ORIGINAL RESEARCH

Primary Care Patients' Willingness to Participate in Comprehensive Weight Loss Programs: From the WWAMI Region Practice and Research Network

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Purpose: **In the United States, 69% of adults are overweight or obese, as defined by a body mass index (BMI) ≥25 kg/m^2. The US Preventive Services Task Force recommends screening all adult patients for obesity and referring obese patients to intensive, multicomponent behavioral weight loss programs comprising 12 to 26 yearly sessions. The objective of this study is to determine the degree to which overweight and obese primary care patients report willingness to participate in these intensive weight loss programs and to identify the patient factors associated with reported willingness to participate.**

Methods: **This 2013 cross-sectional survey was offered to all adult patients seen for an office visit at 1 of 12 primary care clinics in the Washington, Wyoming, Alaska, Montana and Idaho (WWAMI) Region Practice and Research Network (WPRN). Patients self-reported both their health information and their willingness to participate in a comprehensive weight loss program. Respondents were characterized by descriptive statistics. We compared reported rates of willingness to participate by patient factors and assessed which patient factors were independently associated with reported willingness using bivariate analysis and logistic regression, respectively.**

Results: **Of overweight and obese respondents, 63% reported willingness to participate in comprehensive weight loss programs. Age, sex, race/ethnicity, insurance status, BMI, and reason for wanting to lose weight were all significantly and independently associated with reported willingness to participate.**

Conclusions: **Reported willingness to participate in comprehensive weight loss programs suggests that additional resources are needed to understand strategies for disseminating and implementing effective comprehensive weight loss programs. (J Am Board Fam Med 2016;29:572–580.)**

Keywords: **Body Mass Index, Cross-Sectional Studies, Ethnic Groups, Evidence-based Medicine, Insurance Coverage, Obesity, Office Visits, Overweight, Practice-based Research, Primary Health Care, Self Report, Weight Reduction**

Among adults in the United States, there is a combined prevalence of overweight (body mass index [BMI] between 25 and 29.9 kg/m^2) and obesity (BMI ≥30 kg/m^2) of 69%.[1] Hispanic and African American populations have particularly high rates of overweight and obesity compared with non-His-

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panic white populations in the United States (78%, 76%, and 67%, respectively).[1,2]

Overweight and obesity are associated with increased risk of developing type 2 diabetes, lower health-related quality of life measures, and increased prevalence of chronic pain conditions and depression.[3–8] In primary care practice, the prevalence of multiple chronic conditions and the utilization of primary care are significantly higher among overweight and obese patients.[9,10]

Based on a large body of evidence from clinical trials, the US Preventive Services Task Force (USPSTF) recommends that primary care providers screen all adult patients for obesity based on BMI and that clinicians offer or refer obese patients to intensive, multicomponent behavioral interventions.[11] Multicomponent behavioral interventions (eg, improving nutrition and physical activity through behavioral strategies, addressing barriers to change, self-monitoring, and optimizing the maintenance of lifestyle changes) can lead to an average weight loss of 4 to 7 kg.[11,12] The most effective behavioral interventions are comprehensive and include 12 to 26 sessions in a year.[12–14] While USPSTF recommendations are limited to the referral of obese patients, there is evidence that overweight patients, especially those with chronic diseases, may also benefit from participation in weight loss programs.[15–17] The 2010 Patient Protection and Affordable Care Act mandates that health insurance companies cover, with no cost-sharing, obesity screening and counseling for adults and children, which has the potential to reduce financial barriers to participation in weight loss programs and increase the availability of these services.[18,19]

The objectives of this study are (1) to assess, in a diverse network of primary care practices, the degree to which overweight and obese adults report willingness to participate in a comprehensive weight loss program as recommended by the USPSTF, and (2) to determine the patient characteristics associated with reported willingness to participate. The results of this study can be used to guide the development and implementation of evidence-based weight loss programs in primary care practice.

Methods

Setting

This study was conducted in the Washington, Wyoming, Alaska, Montana, and Idaho (WWAMI) Region Practice and Research Network (WPRN), a network of >50 primary care practices across WWAMI. Twelve primary care practices across 5 states volunteered to participate.

Participants

All adult patients (aged ≥18 years) who presented for a primary care visit at 1 of the participating practices over a 2-week period were eligible to participate. Patients who were pregnant or unable to read English or Spanish were excluded.

Procedures

Eleven sites collected data in June 2013, and 1 collected data in September 2013. At each site, front desk staff were asked to offer all eligible patients a questionnaire and to request that they complete the questionnaire and return it to a closed collection box in the waiting area to ensure anonymity. The University of Washington's institutional review board reviewed this research protocol and designated it as exempt.

