

Current Knowledge of Obesity Treatment Guidelines by Health Care Professionals

Monique Turner, Nichole Jannah , Scott Kahan, Christine Gallagher, and William Dietz

Objective: The objective of this study was to assess health care professionals' knowledge of evidence-based guidelines for the nonsurgical treatment of obesity.

Methods: A nationally representative sample of internists, family practitioners, obstetricians/gynecologists, and nurse practitioners completed a web-based survey between June 9 and July 1, 2016 ($n = 1,506$).

Results: Only 16% of respondents indicated that obesity counseling should be provided approximately twice monthly in an individual or group setting for at least 6 months, in accordance with United States Preventive Services Task Force and Centers for Medicare and Medicaid Services guidelines. Only 15% of respondents identified $\text{BMI} \geq 27 \text{ kg/m}^2$ with an obesity-associated comorbid condition as the appropriate indication to prescribe pharmacotherapy for patients. Two-thirds of respondents indicated that it is appropriate to continue long-term pharmacotherapy under conditions inconsistent with evidence-based guidelines, with nearly one-quarter indicating that obesity medications should never be prescribed beyond 3 months regardless of weight loss.

Conclusions: These findings suggest that provider understanding of appropriate clinical care for obesity is inconsistent with evidence-based recommendations. As coverage for behavioral counseling services and pharmacotherapy expands, it is imperative that health care professionals understand how to effectively leverage these treatment modalities to optimize health outcomes for patients with obesity.

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Introduction

Adults with obesity ($\text{BMI} \geq 30 \text{ kg/m}^2$) incur 42% higher medical costs per capita and are nearly two times more likely to die before age 70 than adults with a healthy weight (1,2). Health care providers (HCPs) play a vital role in the prevention, treatment, and control of obesity. Evidence suggests that multicomponent behavioral interventions (intensive behavioral therapy [IBT]), pharmacotherapy, and bariatric surgery are all effective strategies that support clinically significant weight loss ($\geq 5\%$ reduction in body weight) for persons with obesity (3,4). Yet application of these evidence-based treatments is uncommon (5,6). Rates of IBT actually declined slightly between 1995 and 2008, despite the steady rise in obesity prevalence during this period, and remain low at present (7,8).

A previous survey found that 97% of HCPs believed they were partly or solely responsible for ensuring that patients were counseled on obesity (9). Persistently low rates of counseling are at odds with providers' self-proclaimed sense of responsibility for addressing obesity, suggesting that additional factors deter HCPs from addressing

weight with their patients. HCPs have cited lack of time, limited reimbursement, and lack of training as major barriers that prevent them from addressing obesity with their patients (9). When asked what would lead them to bring up obesity in conversation, 68% of HCPs indicated that an obesity-related risk factor would prompt discussion, while 57% indicated that they would wait for the patient to broach the topic.

Beyond behavioral counseling, recent data suggest that HCPs vary widely in their provision of pharmacotherapy and bariatric surgery for patients with obesity. In a survey of US providers, Petrin et al. (10) found that 31% of HCPs would not prescribe pharmacotherapy for obesity under any circumstances, with men and underweight providers more likely than women and providers at a healthy weight to indicate pharmacotherapy was an acceptable treatment modality. While 89% of HCPs were willing to refer patients for bariatric surgery, assuming no contraindications, less than one-third would refer at the guideline-recommended BMI threshold ($\text{BMI} \geq 40$ or $\text{BMI} \geq 35$ with a comorbid condition). Delayed or absent referrals

| Milken Institute School of Public Health, George Washington University, Washington, DC. Correspondence: Monique Turner (mmturner@gwu.edu)

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TABLE 1 Characteristics of participants organized by provider type

