

Building a Viable Weight Management Program in a Patient-Centered Medical Home

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BACKGROUND AND OBJECTIVES: The growing prevalence of obesity in the United States and globally highlights the need for innovative strategies to provide obesity treatment in primary care settings. This report describes and evaluates the Weight Management Program (WMP), an interprofessional program in an academic family medicine clinic delivering intensive behavioral therapy (IBT) following evidenced-based guidelines.

METHODS: We extracted WMP participant health data from the electronic health record and evaluated retrospectively. Eligible participants completed at least four WMP visits and had a baseline weight, blood pressure, and hemoglobin A_{1c} (HbA_{1c}) recorded within 1 year prior to their first visit. Paired *t* tests were used to assess changes in, weight, HbA_{1c} and systolic and diastolic blood pressures from baseline.

RESULTS: WMP counseled 673 patients over 3,895 visits from September 2015 to June 2019. Of these, 186 met eligibility criteria (at least four visits), with a median of eight visits (mean=11.3, SD=8.1). Participants saw an average weight decrease during program participation of 9.7 lbs ($P<.001$), an average decrease in HbA_{1c} of 0.2 points ($P=.004$), and an average blood pressure reduction of 2.8 mmHg systolic ($P=.002$) and 1.9 mmHg diastolic ($P=.03$). One-third of participants ($n=60$) achieved clinically significant weight loss (>5%) at 18 months. The program has become financially sustainable through billing for preventive counseling services and a \$125 out-of-pocket enrollment fee.

CONCLUSIONS: WMP provides one model for primary care practices to develop a financially sustainable and evidence-based behavioral therapy weight management program for their patients with obesity. Future work will include assessment of longer-term program benefits, quality metrics, and health care costs.

(Fam Med. 2020;52(6):427-31.)

doi: 10.22454/FamMed.2020.418736

behavioral therapy (IBT) defined as greater than 12 sessions focused on a reduced calorie diet, increased physical activity, and behavioral strategies to improve adherence.⁴⁻⁵ Guidance is limited on how to translate these findings into real-world settings with practical challenges such as providers' scant time and training, causing few to deliver IBT as recommended by the US Preventive Services Task Force (USPSTF) and the Centers for Medicare and Medicaid Services (CMS).⁶⁻¹¹ Confronted with this challenge, an interprofessional group developed the Weight Management Program (WMP), an evidence-based, financially sustainable program that is scalable to academic primary care settings. This report outlines its inception, components, and initial clinical and financial outcomes.

Methods

Setting

WMP is located within the family medicine center (FMC) at the University of North Carolina at Chapel Hill. The center completes over 66,000 patient visits annually. This setting allows for an interprofessional team of clinical social workers, physicians, dietitians, and learners to deliver IBT to patients with obesity.

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Obesity is a major cause of preventable death and disability, with increasing prevalence globally. Over 30% of US adults meet criteria for obesity (body mass index [BMI]≥30 kg/m²), increasing their risk of cancer, heart disease, diabetes, and arthritis.¹⁻² Effective

obesity treatment requires long-term, high-intensity strategies to address all its dimensions.³ Primary care providers are ideally suited to manage this chronic disease. Two large trials report clinically significant weight loss in primary care settings stemming from high-intensity

Intervention

The FMC has operated a Tobacco Treatment Program since 2007. Given the parallel motivational and behavioral changes required to stop tobacco use and maintain weight loss, staff surveyed FMC providers regarding their desire for a similar program to treat obesity. Results revealed an unmet need, spurring a WMP pilot in 2015, which began with one clinical social worker offering four counseling hours per week of IBT to a quarter of FMC patients with obesity. The program expanded to all FMC patients in 2016 and to outside and self-referred patients in 2017 (Table 1). This report gives outcomes throughout the program's evolution.

WMP's structure is based on USPTF and CMS guidelines, offering 26 IBT sessions via group and individual counseling over 1 year (Figure 1). Participants first complete a group orientation where they learn WMP's guiding principles, nutrition guidelines (Harvard's Healthy Eating Plate)¹² and set SMART (specific, measurable, action-oriented, realistic and time-bound) goals to promote weight loss. WMP's guiding principles are: (1) sustainable change; (2) 5%-10% weight loss; (3) setting goals and taking positive health actions; and (4) self-care.

