 (1.1)	.273	3.8 (0.6)	.002
10	I have negative reactions toward the appearance of obese patients	3.0 (1.1)	3.1 (1.1)	.810	3.0 (1.0)	1.000
11	If a patient meets the appropriate criteria for obesity surgery, I would recommend an evaluation by a surgeon	2.7 (1.1)	3.8 (1.1)	.004	4.1 (0.9)	<.001
12	Medications to treat obesity should be used chronically	2.6 (1.2)	2.6 (1.0)	.956	2.6 (0.8)	.945
13	For most obese patients, long-term maintenance of weight loss is impossible	2.5 (1.1)	2.7 (0.9)	.484	2.7 (0.9)	.440
14	It is acceptable to use “scare tactics” to obtain compliance of the obese patient	2.3 (1.0)	2.8 (1.1)	.150	2.6 (1.2)	.362
15	I feel uncomfortable when examining an obese patient	2.1 (1.0)	2.5 (1.0)	.206	2.5 (1.1)	.273

No.	Item	Physicians (From Foster et al[11])	All (BA+CO) Students			
			Pre-Third Year		Post-Third Year	
		Mean (SD)	Mean (SD)	*p*[b]	Mean (SD)	*p*[c]
16	It is difficult for me to feel empathy for an obese patient	2.0 (0.9)	2.5 (1.0)	.069	20. (1.0)	1.000

Abbreviations: BA, students enrolled in the bariatric surgery longitudinal patient pilot program; CO, controls.

[a]Points: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree.

[b]p value reported is result of 2-tailed t test comparing physician response with student baseline responses.

[c]p value reported is result of 2-tailed t test comparing physician responses with student responses after third year.

Table 2

Attitude Change Over the Year: Program Students and Controls[a]

Item No.	Pre-Third Year			Post-Third Year		
	Mean (SD)		p^b	Mean (SD)		p^c
	CO	BA		CO	BA	
1	4.9 (0.3)	5.0 (0.0)	.529	4.8 (0.4)	4.5 (0.6)	.433
2	4.1 (1.1)	3.8 (1.0)	.571	4.7 (0.5)	4.0 (0.0)	.004
3	5.0 (0.0)	4.8 (0.5)	.140	5.0 (0.0)	4.8 (0.5)	.391
4	4.1 (0.8)	3.8 (0.5)	.419	4.2 (0.8)	3.3 (0.5)	.027
5	3.9 (0.8)	3.5 (0.6)	.395	4.0 (0.7)	4.3 (1.0)	.661
6	2.8 (1.2)	3.8 (1.0)	.184	2.7 (0.9)	3.3 (1.5)	.509
7	2.9 (1.1)	2.5 (1.0)	.546	2.9 (1.4)	3.5 (1.0)	.392
8	2.7 (0.9)	1.8 (1.0)	.115	2.7 (0.7)	1.8 (0.5)	.028
9	4.0 (0.5)	2.3 (1.3)	0..3	3.9 (0.3)	3.5 (1.0)	.498
10	3.2 (1.2)	2.8 (1.0)	.505	3.1 (1.1)	2.8 (0.5)	.443
11	3.8 (1.3)	4.0 (0.8)	.762	4.3 (0.7)	3.8 (1.3)	.501
12	2.4 (0.9)	3.0 (1.2)	.358	2.9 (0.8)	2.0 (0.0)	.009
13	2.7 (1.1)	2.8 (0.5)	.891	2.7 (0.9)	2.8 (1.0)	.887
14	2.8 (1.2)	2.8 (1.0)	.968	2.8 (1.3)	2.3 (1.0)	.438
15	2.2 (0.8)	3.0 (1.2)	.192	2.3 (1.0)	2.8 (1.5)	.627
16	2.6 (0.9)	2.5 (1.3)	.929	1.9 (0.9)	2.3 (1.3)	.631

Abbreviations: BA, students enrolled in the bariatric surgery longitudinal patient pilot program; CO, controls.

[a] Points: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree.

[b] p value reported is result of 2-tailed t test comparing physician response with student baseline responses.

[c] p value reported is result of 2-tailed t test comparing physician responses with student responses after third year.