	Overall, N = 1,506	FPs, n = 480	Internists, n = 523	OB-GYNs, n = 250	NPs, n = 253
Gender (male)	907 (60)	314 (65)	410 (78)	31 (61)	907 (12)
Race/ethnicity					
White	1,028 (68)	325 (68)	294 (56)	211 (79)	1,028 (83)
Asian	305 (20)	103 (21)	160 (31)	12 (12)	305 (5)
Black	49 (3)	14 (3)	11 (2)	18 (2)	49 (7)
Two or more races	41 (3)	12 (3)	16 (3)	5 (3)	41 (2)
Other	83 (6)	26 (5)	42 (8)	7 (3)	83 (3)
Age (y)	47.5 ± 10.3	47.5 ± 10.3	48.0 ± 10.2	48.0 ± 10.2	46.1 ± 10.4
Years in practice	16.7 ± 8.8	16.7 ± 8.8	17.4 ± 8.8	17.4 ± 8.8	15.5 ± 8.6
<10	354 (24)	94 (20)	145 (28)	80 (14)	354 (32)
10-25	889 (59)	285 (59)	306 (59)	138 (64)	889 (55)
>25	263 (17)	101 (21)	72 (14)	35 (22)	263 (14)
Provider BMI (kg/m ²)	25.2 ± 3.9	25.2 ± 3.9	25.2 ± 4.0	25.2 ± 4.0	24.9 ± 3.5
Underweight (<18.5)	17 (1)	8 (2)	3 (1)	2 (2)	17 (1)
Healthy (18.5-25)	631 (42)	198 (41)	212 (41)	123 (39)	631 (49)
Overweight (25-29.9)	470 (31)	160 (33)	147 (28)	67 (38)	470 (26)
Obesity (≥30)	115 (8)	38 (8)	27 (5)	30 (8)	115 (12)
Not reported	273 (18)	76 (16)	134 (26)	31 (13)	273 (12)
Typical patient income					
<\$25,000	116 (8)	32 (7)	32 (6)	37 (6)	116 (15)
\$25,000-\$49,999	369 (25)	124 (26)	107 (20)	69 (28)	369 (27)
\$50,000-\$99,999	525 (35)	167 (35)	199 (38)	64 (38)	525 (25)
\$100,000-\$249,999	353 (23)	123 (26)	113 (22)	77 (16)	353 (30)
≥\$250,000	143 (9)	34 (7)	72 (14)	6 (12)	143 (2)
Practice type					
Individual outpatient	313 (21)	106 (22)	96 (18)	49 (25)	313 (19)
Group outpatient	976 (65)	355 (74)	297 (57)	152 (69)	976 (60)
Inpatient	217 (14)	19 (4)	130 (25)	52 (6)	217 (21)
Practice size (number of HCPs)	17.9 ± 54.3	17.9 ± 54.3	15.9 ± 54.9	15.9 ± 54.9	22.4 ± 60.4
Patient volume (patients/wk)	107.0 ± 76.9	107.0 ± 76.9	116.5 ± 76.7	116.5 ± 76.7	116.4 ± 86.1
Pediatric patients (yes)	1,018 (68)	446 (93)	208 (40)	139 (90)	1,018 (55)

Numbers are N (%) or mean ± SD.
FPs, family practitioners; OB-GYNs, obstetricians/gynecologists; NPs, nurse practitioners.

impair access to evidence-based bariatric procedures, which may be the most effective treatment for patients with severe obesity who are not able to achieve or maintain substantial weight loss through non-surgical interventions (11).

Although Petrin et al. (9,10) provided information on obesity-related attitudes and treatment practices across provider types, the predictors of such attitudes and practices remain unclear. One possible explanation is that HCPs lack adequate knowledge of the current guidelines for clinical obesity management. Thus, we are making a critical distinction between attitudes (and beliefs) and knowledge levels. Whereas attitudes and beliefs about what constitutes appropriate obesity management are subjectively held constructs based in culture and norms, knowledge is a more objective measure of a provider's theoretical or practical understanding of the topic derived from didactic education. In this study, we assessed knowledge of nonsurgical obesity treatment guidelines among family practitioners (FPs),

internists, obstetricians/gynecologists (OB-GYNs), and nurse practitioners (NPs) (3,4,12).

Methods

Data were collected in June 2016 using DocStyles, a web-based survey administered to a panel of 1,506 verified HCPs. In concert with Porter Novelli, a public relations firm specializing in health and social marketing, we designed obesity-specific questions for inclusion in the survey. The national sample used for analysis was randomly drawn from SERMO'S Global Medical Panel, which includes more than 330,000 medical professionals in the United States. The sample included 1,003 primary care physicians (480 FPs and 523 internists), 250 OB-GYNs, and 253 NPs. Participants were screened to include only those who practice in the United States, actively see adult patients, and have been practicing for at least 3 years. HCPs serving only pediatric patients were

TABLE 2 Survey responses consistent with evidence-based guidelines, by provider type