Questionnaire

The brief booklet-form questionnaire included a total of 14 multiple choice and fill-in-the-blank questions. The questionnaire asked for basic demographics and asked participants to report whether they wanted to lose weight right now (yes/no) and whether they thought their doctor would advise them to lose weight (yes/no). Participants were also asked to record the number 1 reason they wanted to lose weight right now and the number of pounds they wanted to lose.

Willingness to take part in a comprehensive weight loss program was assessed with participants' responses to the question, "Weight loss programs that work best have at least 12 visits (in groups or 1-on-1). These programs help you (1) improve your diet and exercise, (2) decide how much weight to lose, and (3) solve problems that get in your way of losing weight. If your town had a 12-visit weight loss program like this, would you take part in it?" The response options were (1) would not take part, (2) maybe would take part, (3) probably would take part, and (4) very likely would take part.

To identify potential facilitators and barriers to participation in a comprehensive weight loss program, we asked participants to mark the top 3 of 8 potential factors (will help me lose weight, will help me feel better, was recommended by a friend or family member, was recommended by my doctor,

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does not cost me much, is easy to get to, is at a convenient time of day, a friend would go with me) that would help them decide whether to participate.

Variables

Outcomes

The primary outcome was the proportion of patients who reported willingness to participate (very likely or probably would participate in a comprehensive weight loss program).

Descriptive Variables

Demographics included patients' self-reported sex, age, insurance status, and race/ethnicity. We categorized patients who reported >1 race as "multiple races," which is consistent with procedures used by the US Census Bureau.[20] Participants also self-reported insurance status. Two independent investigators categorized write-in responses to "other" for race/ethnicity and categorized insurance status into existing categories, if possible, or as "other." We grouped insurance categories by similarity (eg, mixed/likely Medicaid and Medicare/Medicaid were grouped with Medicaid) and recoded the remaining "other" insurance respondents as private insurance because private insurance represented the largest single category of respondents.

We used patient self-reported height and weight to calculate BMI using the standard formula (weight in pounds × 703)/(height in inches squared). We coded BMI into categories based on those used in clinical care (normal weight, 18.5 to <25 kg/m^2; overweight, 25–29.9 kg/m^2; obese, 30–39 kg/m^2; extremely obese, ≥40 kg/m^2).[21] Patients also self-reported their overall health status as excellent, very good, good, fair, or poor.

Two investigators independently reviewed the free-text responses patients wrote as reasons for wanting to lose weight and developed a set of codes that characterized the majority of responses (Table 1). Initial codes were grouped into related categories, creating 5 final categories: appearance, emotional/family, physical functioning, medical, and age. Each category was used as a separate variable (yes/no) in the analysis so that the relationships between each reason for weight loss and reported likelihood of participating could be assessed.

Table 1. Codes and Sample Quotes Based for Patients' "Number 1 Reason for Wanting to Lose Weight"

Original Code	Example Quote	Final Grouped Code
Health	"Overall my health"	Physical functioning
Medical	"Type 2 diabetes"	Medical
Energy	"More energy"	Physical functioning
Musculoskeletal	"Hip problems"	Medical
Clothes	"Cannot fit in my clothes"	Appearance
Feel better	"Feel better"	Physical functioning
Pain	"Lower pain level"	Medical
Fitness	"To be more fit"	Physical functioning
Emotional	"I want to feel better about myself"	Emotional/family
Family	"Play with kids"	Emotional/family
Longevity	"To live longer"	Age
Comfort	"Feel more comfortable"	Physical functioning
Look better	"Look more beautiful"	Appearance

Analysis

We completed dual data entry for all completed surveys into a Research Electronic Data Capture database.[22] In the analysis we included only patients who (1) answered that their doctor would advise them to lose weight and who wanted to lose weight right now, and (2) had a calculated BMI ≥25 kg/m^2. We conducted analyses using SAS software version 9.4 for Windows (SAS Institute Inc., Cary, NC).

We calculated the survey response rate by dividing the number of returned questionnaires by the total number of adult primary care visits during the study periods as reported by the 12 participating practices. We calculated descriptive statistics (proportions and standard deviations) for each variable and the primary outcomes.