After orientation, participants choose to initiate individual and/or group counseling. In 30-minute individual sessions, clinicians engage patients using motivational interviewing, help them set SMART goals, and employ cognitive behavioral therapy and mindfulness techniques

focused on helping patients maintain clinically significant weight loss (at least 5% from baseline).¹³

Sixty-minute group sessions, based on the Diabetes Prevention Program's "Prevent T2" curriculum occur twice per month.¹⁴ The curriculum is repeated allowing for rolling admission.

WMP also offers monthly maintenance group visits beyond the initial year. These groups do not follow a specific curriculum but focus on long-term behavior change strategies.

Current paid staff includes 20 counseling hours per week by clinical social workers. WMP has also integrated preventive medicine and family medicine residents and graduate students into the treatment team. Residents and students work alongside experienced clinicians before working independently. Ongoing education includes biweekly case consultations, guest speakers, and journal article review. WMP clinicians refer patients to registered dietitians, obesity medicine specialists, and bariatric surgeons when appropriate.

Evaluation Methods

We extracted participant health data from the electronic health record and evaluated retrospectively. Analysis was limited to FMC patients with multiple weight, blood pressure, and hemoglobin A_{1c} (HbA_{1c}) values documented over time. Similar to other studies showing sustained program commitment, eligibility for evaluation required completion of at least four visits, though the mean number of sessions completed (11.3, SD=8.1) was closer to the 12 session cutoff for

IBT.¹⁵ Changes in weight and systolic and diastolic blood pressures were determined by comparing the last value measured within 18 months to baseline. Changes in HbA_{1c}, typically an annual measure, were determined by comparing the last value measured within 24 months to baseline. We used paired *t* tests to assess changes in HbA_{1c}, weight, and systolic and diastolic blood pressures from baseline (Figure 1).

The University of North Carolina's Institutional Review Board approved this study (#18-0358).

Results

From September 2015 to June 2019, WMP served 673 individuals over 3,895 visits (Table 2). Participants' mean starting weight was 248 lbs (SD=58.3) and average weight loss was 6.12 lbs (SD=21.7), or 2.4% (SD=7.7%). Of the patients served, 186 met inclusion criteria for evaluation with at least four visits and a baseline weight, blood pressure, and HbA_{1c} recorded. Participants completed an average of 11.3 visits (median=8, SD=8.1) with 16% participating in group sessions. Average HbA_{1c} decreased significantly (6.7 to 6.5, *P*=.004). Participants' systolic and diastolic blood pressures showed significant improvement (mean difference 2.8 mmHg, *P*=.002, and 1.9, *P*=.03, respectively). Participants experienced a significant reduction in weight (9.7 lbs, *P*<.001). See Table 3 for detailed results.

Financial sustainability through billing receipts was not possible with preventive counseling CPT codes exclusively (Figure 2). WMP was

Table 1: Weight Management Program Growth, 2015-2019

Year	Patient Visits per Month Mean (SD)	Total Patients Served	MSW Clinical FTE	Total MSW Interns	Total Preventive Medicine Residents
September–December 2015	23.5 (10.5)	34	0.2	0	0
2016	52.2 (27.6)	141	0.4	1	1
2017	104.2 (15.0)	290	0.5	1.5	1
2018	98 (8.7)	246	0.5	2	2
January–June 2019	124.7 (13.6)	190	0.5	2	2

initially subsidized by institutional funding for tobacco treatment programs. Consequently, WMP added an out-of-pocket \$125 enrollment fee, which nearly covers all expenses when combined with receipts. Paid

expenses are 20 counseling hours per week by clinical social workers. In-kind expenses include medical director oversight, counseling and office space, and learner clinic time.

Discussion

Obesity is the second-leading cause of preventable death globally.¹⁶ Primary care providers are well-positioned to treat obesity, but lack time to help patients achieve lasting behavior change. WMP highlights the role nonphysician providers have in comprehensive, affordable, and evidence-based obesity treatment. It provides a model for building weight management into the operations of an academic family medicine department, which can draw from a diverse panel of ancillary providers to extend care delivery, promote interprofessional collaboration, and enhance training. The program appears to demonstrate that IBT sessions are associated with clinically significant weight loss and improvements in HbA_{1c} and blood pressure.