	Overall, N (%)	FPs, n (%)	Internists, n (%)	OB-GYNs, n (%)	NPs, n (%)
According to NHLBI guidelines, which of the eating patterns for weight loss is recommended for patients with overweight or obesity? ^a					
Any of the above options	497 (33)	170 (35)	154 (29)	90 (36)	83 (33)
Which of the following counseling options is recommended for patients with obesity? ^b					
Twice-monthly, individual/group counseling for ≥ 6 months	237 (16)	89 (19)	69 (13)	36 (14)	43 (17)
According to the National Physical Activity Guidelines, which of the following physical activity goals is recommended as the minimal level of physical activity to achieve substantial health benefits?					
At least 150 min/wk of moderate activity	742 (49)	251 (52)	235 (45)	122 (49)	134 (53)
At which of the following BMI thresholds is it most appropriate to prescribe FDA-approved medications for obesity in patients with at least one obesity-associated comorbid condition who have been unable to successfully lose weight and maintain weight loss?*					
Patients with a BMI ≥ 27	222 (15)	92 (19)	86 (16)	21 (8)	23 (9)
When is it most appropriate to continue to prescribe an FDA-approved medication for obesity for long-term use (i.e., beyond a few months), assuming there are no safety reasons to discontinue?*					
Patient loses ≥5% of body weight in initial 3 months of use	534 (35)	189 (39)	187 (36)	84 (34)	74 (29)

^aP < 0.01.

^bP < 0.001.

FPs, family practitioners; OB-GYNs, obstetricians/gynecologists; NPs, nurse practitioners.

excluded from participation. Respondents were paid an honorarium of \$21 to \$90 upon completion of the survey.

The full DocStyles panel contained 144 questions designed to provide insight into HCPs' attitudes and counseling behaviors on a variety of health issues. The present analysis examined responses to five questions designed to assess participants' understanding of obesity treatment guidelines in the context of various HCP characteristics (gender, race, age, height, weight, type and practice setting, average income of patients served, and years in practice). Self-reported height and weight data were used to calculate each respondent's BMI. Participants were asked questions to assess their knowledge of guidelines regarding the recommended minimum level of physical activity, the recommended duration and intensity of weight loss counseling, appropriate eating patterns for weight loss, the appropriate threshold to prescribe weight loss medications, and when it is appropriate to prescribe weight loss medications long term (Table 1).

χ^2 tests, odds ratios (OR), and generalized linear models were used to assess differences in provider responses by specialty, BMI, gender, years in practice, and typical household income of patients seen.

Results

The overall response rate for the survey was 64.5%. Table 1 summarizes respondent demographic characteristics. After controlling for demographic variables (e.g., age, patient volume, practice setting), HCP knowledge of clinical guidelines for physical activity, behavioral counseling, and pharmacotherapy varied significantly by provider type and years in practice (Table 2). Overall, HCPs were most knowledgeable of the physical activity guidelines (49% correct). HCPs were least likely to identify evidence-based guidelines when selecting the recommended intensity of obesity counseling (15% correct).

Only two providers (0.1%) selected responses consistent with evidence-based recommendations from all five guidelines assessed

by the survey. Most participants (84%) failed to identify practices consistent with evidence-based obesity treatment guidelines for the majority of questions (≥ 3 incorrect). The average number of guideline-aligned responses varied significantly by provider type and was highest among FPs ($M = 1.65$, 95% CI: 1.53-1.77) and lowest among internists ($M = 1.40$, 95% CI: 1.28-1.51) after controlling for years in practice. FPs were significantly more likely than internists, NPs, and OB-GYNs to identify the correct guidelines for obesity counseling and pharmacotherapy (Figure 1).

F1

Eating patterns for weight loss

Overall, 33% of HCPs correctly identified the NHLBI guideline that indicates any eating pattern suitable for the patient can be

