

Implementing obesity management in primary care: Linking evidence based guidelines
with a nurse practitioner model of care

By

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Background

Obesity, defined as having a body mass index (BMI) of greater than 30, is an epidemic affecting more than one third of adults in the United States (U.S.). Obesity is a growing global concern with the worldwide prevalence doubling in the last 3 decades to the current level of around 13% (World Health Organization [WHO], 2015). Obesity carries significant morbidity and mortality, and is associated with conditions such as coronary artery disease, stroke, diabetes, and some types of cancer. The estimated cost of obesity was \$147 billion in the U.S. in 2008 (Centers for Disease Control and Prevention [CDC], 2014). Focusing on the control and maintenance of obesity can have considerable effect on the health of the patient, improve or prevent chronic illness, and ultimately reduce health care expenditure.

Often nutrition and weight loss counselling is overlooked or ineffective, despite readily available practice guidelines. Kraschnewski et al. (2013) found that between the years of 1996 and 2008, there was a 41% decline in primary care led obesity related counseling in the U.S. despite rising rates of obesity. This decline in obesity counseling is not consistent with the U.S. Preventive Services Task Force (USPSTF) recommendations of using intensive behavioral management for patients with a BMI of 30 or higher. Intensive management is defined as frequent follow up with patients, setting weight loss goals, improving diet, increasing physical activity, addressing patient barriers, encouraging self- monitoring, and working with patients on

a plan for maintenance (U.S. Preventive Services Task Force [USPSTF], 2012). The WHO (2015) also recommends individuals limit energy intake from fats and sugars, increase physical activity to 150 minutes per week, and that we maintain a culture of support and political commitment toward obesity management.

Literature Review

There are consistent practice guidelines recommending comprehensive, intensive behavioral management for obesity (National Institute for Health and Clinical Excellence [NICE], 2006; USPSTF, 2012;). Providers must find uniform, tailored methods to effectively deliver obesity management to patients (Sinfield, Baker, Pollard, & Tang, 2013). High intensity behavior modification (Shay, et al., 2009; Ostovan, Zibaenezhad, Keshmiri, & Shekarforoush, 2013), staff training (Saeidi, Johnson, & Sahota, 2013), and using a multi-disciplinarian approach (Yoong, Carey, Sanson-Fisher, & Grady, 2012) have all been determined to be effective methods for obesity management in primary care. There is also evidence suggesting that these interventions are cost effective (Bachman, 2007; Tsai et al., 2013). Research affirms that reducing weight, even in the older population, can reduce health care costs in the future (Goldman et al., 2009). Despite the abundance of evidence supporting weight management in primary care, there continues to be barriers to implementation. Patients and providers may struggle with lack of motivation, knowledge deficit, and inadequate resources (Sinfield et al., 2013).

Utilization of obesity management guidelines has been deemed effective in primary care: one study found that 78% of patients participating in intensive lifestyle management were

able to lose greater than five percent of their body weight in three months (Ostovan et al., 2013). Focusing on the process losing weight, which is what current guidelines support, seems to be associated with greater weight loss than focusing on the end goal of weight loss alone (Freund & Hennecke, 2012). Providing educational strategies on weight loss and lifestyle change in primary care can be effective to help patients lose weight and additionally maintain the weight loss on a long term basis (Chambers & Swanson, 2012). Smart phone apps have been suggested to improve convenience and compliance with diet and exercise tracking, thus may be an additional tool to promote patient success (Carter, Burley, Nykjaer, & Cade, 2013).

Weight management and lifestyle change for treatment for medical conditions is strongly supported. The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-8) guidelines recommend lifestyle management as initial therapy for prehypertension; and hypertension should be managed with medications in combination with lifestyle change (James et al., 2014). Regardless of the specific diet utilized, modest weight loss has been associated with improved blood pressure and blood cholesterol biomarkers (Leichtle et al., 2011; Scott et al., 2013).

A Model of Care to Bridge Evidence and Practice

Partnering with a nurse practitioner (NP) may bridge evidence to practice and provide an ideal model of care for a weight loss intervention. The MSU Sustained Partnership Model of Nurse Practitioner Primary Care is a framework describing the care provided by an NP practice model (Dontje, Corser, Kreulen, & Teitelman, 2004). This model outlines and defines the NP processes of care in promoting healthy behaviors and eliciting satisfaction among patients (see

Figure 1). The key concept of NP care is that of partnership. The processes contributing to the sustained partnership between NP and client include: patient empowerment, continuity of care, shared decision making, and holistic care. The proposed outcomes of utilizing this model include: increased health promoting behaviors, improved utilization of care, client satisfaction, and improved health status (Dontje et al., 2004).