To compare the proportion of respondents who reported willingness to participate by the different categories within each variable, we used the χ^2 test, with a significance level of $P < .05$, to denote differences. We sought to identify which patient characteristics were independently associated with reported willingness to participate in comprehensive weight loss programs. To identify these patient characteristics, we conducted a logistic regression analysis (1 = willing to participate vs 0 = not willing to participate). We used stepwise logistic regression with age, sex, and race/ethnicity included initially, and then we added additional de-

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scriptive variables (insurance status, BMI, and reported reason for weight loss) that were significantly associated with the primary outcome in the bivariate analysis or that significantly improved the fit of the model. A clinic identifier was included in the final regression model to adjust for clustering of patients by clinic. We converted odds ratios to relative risks (RRs).[23]

Results

We received 2832 questionnaires from the 12 participating practices (range, 35–817 per site). The response rate across all sites was 29%, with a range of 5% to 59%. We excluded 15 questionnaires because respondents reported their age as younger than 18 and excluded another 120 because participants did not answer enough questions to interpret the results. Of the remaining 2697 respondents, 1632 reported both that their doctor would advise them to lose weight and that they wanted to lose weight right now. We calculated the BMI of these respondents and excluded those who were underweight (n = 1) or normal weight (n = 192). We included overweight patients (BMI 25 to <30 kg/m^2) in our study because evidence suggests that, similar to obesity, overweight is associated with increased risk of chronic diseases such as diabetes, which can lead to lower health outcomes.[9,24] The sample size for variables varies from 1362 to 1439 because of differences in missing data for each variable.

The majority of respondents were female (74.3%); 32.7% of all respondents were aged ≥55 years (Table 2). Most respondents identified themselves as non-Hispanic white (71.6%), and 7.1% of respondents identified themselves as American Indian or Alaska native. Only 2.9% of respondents rated their overall health as excellent, whereas 42.3% rated their overall health as fair or poor. Of 1439 respondents reporting height and weight, 28.1% were overweight (BMI 25–29.9 kg/m^2), 51.5% were obese (BMI 30–39.9 kg/m^2), and 20.5% were extremely obese (BMI ≥40 kg/m^2).

We found that 63% of respondents (907 of 1439) reported willingness to participate in a comprehensive weight loss program as recommended by the USPSTF. Logistical factors such as cost, time of day, and location were commonly identified as important factors in helping people decide whether to participate (Table 3).

Table 2. Descriptive Characteristics of the Respondents

Characteristic	Respondents (N = 1479)
Age (years) (n = 1439)	
18–24	7.9
25–34	16.5
35–44	19.3
45–54	23.7
55–64	21.7
≥65	11.0
Sex (n = 1439)	
Male	25.7
Female	74.3
Race/ethnicity (n = 1413)	
Non-Hispanic white	71.6
Hispanic or Latino	7.2
Black or African American	3.7
Asian	2.3
Pacific Islander	1.2
American Indian/Alaska native	7.1
Some other race	1.2
Multiple	7.6
Insurance status (n = 1439)	
None	22.1
Private	21.1
Medicare	14.8
Medicaid	22.1
Military	20.0
Overall health (n = 1431)	
Excellent	2.9
Very good	18.0
Good	36.8
Fair	31.7
Poor	10.6
BMI (n = 1442)	
Overweight (25–29.9 kg/m^2)	28.1
Obese (30–39.9 kg/m^2)	51.5
Extremely obese (≥40 kg/m^2)	20.5
Reason for wanting to lose weight* (n = 1362)	
Appearance	9.9
Emotional/family	10.7
Physical functioning	23.0
Medical	74.6
Age	1.9

Data are percentages. The sample excludes individuals with missing data for the outcome variable (willingness to participate in comprehensive weight loss program). Sample size varies from 1362 to 1439 because of differences in missing data for each variable.
*Some respondents listed more than one reason for wanting to lose weight.
BMI, body mass index.

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Table 3. Factors That Respondents Reported Were Important in Helping Them Decide Whether to Take Part in a Comprehensive Weight Loss Program (n = 1479)

Factors	Responses (%)
Will help me lose weight	73.1
Will help me feel better	55.1
Doesn't cost me much	54.8
Is at a good time of day for me	34.0
Is easy to get to	25.7
Was recommended by my doctor	15.4
A friend would go with me to the program	9.6
Was recommended by a friend or family member	2.9

Respondents were asked to check the 3 items that are most important to them. The sample excludes individuals with missing data for the outcome variable (willingness to participate in comprehensive weight loss program).

In bivariate analysis, women were more likely than men to report willingness to participate (67.3% vs 50.8%; $P < .001$) (Table 4). Reported willingness to participate also significantly varied with BMI (58.8% for those with BMI 25–29.9 kg/m^2, 71.2% for those with BMI ≥40 kg/m^2; $P < .01$). Of respondents who reported an emotional reason for weight loss, 73.8% reported willingness to participate in a comprehensive weight loss program. Of respondents who reported a medical reason for weight loss, 65.5% reported willingness to participate.