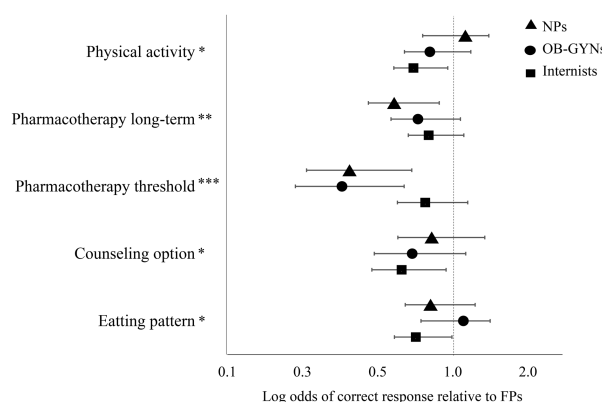


Figure 1 Influence of provider type on the odds of identifying correct guidelines for clinical weight management. Odds ratios > 1 indicate an increase, and odds ratios < 1 indicate a decrease in the odds of nurse practitioners (NPs), obstetricians/gynecologists (OB-GYNs), and internists identifying the correct weight management guidelines relative to family practitioners. The x-axis is on a logarithmic scale; error bars represent 95% confidence intervals. ***P < 0.001; **P < 0.01; *P < 0.05.

T1

T2

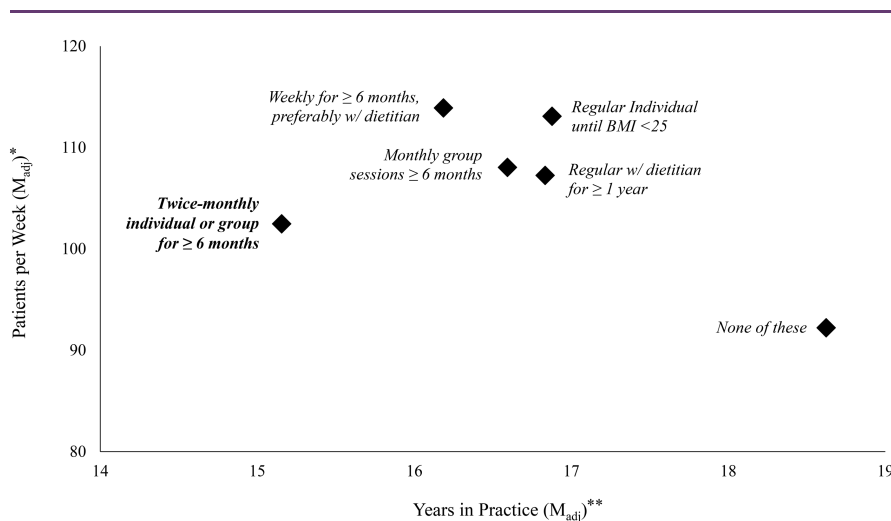


Figure 2 Knowledge of obesity counseling guideline by years in practice and patient volume. Responses varied significantly by years in practice (** $P \leq 0.01$) and patient volume ($P \leq 0.05$); adjusted means (M_{adj}) were obtained from analysis of covariance, controlling for age, gender, practice setting, practice size, and typical income of patients seen. Providers with fewer years in practice and a lower patient volume were most likely to correctly identify the guideline-recommended counseling option as twice-monthly individual or group counseling for at least 6 months (3,4).

recommended for weight loss (4). When data were stratified by provider type, responses varied significantly by BMI category for NPs, OB-GYNs, and internists. NPs with a healthy weight were four times more likely than NPs with obesity to indicate that any eating pattern can be recommended for weight loss (OR = 4.30, 95% CI: 1.41-13.10). Internists with obesity were four times more likely than internists at a healthy weight to indicate that dieting results in weight regain and should not be used (OR = 4.35, 95% CI: 1.01-20.00).

Intensive behavioral therapy

Fewer than 20% of providers recommended the counseling option consistent with United States Preventive Services Task Force guidelines (3). FPs (19%) and NPs (17%) were most likely to identify the correct counseling guideline. Among respondents who selected incorrectly, NPs were significantly more likely than FPs to select options that specified counseling provided by a dietitian (OR = 2.08, 95% CI: 1.54-2.86) (Supporting Information Table S1). Collectively, physicians (14%) were significantly more likely than NPs (5%) to indicate that no counseling option is recommended for patients with obesity (OR = 3.06, 95% CI: 1.71-5.46). Responses varied significantly by years in practice and patient volume (Figure 2).

Physical activity

About half (49%) of providers correctly identified that 150 minutes of moderate-intensity physical activity per week is the guideline-recommended minimum level of physical activity to achieve substantial health benefits (13). NPs (53%) and FPs (52%) were most likely to identify the correct guideline, but responses did not vary significantly by provider type. Of providers identifying an incorrect guideline, 25% selected a level of physical activity higher than the recommended minimum (e.g., longer duration, higher intensity), and

20% selected a level lower than the recommended minimum (e.g. shorter duration).