This study has several limitations. Participants were mostly female, making it difficult to discern gender differences. Only one-half of patients completed at least four visits, showing additional efforts are needed to retain participants. Potential factors influencing retention include cost, insurance coverage variability, recommended visit frequency, and the program’s focus on sustainable change over rapid weight loss,

Figure 1: Statistical Analysis Flowchart

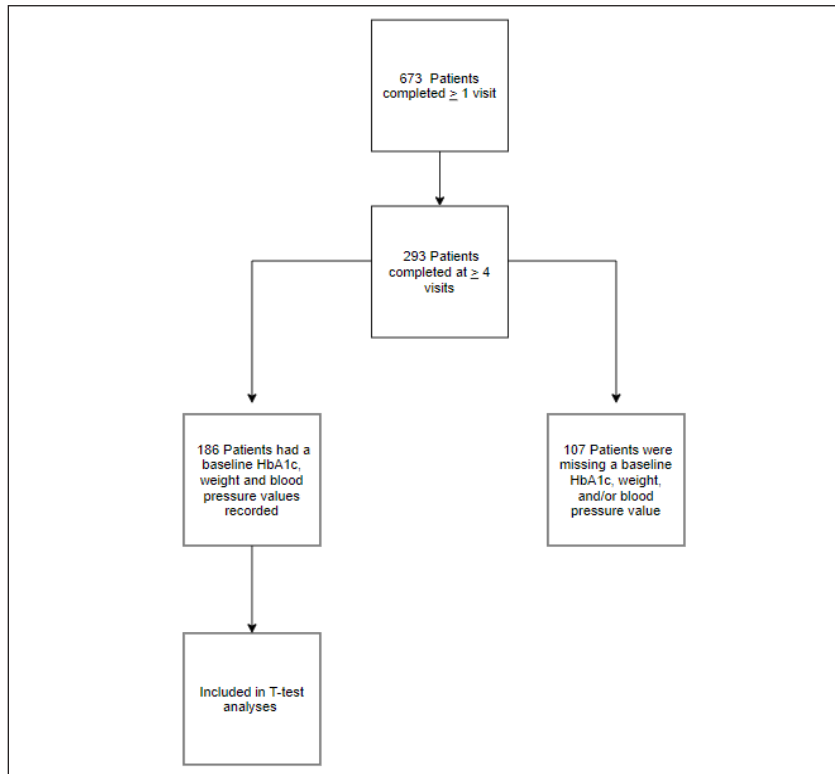


Table 2: Demographics (n=673)