In multivariate analysis (Table 5), women were more likely than men to report willingness to participate (RR, 1.18; 95% confidence interval [CI], 1.07–1.27), and African Americans/blacks (RR, 1.18; 95% CI, 1.05–1.29) and American Indian/Alaska natives (RR, 1.31; 95% CI, 1.07–1.45) were more likely to report willingness to participate compared with non-Hispanic whites. Compared with respondents with private insurance, respondents with Medicare insurance were less likely to report willingness to participate (RR, 0.83; 95% CI, 0.67–0.99). Reporting an emotional/family reason or reporting a medical reason for weight loss were both associated with an increased willingness to participate (RR, 1.17; 95% CI, 1.05–1.23 and RR, 1.12; 95% CI, 1.04–1.20, respectively) compared with those not reporting these reasons.

Discussion

We found that the majority of respondents reported willingness to participate in comprehensive weight loss programs. Ensuring widespread availability of these programs is 1 important step to improve obesity outcomes in the United States.[11,25] The Patient Protection and Affordable Care Act, which requires insurance companies to provide patients coverage for treatment of obesity, has taken 1 step toward this goal by reducing financial barriers to patient access to evidence-based weight loss treatments.[18,19] However, not all states have fully adopted insurance reimbursement for obesity treatment: in 2014, only 5 states required coverage of comprehensive weight loss programs as an essential health benefit.[26] Medicare only reimburses or pays for obesity counseling and treatment provided during in-person, face-to-face visits, further creating potential financial barriers for patient participation in weight loss programs.[27]

The coordinated infrastructure required to implement in-person comprehensive weight loss programs may serve as a barrier to health systems offering these successful programs. Thus it is imperative to consider alternative approaches to providing these programs, such as remote programs delivered through mobile and web support.[13,22] With the growing adoption of smartphones, testing the effectiveness of mobile health technology–enabled weight loss programs is important because these programs could also address our findings of patient-identified logistical barriers to participation, such as cost, location, and convenience.[28] These factors were also identified as potential barriers to weight loss program participation in a previous study.[29]

We found that only 15% of patients cited physician recommendation as an important factor in considering weight loss program participation. While most patients recognized that their physician would advise them to lose weight, our findings underscore the importance of further research to clarify the impact of physician recommendation on patient participation in weight loss programs. Physicians report discomfort with discussing obesity and weight loss with patients, and only a minority of obese adults report having received weight loss counseling from a physician.[30–35] Motivational interviewing, a counsel-

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Table 4. Reported Willingness to Participate in Comprehensive Weight Loss Program, by Descriptive Characteristics

Characteristics	Willing to Participate (%)
Overall (n = 1439)	63.0
Age (n = 1439) (P = .0073)	
18–24	76.1
25–34	67.5
35–44	63.3
45–54	62.5
55–64	57.4
≥65	58.9
Sex (n = 1439)*	
Male	50.8
Female	67.3
Race/ethnicity (n = 1413)*	
American Indian/Alaska native	67.7
Asian	75.8
Black or African American	80.8
Non-Hispanic white	59.3
Hispanic or Latino	74.3
Pacific Islander and other race	68.874.7
Multiple	
Insurance status (n = 1382) (P = .0012)	
None	65.6
Private	60.5
Medicare	54.4
Medicaid	71.6
Military	61.2
Overall health (n = 1431)	
Excellent	65.9
Very good	61.6
Good	61.9
Fair	66.1
Poor	60.3
BMI (n = 1442) (P = .0027)	
Overweight (BMI 25–29.9 kg/m^2)	58.8
Obese (BMI 30–39.9 kg/m^2)	62.1
Extremely obese (BMI ≥40 kg/m^2)	71.2
Reason for wanting to lose weight† (n = 1362)	
Appearance	
Reason listed	57.0
Reason not listed	64.5
Emotional/family (P = .0077)	
Reason listed	73.8
Reason not listed	62.5
Physical functioning	
Reason listed	62.3
Reason not listed	64.2
Medical (P = .0234)	
Reason listed	65.5
Reason not listed	58.7
Age	
Reason listed	76.9
Reason not listed	63.5

The sample excludes individuals with missing data for the outcome variable (willingness to participate in comprehensive weight loss program). Sample size varies from 1454 to 1545 because of differences in missing data for each variable.
*$P < .001$.
†Some respondents listed more than one reason for wanting to lose weight.
BMI, body mass index.