Pharmacotherapy for obesity

Only 8% of HCPs correctly identified the guideline-recommended thresholds to initiate and continue pharmacotherapy for obesity (Figure 3) (12). Seventy-seven percent of HCPs selected a prescribing threshold higher than recommended for patients with an obesity-associated comorbidity, and 26% indicated long-term pharmacotherapy only for patients achieving at least 10% to 15% reduction in body weight. FPs (19%) and internists (16%) were significantly more likely than NPs and OB-GYNs to identify prescribing practices consistent with evidence-based guidelines (OR = 2.25, 95% CI: 1.59-3.19). While only 4% of HCPs in this study indicated that obesity medications should never be prescribed, one in five respondents indicated that long-term pharmacotherapy is unsafe.

Discussion

This study is the first from a large, randomly selected sample of active HCPs to confirm that 1) HCP knowledge of physical activity and dietary guidelines is limited and 2) HCP understanding of the appropriate initiation, intensity, and duration for provision of IBT and pharmacotherapy is often inconsistent with evidence-based guidelines. These results complement findings from previous analyses of HCP self-reported behaviors (5,14), particularly prescribing behavior for obesity pharmacotherapy (Table 3). Our findings indicate that significant gaps in HCP knowledge of evidence-based guidelines for obesity management may underlie low rates (15) of IBT and pharmacotherapy for patients with obesity.

Unlike previous surveys (5,7,9,10,16,17), the questions used in this analysis were designed to assess HCP knowledge of various

F2

F3

T3

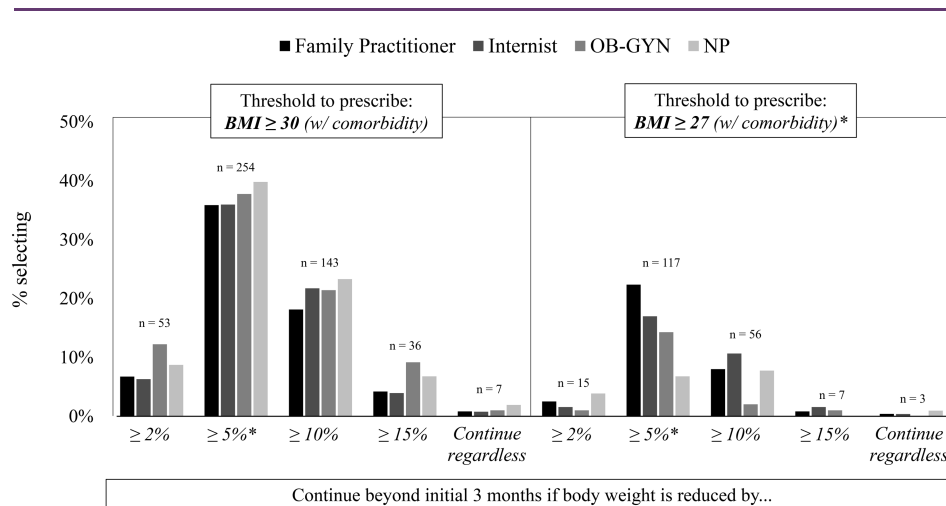


Figure 3 Variation in understanding of pharmacotherapy guidelines by provider type. Percentages are based on the 237 family practitioners, 253 internists, 98 obstetricians/gynecologists (OB-GYNs), and 83 nurse practitioners (NPs) who selected either BMI ≥ 27 with comorbidity or BMI ≥ 30 with comorbidity as the appropriate threshold to initiate pharmacotherapy; respondents indicating other prescribing thresholds are not represented in this figure. An asterisk (*) indicates prescribing practice consistent with current pharmacotherapy guidelines (12).

evidence-based obesity treatment guidelines rather than their attitudes or behaviors. Because knowledge of obesity management is not routinely assessed by medical licensing exams (18), this analysis provides unique information on where knowledge is most lacking and how understanding of IBT and pharmacotherapy guidelines differs for FPs, internists, OB-GYNs, and NPs. As an assessment of current HCP knowledge, our findings fill an important evidence gap in recent efforts to explain why widespread provider beliefs about

the importance of addressing obesity (9) seldom translate into provision of evidence-based treatments in clinical practice (10).