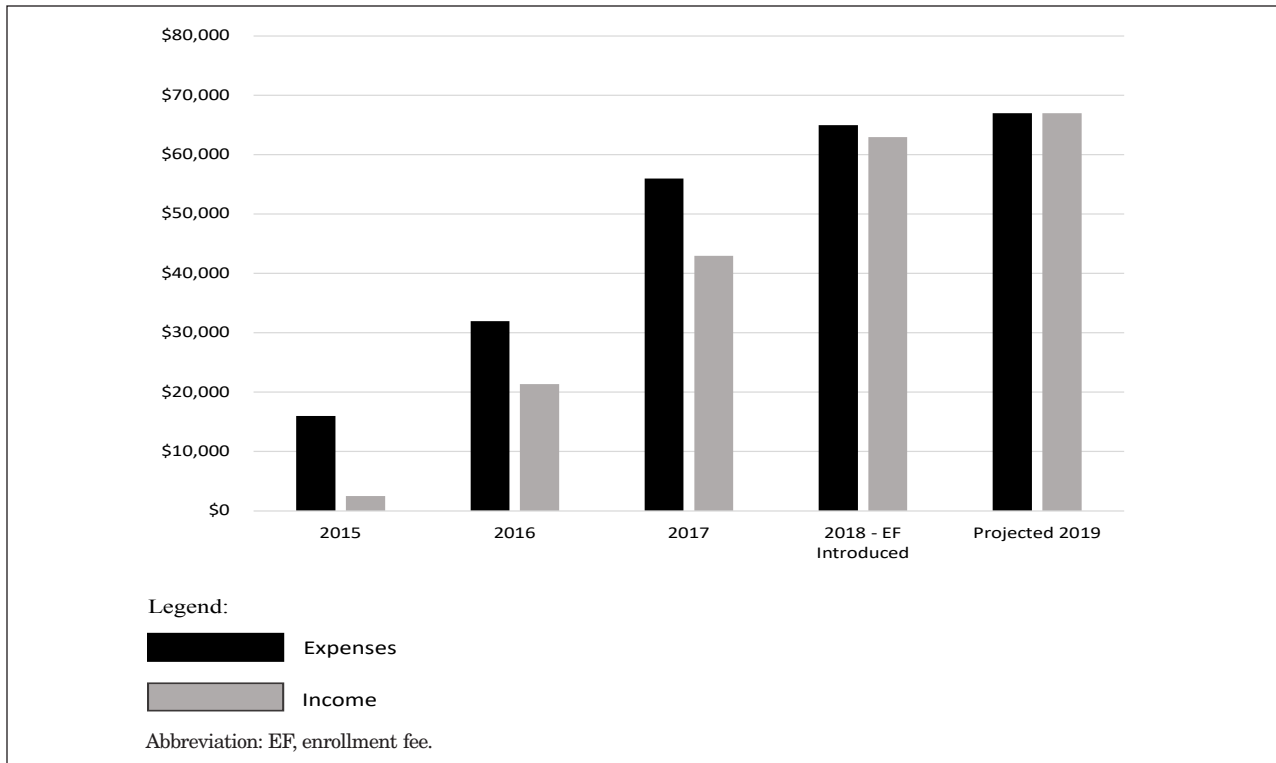
Characteristic		% (n)	Patient Visits Mean (SD)
Race	White/Caucasian	47.3 (318)	6.8 (7.8)
	Black/African American	43.5 (293)	5.1 (6.5)
	Other	9.2 (62)	3.8 (5.2)
Ethnicity	Non-Latino/Hispanic	92.0 (619)	
	Latino/Hispanic	5.0 (34)	
	Other	3.0 (20)	
Biological sex	Female	77.9 (524)	5.7 (6.9)
	Male	22.1 (149)	6.2 (7.8)
Comorbidity	Hypertension	55 (372)	6.2 (7.5)
	Depression	28 (187)	5.8 (8.2)
	Diabetes mellitus, type 2	26 (176)	5.5 (6.6)
	Obstructive sleep apnea	23 (156)	6.9 (7.5)
	Osteoarthritis	22 (147)	6.8 (7.7)
	Polycystic ovarian syndrome	5 (33)	8.0 (10.2)

Table 3: Change in Health Values From Baseline to Follow-up of Participants in UNC Weight Management Program, a Primary Care-based Weight Management Program*

	Total n=186 Mean (SD or 95% CI)	Male n=38 (20.43%) Mean (SD or 95% CI)	Female n=148 (79.57%) Mean (SD or 95% CI)
Pre HbA _{1c} (%)	6.66 (1.45)	6.99 (1.75)	6.57 (1.38)
Post HbA _{1c} (%)	6.46 (1.29)	6.81 (1.57)	6.37 (1.19)
Pre-post change in HbA _{1c}	0.196 (0.007-0.385, <i>P</i> =.04)	0.185 (-0.428-0.798, <i>P</i> =.53)	0.198 (0.009-0.388, <i>P</i> =.04)
Pre systolic BP (mmHg)	133.6 (15.23)	138.13 (16.79)	132.40 (14.64)
Post systolic BP (mmHg)	130.8 (15.95)	134.34 (18.72)	129.87 (15.11)
Pre-post change in systolic BP	2.78 (0.45-5.11, <i>P</i> =.02)	3.79 (-1.70-9.28, <i>P</i> =.17)	2.52 (-0.82-5.122, <i>P</i> =.06)
Pre diastolic BP (mmHg)	80.96 (10.23)	83.08 (9.22)	80.42 (10.43)
Post diastolic BP (mmHg)	79.03 (10.69)	81.16 (10.11)	78.48 (10.80)
Pre-post change in diastolic BP	1.94 (0.214-3.66, <i>P</i> =.03)	1.92 (-0.95-4.79, <i>P</i> =.18)	1.94 (-0.11-3.99, <i>P</i> =.06)
Pre weight (lbs)	252.87 (55.91)	280.57 (50.33)	245.76 (55.20)
Post weight (lbs)	243.15 (56.70)	270.13 (53.70)	236.22 (55.53)
Pre-post change in weight	9.72 (6.57-12.87, <i>P</i> < .001)	10.44 (1.57-19.31, <i>P</i> =.022)	9.53 (6.23-12.84, <i>P</i> <.001)
≥5% weight loss	32.26% (n=60)	26.32% (n=10)	33.78% (n=50)
≥7% weight loss	21.5% (n=40)	18.42% (n=7)	22.3% (n=33)
≥10% weight loss	13.98% (n=26)	10.53% (n=4)	14.86% (n=22)