ing strategy that allows physicians to work collaboratively with patients to explore and resolve ambivalence related to behavior change, is effective in promoting weight loss.[36] Wider adoption of this practice may assist in helping physicians support patients' engagement in comprehensive weight loss programs.[37]

Individual factors, including sex, age, race/ethnicity, insurance status, and BMI, were all associated with reported willingness to participate in comprehensive weight loss programs. This is consistent with results from clinical trials of weight loss programs, which report differential participant participation and effectiveness based on sex and race/ethnicity.[38–41] Tailoring referral strategies and comprehensive weight loss programs to specific patient groups may be a useful approach for increasing participation in and the effectiveness of these programs.

We found that patients reported an increased willingness to participate if they cited medical and emotional reasons for weight loss. Physicians leverage patients' motivations to improve medical conditions to engage patients in weight loss programs. Both successful weight loss and maintenance of weight loss are associated with an internal motivation to lose weight.[42,43] Eliciting patient motivations for weight loss and customizing weight loss programs to patients' motivations may facilitate the successful implementation of weight loss programs in primary care.

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Table 5. Adjusted Relative Risk of Reported Willingness to Participate in a Comprehensive Weight Loss Program, by Patient Characteristics

Patient Characteristics	Relative Risk (95% CI)
Age (years)	
18–24	Reference
25–34	0.80 (0.64–0.95)
45–54	0.77 (0.67–0.87)
55–64	0.78 (0.65–0.91)
≥65	0.72 (0.56–0.89)
Sex	
Male	Reference
Female	1.18 (1.07–1.27)
Race/ethnicity	
Non-Hispanic white	Reference
African American/black	1.18 (1.05–1.29)
American Indian/Alaska native	1.31 (1.07–1.45)
Asian	1.30 (1.16–1.40)
Hispanic/Latino	1.07 (0.86–1.24)
Pacific Islander/other	1.12 (0.90–1.29)
Multiple races	1.21 (1.09–1.31)
Insurance	
Private	Reference
None	0.91 (0.80–1.01)
Medicare	0.83 (0.67–0.99)
Medicaid	1.05 (0.93–1.16)
Military	0.94 (0.86–1.22)
BMI	
Overweight (BMI 25–29.9 kg/m^2)	Reference
Obese (BMI 30–39.9 kg/m^2)	1.05 (0.95–1.14)
Extremely obese (BMI ≥40 kg/m^2)	1.17 (0.99–1.31)
Reasons for wanting to lose weight	
No emotional/family reason	Reference
Emotional/family reason	1.17 (1.05–1.23)
No medical reason	Reference
Medical reason	1.12 (1.04–1.20)

CI, confidence interval; BMI, body mass index.

Limitations

This study has several limitations. Self-reported height and weight were used to calculate BMI. Adults younger than 30, especially women, may be more likely to underestimate BMI by overestimating height and underestimating weight.[44] No information was recorded about nonrespondents, and it is possible that clinic staff were more likely to offer the survey to patients they thought would be interested in weight loss programs, potentially biasing our primary outcome toward reported willingness to participate. The majority of study participants were non-Hispanic white and may not be representative of more racially diverse populations. Despite these limitations, we collected and analyzed responses from more than 1500 questionnaires across 12 diverse primary care practices, with 30% of respondents identifying as nonwhite, improving the generalizability of our findings.

This brief questionnaire asked patients about likely participation in comprehensive weight loss programs, which may not directly correlate with actual participation. In a population-based study, 64% of adults (73% of women and 55% of men) reported a desire to lose weight,[45] which is similar to our findings of reported willingness to participate in weight loss programs. Yet, only 48% of overweight or obese adults report having pursued weight loss in the previous year.[45] In a large study of patients in a health maintenance organization, only 2.5% of invited overweight and obese patients participated in an in-person comprehensive weight loss program. Thus rates of program participation may be lower than what respondents reported in this study.[46] The USPSTF recommendations for comprehensive weight loss programs highlight the need for research to understand effective strategies for dissemination and implementation of these programs.[11] This research would provide evidence-based pragmatic approaches to increase participation in comprehensive weight loss programs among primary care patients.

Conclusion

The majority of respondents reported willingness to participate in a comprehensive weight loss program. Delivering programs in ways that address frequently cited barriers to participation, such as cost and convenience, and tailoring recruitment strategies to individual patient characteristics such as sex, race/ethnicity, and BMI, are an important step in addressing the significant problem of overweight and obesity.

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