Differences in baseline training in obesity management and postgraduate clinical experiences may account for some of the observed variation in knowledge across provider groups. Unfortunately, comparable national data on profession- and specialty-specific training requirements for obesity management are scarce (6,19). The greater

TABLE 3 Comparison of HCPs' self-reported prescribing behavior with knowledge of guideline-recommended BMI threshold for pharmacotherapy

	What is typically your minimum requirement for prescribing drug therapy for obesity treatment? ^a				At which BMI threshold is it most appropriate to prescribe FDA-approved medications for obesity in patients with an obesity-associated comorbidity?			
	Overall	PCPs	OB-GYNs	NPs	Overall	PCPs ^b	OB-GYNs	NPs
Sample size, <i>n</i>	1,037	780	132	125	1,506	1,003	250	25
BMI ≥ 24 with comorbidity	–	–	–	–	2%	2%	1%	2%
BMI ≥ 27 with comorbidity ^c	–	–	–	–	15%	18%	8%	9%
BMI ≥ 30 ^c	25%	24%	34%	22%	–	–	–	–
BMI ≥ 30 with comorbidity	33%	33%	28%	36%	43%	42%	46%	46%
BMI ≥ 35	10%	10%	11%	10%	–	–	–	–
BMI ≥ 35 with comorbidity	23%	23%	17%	20%	34%	32%	40%	36%
BMI ≥ 40	6%	6%	8%	6%	–	–	–	–
None of these	3%	3%	2%	6%	2%	2%	2%	2%
Medications should not be used	–	–	–	–	4%	4%	3%	6%

^aQuestion fielded on 2015 DocStyles survey [10]; totals exclude HCPs indicating that they do not prescribe drug therapy for obesity.

^bResponses from family practitioners and internists (PCPs) are grouped for comparability to 2015 analysis in which they were combined.

^cIndicates guideline-recommended BMI threshold for pharmacotherapy [12].

OB-GYNs, obstetricians/gynecologists; NPs, nurse practitioners; PCP, primary care physician.

knowledge of obesity treatment guidelines demonstrated by FPs relative to internists and OB-GYNs in this analysis aligns well with a recent study of Ohio residency programs that found FPs received significantly more hours of didactic training related to obesity, physical activity, and nutrition than internists or OB-GYNs (20). Supporting the link between poor understanding of evidence-based guidelines and clinical practice, a national review of patient encounters found that OB-GYNs were the main source of preventive care for more than one-third of nonpregnant women, but they were less likely than FPs to provide obesity counseling (21) and seldom prescribed pharmacotherapy (22). Similarly low rates of pharmacotherapy were reported by NPs (9), although this is partly explained by inconsistent scope of practice laws governing prescriptive authority at the state level.

Importantly, previous DocStyles analyses have found that both OB-GYNs and NPs were significantly more likely than FPs and internists to indicate that additional training in obesity management would improve their ability to counsel patients with obesity (9,10). Although results from the present analysis suggest that all provider types will benefit from enhanced graduate and postgraduate learning opportunities in obesity management, the additional training may be particularly well received by OB-GYNs and NPs, who are increasingly called upon to deliver comprehensive primary care services for US adults. Furthermore, system-wide changes in education and reimbursement policy over the past several decades may explain some of the within-group response variation observed by years in practice. For example, the recent expansion of Medicare reimbursement for IBT (23) may partly explain why providers who entered practice within the past 10 years were more likely to recommend the IBT option consistent with Centers for Medicare and Medicaid Services guidelines.

It is also possible that individual differences in weight bias contributed to the substantial within-group response variation in this analysis. Weight bias can be both a mediator and product of inadequate knowledge and training on obesity (24), making its effects particularly difficult to parse (25). Our finding that one-third of HCPs would delay pharmacotherapy until BMI ≥ 35 , even in the presence of a comorbid condition, might be evidence that many HCPs still perceive obesity as a disease of willpower that can be ameliorated simply by eating less and exercising more—an antiquated mantra rooted in weight bias. Yet HCPs who recommended initiation of pharmacotherapy at BMI ≥ 35 were also four times more likely than HCPs who recommended initiation at BMI ≥ 27 to indicate that FDA-approved medications for obesity are unsafe for long-term use. Together, these findings suggest that weight bias and misinformation about the safety and efficacy of obesity medications approved for long-term use may work synergistically to deter HCPs from utilizing effective pharmacotherapies in accordance with evidence-based guidelines (12).

