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Beliefs about the causes of obesity in a national sample of 4th year medical students

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Abstract

Objective—Physician knowledge of the complex contributors to obesity varies. We do not know whether today's medical students are graduating with deep understanding of the causes of obesity. Our objective was to assess beliefs about causes of obesity in a national sample of 4th year medical students.

Method—We randomly selected 2000 4th year students from a random sample of 50 U.S. medical schools and asked them to rate the importance of several factors as causes of obesity. Of those invited, 1244 (62%) responded. We conducted latent class analysis to identify groups with similar response patterns.

Results—Most students demonstrated knowledge that obesity has multiple contributors. Students fell into 1 of 4 classes: (1) more likely to endorse all contributors (28%), (2) more likely to endorse physiological contributors (27%), (3) more likely to endorse behavioral or social contributors (24%), and (4) unlikely to endorse contributors outside of overeating and physical activity (22%).

Conclusion—Though students were generally aware of multiple causes, there were 4 distinct patterns of beliefs, with implications for patient care.

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Practice implications—Targeted interventions may help to improve depth of knowledge about the causes of obesity and lead to more effective care for obese patients.

Keywords

Obesity; Medical students; Weight bias; Diet; Weight gain; Learning

1. Introduction

Behavioral, social, environmental, genetic, and endocrine factors contribute independently and jointly to obesity [1,2]. However, healthcare providers have historically focused on the behaviors that are most directly related to energy balance, overeating and lack of physical activity [3,4]. This focus supports physicians in helping patients modify behavior through education, meal planning, and patient-centered strategies such as motivational interviewing [5–7]. Although an important part of treatment, physician counseling interventions work inconsistently, and rarely lead to long-term weight loss maintenance [8]. This is one reason why many physicians do not provide weight loss counseling to their obese patients [9,10], despite the recommendations of the U.S. Preventative Services Task Force, and other clinical guidelines [11]. A biopsychosocial approach to obesity treatment may be beneficial [2]. There is evidence that providers who understand the biological, environmental, and other uncontrollable causes of obesity have more positive attitudes about their obese patients, and thus may judge or stigmatize obese patients less [12,13]. Obese patients have better weight loss outcomes when physicians provide counseling in ways that are seen as less judgmental or stigmatizing [14], and physicians may provide counseling more consistently if their patients are more successful and respond less negatively to advice [9].

Much more is understood about the complex causes of obesity than in the past, and thus today's medical students may be better positioned to provide non-judgmental patient-centered weight loss counseling than currently practicing physicians. However, little is known about whether the evidence for non-behavioral causes of obesity is being incorporated into medical school curricula, or increasing students' knowledge about causes of obesity. The goal of this brief report is to identify patterns of beliefs about the causes of obesity in a national sample of 4th year medical students in 2014. Though beliefs do not likely perfectly predict practice behaviors, identifying patterns of beliefs may help guide targeted instructional content about causes of obesity to possibly improve patient-centered practice.

2. Methods

We randomly selected 40 4th year students from each of a random sample of 50 U.S. medical schools selected from within strata of public private schools and region of the country (n = 2000) [15]. We ascertained students' email addresses from the American Medical Association Masterfile and publicly available school directories, and invited students to complete a web-based survey of their beliefs and attitudes about obesity. Of the 2000 students invited,1244 (62%) completed the survey. This study was approved by the Mayo Clinic and University of Minnesota IRBs.

We presented students with a list of contributors to obesity, and asked them to rate, on a 5-point scale (1: not at all; 5: extremely) how important each contributor is to the development of obesity [16].

We calculated the mean response and prevalence of each response for all causes. We then categorized responses into 2 groups, “Not at all”–”Somewhat,” and “Moderately”–”Extremely,” and conducted a latent class analysis (LCA) in MPlus 7.0 to identify groups of students with similar response patterns reflecting common underlying beliefs regarding the causes of obesity. A categorical latent variable was fit to the responses, with each category representing a different pattern of response. We selected the model with the number of categories that best fit the data using the Vuong–Lo–Mendell–Rubin likelihood ratio test. Participants were assigned to the category with the response category that most closely matched their own. Because there are no external standards for the relative importance of each cause, we characterized each class by comparing its conditional probability of holding a causal belief to the overall sample probability of endorsing that belief.

3. Results

The average age of respondents was 28.0 (SD = 3.2), 48% (611) was female. Eighty-five percent (1081) was born in the United States. Ratings of importance of each contributor are presented in Table 1.

The 4-class model was the best fit for these data (Vuong–Lo–Mendell–Rubin loglikelihood = −7219.10; p <.0001). The conditional probability of identifying a cause as moderately, very, or extremely important, given class membership, is presented in Table 2.