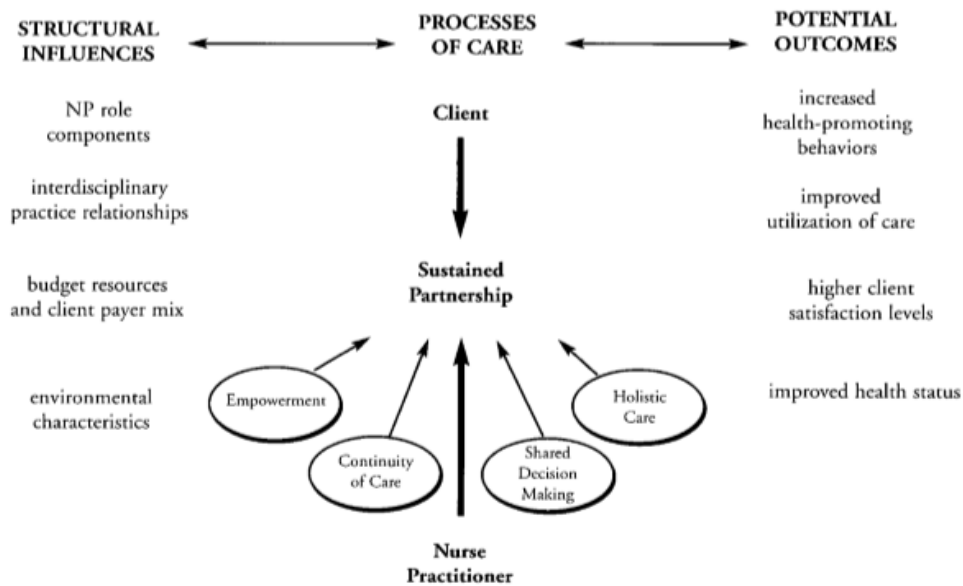


Figure 1. The M.S.U. “Sustained Partnership” Model of N.P. Primary Care (Dontje, Corser & Kreulen, 2002).

Purpose

The purpose of this intervention was to utilize an NP as the bridge to align evidence with practice for obesity management in primary care. This was done by pairing an NP model of care with intentional use of obesity management guidelines in adults. This was a four month program. Analysis was done to determine whether this method effectively addressed obesity management for the selected patients and overcame common barriers to practice. The analysis

examined (a) patient utilization of provider services and compliance with follow up, (b) health promotion and patient self-efficacy with the consistent use of calorie and exercise dairies, and (c) improved health status measured by weight loss and improvement in comorbid disease markers.

The practice inquiry questions focused on utilization, health promotion, and health status improvement. Were patients able to consistently attend regular follow up visits every three weeks as recommended per USPSTF guidelines? Did utilizing an NP model of care impact patient health promotion through consistent use of a food and exercise diary? Did integration of the NP model of care with evidence based guidelines improve patient health status in the areas of weight, hypertension, hyperlipidemia and hyperglycemia?

Methods

Description of Intervention

This obesity management program utilized a four month cohort design with mixed methods. An evidence based program, proposed by Shay et al. (2009), based upon the USPSTF guidelines was applied. The patient's initial daily caloric needs were calculated (weight in pounds x 10 – 500), and the patient chose how to track calories: paper diary, internet, smartphone etc. Patients were introduced to the smart phone app myfitnesspal (Under Armour, 2015), and briefly instructed in its use if they chose this method. Caloric intake was not less than 1200/1500 calories per day for women/men. Ideal weight was negotiated between provider and patient based upon the BMI recommendation, with initial weight loss goals of no more than ten percent of current body weight. The goal of weight loss was one to

two pounds per week. Patients were encouraged to participate in 150 minutes of weekly exercise (Shay et al., 2009). They were provided individualized strategies for exercise based upon their personal circumstances, lifestyles, preferences etc. Patients weighed themselves weekly at home and returned to the clinic every 3 weeks for weight checks and follow up.

Depending on the patient's baseline knowledge of healthy eating, the initial focus was to simply limit and track the number of calories with a gradually increasing emphasis on improving food choices. Calorie counting provided patient accountability to themselves while follow up appointments provided an external source of accountability. Appointments were opportunities to individualize discussion regarding specific foods, exercise, diary review, and to address any barriers that arose. Goals, caloric intake, and daily exercise recommendations were modified based upon patient needs. Strategies used include continuity of care, patient empowerment, and shared decision making.