Limitations

Although this analysis includes responses from a large, nationally representative sample of active US HCPs, it has several limitations. The survey did not capture responses from several important provider types, including physician assistants, and the findings may not be generalizable to all US HCPs. Although participants were randomly selected, inclusion in the SERMO medical panel from which participants were drawn is inherently prone to selection bias. Based on unpublished demographic data from previously conducted surveys, it is also possible that a small number of respondents included in this analysis had prior specialty training in obesity management. While we did not assess the number or distribution of obesity specialists across

HCP groups, a concentration of obesity specialists within subsamples could explain some of the intergroup variation in responses. Furthermore, the DocStyles survey instrument has not been formally tested for reliability or validity. Any psychometric assessment is subject to nonsampling errors, including specification error, measurement error, and random response error. Although questions and answer choices were designed to minimize response bias, we did not control for differential interpretations of questions or other sources of error that may have influenced responses. Thus, it is possible that the results do not accurately reflect knowledge of obesity treatment guidelines for some respondents.

Implications

Our findings offer insight on HCPs' familiarity with the clinical guidelines for provision of evidence-based obesity treatment modalities, but the survey did not directly assess the effect of provider knowledge on provision of counseling and pharmacotherapy services. Assuming HCPs provide treatment according to their knowledge of evidence-based guidelines, our data suggest that HCPs are waiting too long to initiate treatment and maintaining unrealistic outcome expectations for initial weight loss when they do. Additional research is needed to clarify the extent to which improving HCP knowledge of clinical guidelines for obesity management will improve quality of care and population health outcomes. Furthermore, the impact of pervasive weight stigma on HCP understanding of ideal approaches to obesity management should not be discounted when considering systematic drivers of suboptimal or absent obesity care.

Implementation of the recently released HCP competencies for the prevention and treatment of obesity (26), tools to facilitate improved clinical decision-making, and standardized reimbursement policies could bolster HCPs' self-efficacy and increase provision of effective services that improve health outcomes for patients with obesity (27). Given the multitude of distinct but overlapping obesity management guidelines currently in existence (4,12,28), synthesis of a practical, unified standard of care may help knowledgeable HCPs to successfully implement evidence-based obesity care in a variety of settings.

Conclusion

These findings indicate that HCP understanding of appropriate clinical care for obesity is inconsistent with evidence-based recommendations. Our data suggest that limited understanding of when and how to deliver evidence-based treatments likely deters HCPs from addressing obesity with their patients. As coverage for behavioral counseling services and pharmacotherapy expands, it is imperative that health professional training programs better prepare HCPs to leverage evidence-based treatment modalities that can optimize health outcomes for patients with obesity. **O**

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References

1. Finkelstein E, Trogdon J, Cohen J, Dietz W. Annual medical spending attributable to obesity: payer- and service-specific estimates. *Health Aff* 2009;28:822-831.
2. Peeters A, Barendregt JJ, Willekens F, Mackenbach JP, Al Mamun A, Bonneux L. Obesity in adulthood and its consequences for life expectancy: a life-table analysis. *Ann Intern Med* 2003;138:24-32.
3. Obesity in Adults: Screening and Management. US Preventive Services Task Force website. <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/obesity>