* These data exclude 72.4% (n=487) of total patients served who either did not complete four sessions or did not have a baseline HbA_{1c} value, within 12 months of their start date, to compare changes.

Figure 2: Financial Sustainability Over Time: Expenses vs Income



which is not aligned with some patients' goals. While we saw significant changes in HbA_{1c} values, only half of eligible patients had follow-up HbA_{1c} values, which may have limited an ability to detect even larger differences in glucose control. Blood pressure and weight measurement strategies were not standardized as they were obtained by multiple personnel during clinical encounters. Finally, several variables were not measured, such as quality of life indicators.

We learned that existing preventive counseling CPT codes (G0447, 99402-99404, 99412) are insufficient to achieve financial sustainability. Instead, WMP reached sustainability by including an out-of-pocket enrollment fee and in-kind institutional resources. The enrollment fee likely limits low-income patient participation. WMP investigated a sliding scale fee structure and scholarships, however institutional policies have not permitted these solutions. Leadership continues to explore strategies to increase access.

This real-world study of a weight management program within a busy academic practice highlights the applicability for other primary care practices. WMP is undertaking quality improvement efforts to increase retention, including the use of telemedicine. Broader adoption of such evidence-based models is critical in treating obesity, particularly as the US health care system transitions toward a value-based payment model wherein health care systems are paid a set amount per patient to deliver quality care.¹⁷ Under this new model, it is vital to assess WMP's impact on overall cost per patient and quality metrics related to weight loss, blood pressure, and HbA_{1c}.

ACKNOWLEDGMENTS: The authors thank the many people who have helped build WMP through data reporting, IRB approval, and collaborative patient care. This list includes, but is not limited to: Nathan Brunson, Christopher Burner, Allegra Burton, Patricia Cary, Meredith Duke, Tim Farrell, Laura Farris,

Kevin Greats, Laura Higginbotham, Angela Lipscomb-Hudson, Sriram Machineni, Lana Nasrallah, Seyi Olusina, Christine Peat, Kylie Piper, Avril Rowerdink, Abby Sepanski, Philip Sloane, Susannah Southern, Sarah Sterling, Ryan Talbert, Kevin Tate, Shavonda Thomas and Robert White.

The authors appreciate the UNC Department of Health Behavior in the Gillings School of Global Public Health for their two capstone projects, which were integral to the foundation of the program. Finally the authors are grateful for the ongoing support and teamwork of all the faculty, residents and staff of the UNC Family Medicine Center, Chapel Hill, North Carolina.

RELATED PRESENTATIONS: Portions of this report were included in the following presentations:

1. Ortiz-Pujols S, Wilhoit-Reeves S, Sisler L, Burner C, Kaysin A, Goldstein AO. Lessons learned from implementing a weight management program in a patient-centered medical home based on USPSTF recommendations. Presentation at the 2018 Society of Teachers of Family Medicine Annual Spring Conference in Washington, DC.

2. Ortiz-Pujols S, Wilhoit-Reeves S, Sisler L, Porterfield D, Goldstein AO. Is it possible to have a financially viable, evidence-based, weight management program in a patient centered medical home? Presented at the 2018 ObesityWeek Annual Conference in Nashville, TN.

3. Sisler L, Costa J. Promoting sustainable weight loss: a model for weight management in primary care. Presented at the 2019 Society of Teachers of Family Medicine Annual Spring Conference in Toronto, Ontario, Canada.

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