Every student in all latent classes was about as likely as the total sample to rate physical inactivity and overeating as important. Members of class 1 (which we labeled “Multi-cause”; 28% of sample) were more likely than the overall sample to endorse every listed cause. Members of class 2 (“Physiological”; 27%) were more likely to endorse genetic factors and metabolic defect, and less likely to endorse repeated dieting, restaurant eating, lack of willpower, and marketing/advertising of unhealthy foods. Members of class 3 (“Behavioral/Social”; 24%) were less likely to endorse genetic factors, metabolic defect, and endocrine disorders, and more likely to endorse poor nutritional knowledge, psychological problems, repeated dieting, restaurant eating, and marketing/advertising of unhealthy foods. Members of class 4 “(Energy Balance”; 22%) were less likely to endorse every cause except physical inactivity and overeating.

4. Discussion and conclusion

4.1. Discussion

We found that most 4th year medical students were aware of multiple causes of obesity, and endorsed behavioral, biological, and social contributors, although beliefs regarding the strengths of these contributors varied. Students almost universally agreed that energy balance is an important cause of obesity, and thus likely understood the importance of behavior change to weight loss. A large proportion believed a high fat diet, poor nutritional

knowledge, and genetic factors play moderately to extremely important roles. Students were least likely to endorse repeated dieting, lack of willpower, metabolic defect, food addiction, restaurant eating, endocrine disorder, and marketing/advertising of unhealthy foods. Repeated dieting, metabolic defect, food addiction, restaurant eating, endocrine disorder, and marketing/advertising of unhealthy foods might warrant greater emphasis in medical school curricula to provide a more complete picture of social and physiological contributors to obesity, and thus better prepare physicians to appropriately counsel and treat their patients. While lack of willpower was one of the lowest rated causes, more than 50% still endorsed it as moderately to extremely important, and intervention may be needed to prevent this belief from influencing the tone of weight loss communication.

Medical educators need to be aware of the diversity of perspectives of medical students on contributing factors to obesity in order to target curricula appropriately. Students clustered into 4 approximately equal sized groups based on their patterns of beliefs. The “Energy Balance” group rated every contributor other than overeating and physical inactivity as less important than the overall sample did. These students understand the importance of behavior change, to weight control. However, they also have the most limited view of social and physiological factors that impact body weight, and may be less well prepared to provide holistic and nonjudgmental counseling. Students in the Behavioral/Social group understand the role of multiple health behaviors, psychological problems, and social factors in obesity, but downplay the role of biological factors, and may benefit from education about the genetic and endocrine contributors to obesity. Students in the Physiological group believe that genetics, and endocrine and metabolic disorders play an important role in the development of obesity, but may provide more effective counseling to their obese patients if they received education about modifiable behaviors such as restaurant eating or weight cycling, and environmental influences on eating behavior. The Multi-cause group, which includes 28% of the sample, endorses the importance of every contributor to obesity at rates higher than most students, and may be best positioned to provide holistic patient-centered weight counseling to patients.

More research is needed to understand the relationship between beliefs and the provision of, and quality of, weight counseling, to inform interventions to improve the awareness of the contributing factors to obesity. Awareness of the different categories identified in this study may also help us understand variability in the effects of educational interventions or patient communication training on different groups of students.

A limitation of this study is rooted in the lack of consensus on the relative contribution of these causes in the population. We, therefore, evaluated group probabilities relative to the overall sample using LCA, but cannot evaluate the correctness of students’ beliefs about the absolute importance of each factor. A second limitation is the lack of research on the way beliefs about the causes of obesity affect the content or process of patient care. Also, all participants were students at US medical schools, thus findings may not generalize to students at schools outside of the U.S.

4.2. Conclusion

Overall, we found that 4th year medical students graduating in 2013 were aware of multiple contributors to obesity. However, students differed in their beliefs about the relative contribution of causal factors, potentially affecting the way they provide care to obese patients.

4.3. Practice implications

These findings suggest the need for development, dissemination and adoption of a standardized gold-standard curriculum to ensure that medical students graduate with a consistent and deep knowledge of the complex multifactorial contributors to obesity.