- ty-in-adults-screening-and-management. Updated September 2016. Accessed August 10, 2017.
4. Jensen MD, Ryan DH, Donato KA, et al. Guidelines (2013) for managing overweight and obesity in adults. *Obesity (Silver Spring)* 2014;22(Suppl 2):S1-S410.
 5. Bleich SN, Bandara S, Bennett WL, Cooper LA, Gudzone KA. U.S. health professionals' views on obesity care, training, and self-efficacy. *Am J Prev Med* 2015; 48:411-418.
 6. Dietz WH, Baur LA, Hall K, et al. Management of obesity: improvement of health-care training and systems for prevention and care. *Lancet* 2015;385:2521-2533.
 7. Batsis JA, Bynum JPW. Uptake of the Centers for Medicare and Medicaid Obesity Benefit: 2012–2013. *Obesity (Silver Spring)* 2016;24:1983-1988.
 8. Estimating the effects of federal policies targeting obesity: challenges and research needs. Congressional Budget Office website. <https://www.cbo.gov/publication/50877>. Published October 26, 2015. Accessed August 10, 2017.
 9. Petrin C, Kahan S, Turner M, Gallagher C, Dietz WH. Current attitudes and practices of obesity counselling by health care providers. *Obes Res Clin Pract* 2017;11:352-359.
 10. Petrin C, Kahan S, Turner M, Gallagher C, Dietz WH. Current practices of obesity pharmacotherapy, bariatric surgery referral and coding for counselling by healthcare professionals. *Obes Sci Pract* 2016;2:266-271.
 11. Kushner RF. Weight loss strategies for treatment of obesity. *Prog Cardiovasc Dis* 2014;56:465-472.
 12. Apovian CM, Aronne LJ, Bessesen DH, et al. Pharmacological management of obesity: an endocrine society clinical practice guideline. *J Clin Endocrinol Metab* 2015;100:342-362.
 13. Physical Activity Guidelines Advisory Committee; US Department of Health and Human Services. *Physical Activity Guidelines for Americans*. Washington, DC: US Department of Health and Human Services. 2008:15-34.
 14. Ard J. Obesity in the US: what is the best role for primary care? *BMJ* 2015;350: g7846. doi:10.1136/bmj.g7846
 15. Kraschnewski JL, Sciamanna CN, Stuckey HL, et al. A silent response to the obesity epidemic: decline in US physician weight counseling. *Med Care* 2013;51: 186-192.
 16. Breitkopf CR, Egginton JS, Naessens JM, Montori VM, Jatoti A. Who is counseled to lose weight? Survey results and anthropometric data from 3,149 lower socioeconomic women. *J Community Health* 2012;37:202-207.
 17. Koball AM, Mueller PS, Craner J, et al. Crucial conversations about weight management with healthcare providers: patients' perspectives and experiences. *Eat Weight Disord* 2018;23:87-94.
 18. Kushner RF, Butsch WS, Kahan S, Machineni S, Cook S, Aronne LJ. Obesity coverage on medical licensing examinations in the United States. What is being tested? *Teach Learn Med* 2017;29:123-128.
 19. Vitolins MZ, Crandall S, Miller D, Ip E, Marion G, Spangler JG. Obesity educational interventions in U.S. medical schools: a systematic review and identified gaps. *Teach Learn Med* 2012;24:267-272.
 20. Antognoli EL, Seeholzer EL, Gullett H, Jackson B, Smith S, Flocke SA. Primary care resident training for obesity, nutrition, and physical activity counseling: a mixed-methods study. *Health Promot Pract* 2017;18:672-680.
 21. Stormo AR, Saraiya M, Hing E, Henderson JT, Sawaya GF. Women's clinical preventive services in the United States: who is doing what? *JAMA Intern Med* 2014;174:1512-1514.
 22. Thomas CE, Mauer EA, Shukla AP, Rathi S, Aronne LJ. Low adoption of weight loss medications: a comparison of prescribing patterns of antiobesity pharmacotherapies and SGLT2s. *Obesity (Silver Spring)* 2016;24:1955-1961.
 23. Medicare Learning Network, Centers for Medicare and Medicaid Services. Intensive Behavioral Therapy (IBT) for Obesity. ICN 907800. Baltimore, MD: Centers for Medicare and Medicaid Services; 2012.
 24. O'Brien KS, Puhl RM, Latner JD, Mir AS, Hunter JA. Reducing anti-fat prejudice in preservice health students: a randomized trial. *Obesity (Silver Spring)* 2010;18: 2138-2144.
 25. Phelan SM, Dovidio JF, Puhl RM, et al. Implicit and explicit weight bias in a national sample of 4,732 medical students: the Medical Student CHANGES study. *Obesity (Silver Spring)* 2014;22:1201-1208.
 26. Bradley DW, Dietz WH; Provider Training and Education Workgroup. *Provider Competencies for the Prevention and Management of Obesity*. Washington, DC: Bipartisan Policy Center; 2017. <https://bipartisanpolicy.org/library/provider-competencies-for-the-prevention-and-management-of-obesity>.
 27. Apovian CM, Garvey WT, Ryan DH. Challenging obesity: patient, provider, and expert perspectives on the roles of available and emerging nonsurgical therapies. *Obesity (Silver Spring)* 2015;23(suppl 2):S1-S26.
 28. Garvey WT, Mechanick JI, Brett EM, et al. American Association of Clinical Endocrinologists and American College of Endocrinology comprehensive clinical practice guidelines for medical care of patients with obesity. *Endocr Pract* 2016; 22(suppl 3):1-203.