Setting and Sample

This intervention was implemented in a small, privately owned, Midwestern U.S. suburban primary care office. The practice is comprised of seven physicians and one NP. These providers see a combined total of thirty thousand patients per year and recognize roughly five million dollars in annual revenue.

For inclusion in this implementation project the individual needed to currently be a patient within the practice, at least 18 years of age with a BMI of 30 or greater. Exclusions included pregnancy, as well as individuals at high risk for cardiovascular complications from exercise. The American Heart Association's class B, C, and D cardiac risk classification was used

for exclusion: known coronary artery disease, valvular heart disease, congenital heart disease, congestive heart failure and cardiomyopathy (Fletcher et al., 2001). The reason for this exclusion was that exercise was a key component of this intervention.

A convenience sample was used. Patients were recruited at office visits by providers and office brochures. Patients were asked to participate if they met inclusion criteria and self-reported readiness for change. Patients were asked if they were thinking about making changes, planning on making changes, or currently making changes. These questions were based on Prochaska's Transtheoretical Model (Glanz, Burke, & Rimer, 2011).

Data Collection Procedures

Data collection occurred in 2015. Patients received a demographic survey, their stage of readiness for change was recorded, and they signed a consent form at their first visit. Baseline co-morbidity data was collected via chart review, including laboratory drawn blood samples for low density lipoprotein cholesterol (LDL-C) and fasting blood sugar (FBS), and was recorded in milligrams per deciliter (mg/dL). If the patient had not had the laboratory tests in the past 12 months, baseline values were drawn. Baseline systolic blood pressure (SBP) and diastolic blood pressure (DBP) were taken via in-office manual sphygmomanometer and recorded in millimeters of mercury (mmHg). At each visit the participant's food and exercise diaries were reviewed and it was documented whether they used the recording device "all of the time", "some of the time", or "none of the time". Weight and BMI were recorded at each visit. The number of follow up visits the patient attended throughout the program was also recorded. FBS, LDL-C, and blood pressure were rechecked and recorded prior to the sixth follow up visit.

Ethical Issues and Approval

Institutional Review Board (IRB) permission was obtained prior to the start of the program. One potential conflict of interest to note is that these were paid visits by patients and the practice did recognize revenue from these encounters. A common barrier to weight loss is the monetary cost (Sinfield et al., 2013); therefore, maintaining this aspect routine practice was essential to determine the feasibility of implementing an evidence based primary care weight management program.

Regarding human subject's concerns, the risk was minimal to patients. There are standards in practice to determine the patient's cardiovascular health prior to initiation of a new exercise routine. Assessing the patient's risk profile per American Heart Association (AHA) guidelines (Fletcher et al. 2001) was adhered to.

Statistical Analysis

Data analysis was done with Excel™ and SPSS™. The weight and BMI changes were compared using the initial and the final visit data, and the percent of body weight lost was analyzed. Comorbidity markers FBS, LDL-C and blood pressure were assessed for change. The number of visits completed by patients was quantified. The above measures were analyzed using mean and standard deviation. Wilcoxon testing was used to determine significance. The rate of patient follow up and patient adherence with the diet and exercise diary use was also measured.

Results

Demographics

Forty patients participated in the weight loss intervention (N = 40). Over the duration of the four-month intervention period there was 70% attrition (non-completers). Table 1 shows side by side comparison of the demographic data between the participants who remained active in the program (completers) and the non-completers. Table 1 also compares the baseline health data; the completers began with lower weight, BMI and FBS, while the non-completers initially had lower blood pressure and LDL-C.

Table 1. *Baseline Comparison of Program Completers and Non-completers*

	Total Participants N=40	Completers n=12	Non-Completers n=28
Demographics			
Gender			
Female	68%	75%	64%
Male	32%	25%	36%
Age in years	52.4 (11.7)	57.8 (9.0)	50 (12.1)
Age range	20-71	42-71	20-70
Ethnicity			
White	90%	100%	86%
Black	10%		14%
Mean SOC ^a	3.3	3.1	3.4
Baseline Data			
Weight	245 (55.0)	218 (31.8)	257 (58.9)
BMI	38.7 (6.0)	35.5 (3.7)	40 (6.3)
SBP	125 (13.9)	129 (13.5)	124 (14.0)
DBP	82 (6.5)	84 (5.6)	82 (6.8)
LDL-C	111 (28.6)	122 (26.9) ^b	108 (29.1)
FBS	100 (17.2)	98 (26.7) ^b	100 (13.0)

Note. Statistics unless otherwise noted report mean (SD).