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References

1. Wright SM, Aronne LJ. Causes of obesity. Abdom Imaging. 2012; 37(5):730–2. [PubMed: 22426851]
2. Skelton JA, et al. Obesity and its therapy: from genes to community action. Pediatr Clin North Am. 2006; 53(4):777–94. [PubMed: 16873005]
3. Ogden J, et al. General practitioners' and patients' models of obesity: whose problem is it? Patient Educ. Couns. 2001; 44(3):227–33.
4. Foster GD, et al. Primary care physicians' attitudes about obesity and its treatment. Obes Res. 2003; 11(10):1168–77. [PubMed: 14569041]
5. Pollak KI, et al. Physician communication techniques and weight loss in adults: project CHAT. Am J Prev Med. 2010; 39(4):321–8. [PubMed: 20837282]
6. Melin I, Rossner S. Practical clinical behavioral treatment of obesity. Patient Educ Couns. 2003; 49(1):75–83. [PubMed: 12527156]
7. Cox ME, et al. Effects of counseling techniques on patients' weight-related attitudes and behaviors in a primary care clinic. Patient Educ Couns. 2011; 85(3):363–8. [PubMed: 21316897]
8. Dansinger ML, et al. Meta-analysis: the effect of dietary counseling for weight loss. Ann Intern Med. 2007; 147(1):41–50. [PubMed: 17606960]
9. Huang J, et al. Physicians' weight loss counseling in two public hospital primary care clinics. Acad Med. 2004; 79(2):156–61. [PubMed: 14744717]
10. Bleich SN, Pickett-Blakely O, Cooper LA. Physician practice patterns of obesity diagnosis and weight-related counseling. Patient Educ Couns. 2011; 82(1):123–9. [PubMed: 20303691]
11. Moyer VA. Preventive Services Task Force US. Screening for and management of obesity in adults: U.S. Preventive Services Task Force Recommendation. Ann Intern Med. 2012; 157(5): 373–8. [PubMed: 22733087]
12. Lewis RJ, et al. Prejudice toward fat people: the development and validation of the antifat attitudes test. Obes Res. 1997; 5(4):297–307. [PubMed: 9285835]
13. O'Brien KS, et al. Reducing anti-fat prejudice in preservice health students: a randomized trial. Obesity (silver Spring). 2010; 18(11):2138–44. [PubMed: 20395952]

14. Gudzune KA, et al. Perceived judgment about weight can negatively influence weight loss: a cross-sectional study of overweight and obese patients. Prev Med. 2014; 62:103–7. [PubMed: 24521530]

15. Phelan SM, et al. Implicit and explicit weight bias in a national sample of 4732 medical students: the medical student CHANGES study. Obesity. 2013; 22(4):1201–8. [PubMed: 24375989]

16. Puhl RM, Luedicke J, Grilo CM. Obesity bias in training: attitudes, beliefs, and observations among advanced trainees in professional health disciplines. Obesity. 2014; 22:1008–15. [PubMed: 24124078]

Table 1

Distribution of beliefs about the importance of individual factors that contribute to obesity in a 2013 sample of 1244 4th year medical students in 50 U.S. medical schools.

	Score[a]		Importance									
			Not at all		Somewhat		Moderately		Very		Extremely	
	Mean	SD	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Overeating	4.4	.7	0	0	19	2	132	10	464	36	661	52
Physical inactivity	4.4	.8	0	0	31	2	127	10	475	37	642	50
Poor nutritional knowledge	4.0	.9	5	1	83	7	226	18	510	40	450	35
High fat diet	3.8	1.1	23	2	160	13	274	22	454	36	364	29
Genetic factors	3.5	1.0	11	1	198	16	415	33	445	35	206	16
Psychological problems	3.3	1.0	11	9	512	40	417	33	186	15	42	3
Marketing/advertising of unhealthy foods	3.2	1.1	71	6	323	25	361	28	348	27	172	14
Endocrine disorder	3.0	1.1	54	4	425	33	384	30	279	22	133	10
Restaurant eating	2.9	1.0	91	7	395	31	402	32	302	24	84	7
Food addiction	2.9	1.1	99	8	403	32	373	29	292	23	107	8
Metabolic defect	2.9	1.1	68	5	468	37	371	29	258	20	109	9
Lack of willpower	2.8	1.1	121	10	450	35	367	29	250	20	86	7
Repeated dieting (weight cycling)	2.6	1.0	118	9	512	40	417	33	186	15	42	3

[a]Measured on a 1 (Not at all)–5 (Extremely) scale.

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Table 2

Latent clsasses, overall probabilities, and conditional probabilities of endorsing individual contributors to obesity as moderately to extremely important in a 2013 sample of 1244 4th year medical students from 50 U.S. medical schools.

% Of sample	Probabilities				
	Overall 100%	**Class 1: multi-cause 28%**	**Class 2: physiological 27%**	**Class 3: behavioral/social 23%**	**Class 4: energy balance 22%**
Non-behavioral causes					
Genetic factors	83%	98% ↑	89% ↑	74% ↓	69% ↓
Psychological problems	76%	99% ↑	71%	92% ↑	39% ↓
Marketing/advertising of unhealthy foods	69%	94% ↑	55% ↓	82% ↑	43% ↓
Endocrine disorder	62%	100% ↑	98% ↑	19% ↓	16% ↓
Food addiction	60%	94% ↑	57%	66%	19% ↓
Metabolic defect	57%	100% ↑	94% ↑	12% ↓	9% ↓
Behavioral causes					
Overeating	98%	100%	98%	99%	97%
Physical inactivity	97%	100%	96%	97%	97%
Poor nutritional knowledge	92%	100% ↑	92%	99% ↑	81% ↓
High fat diet	85%	94% ↑	87%	84%	76% ↓
Restaurant eating	61%	93% ↑	35% ↓	79% ↑	39% ↓
Lack of willpower	55%	82% ↑	41% ↓	55%	38% ↓
Repeated dieting (weight cycling)	50%	92% ↑	30% ↓	65% ↑	10% ↓

↑/↓ Arrows indicate conditional probability more than 5% greater/less than overall sample probability.