BMI = body mass index; SBP = systolic blood pressure; DBP = diastolic blood pressure; LDL-C = low density lipoprotein cholesterol; FBS = fasting blood sugar.

^a SOC Stages of change levels 1 = precontemplation, 2= contemplation, 3= preparation, 4 = action, 5 = maintenance.

^b indicates n=10

Adherence to Follow Up

Twelve patients completed the full program, and there were 28 non-completers. There were six visits possible for each patient during this intervention. The completers were highly compliant with follow up; the average visit attendance per patient was 5.8 out of the six possible (see Table 2). The non-completers stopped attending visits at various times: 14 patients completed one visit, eight patients completed two visits, three patients completed three visits, and three patients completed four visits.

Table 2. *Utilization of Program and Patient Self-Monitoring: Comparison of Program Completers and Non-completers*

	Overall N = 40	Completers n = 12	Non-Completers n = 28
Total possible visits	240	72	168
Actual visits attended	108	69	39
Percentage of follow up visits attended	45%	96%	23%
Visit attendance per patient (6 possible)	2.7	5.8	1.4
Compliance with calorie tracking per visit:		n=12	n=14 ^a
All of the time		72%	22%
Some of the time		23%	48%
None of the time		5%	30%

Note. ^aPatients had more than one visit prior to discontinuing the program.

Health Promotion

Completers demonstrated some level of self-monitoring of food and exercise 95% of the time (see Table 2). 83% of diet and exercise tracking was done via a smart phone app.

Health Status Improvement

At the completion of the intervention there was improvement in every health outcome indicator that was examined (see table 3). Wilcoxon testing was used to determine the level of significance due to the small sample size. There was statistically significant weight loss between the first visit and the final visit of 0.002 with $\alpha = 0.05$, BMI change was also statistically significant at 0.002 $\alpha = 0.05$. There was no statistical significance found in the following health outcome changes between the first and final visits: SBP 0.052, DBP 0.181, LDL-C 0.333, and FBS 0.799 with $\alpha = 0.05$.

Table 3. Health Outcomes for Completers of the 4 Month Weight Loss Program (n=12)

	Baseline	Post Intervention	Change
Weight in pounds	218.1 (31.8)	200.7 (30.4)	↓ 17.4 (8.5)
BMI %	35.5 (3.7)	32.7 (3.4)	↓ 2.8 (1.4)
SBP mmHg	129 (13.5)	118 (11.3)	↓ 11 (16.0)
DBP mmHg	84 (5.7)	81 (4.3)	↓ 3 (5.9)
LDL-C mg/dL ^a	122 (26.9)	118 (28.1)	↓ 4 (16.1)
FBS mg/dL ^a	98 (26.7)	93 (10.8)	↓ 5 (21.4)

Note. Statistics report mean (SD).

BMI = body mass index; SBP = systolic blood pressure; DBP = diastolic blood pressure; LDL-C = low density lipoprotein cholesterol; FBS = fasting blood sugar.

^aindicates n=10

Discussion

Demographic Comparison

The completers were most often white, middle aged women. The ability of participants to identify with a white female provider may have influenced the ability to create a partnership, as there were more male and minority patients in the group of non-completers (Dontje et al., 2004). The self-reported stage of change did not appear to be an accurate indicator of success, as the non-completers reported a slightly higher baseline stage of change (Glanz et al., 2011).

The non-completers had higher baseline BMI levels and were more likely to have blood

pressure and LDL-C levels at goal when compared to the completers. It is possible there were more barriers to follow up in the heavier population. There may also have been a perception of better health among the non-completers, inferred by their lower baseline LDL-C and blood pressure levels.

Were Patients Able to Consistently Attend Follow Up Visits Every Three Weeks as Recommended per USPSTF Guidelines?

The USPSTF (2012) obesity management guidelines, which advise intense behavioral management in primary care, were demonstrated to be feasible. The completers of this program had an extremely high level of utilization, following up 96% of the time. The use of a single NP provider strengthened continuity of care and shared decision making, which can impact partnership and patient accountability (Dontje et al., 2004). Keeping visits focused on the process of weight loss may have also contributed to success (Freund & Hennecke, 2012).

The high level of patient commitment coupled with densely scheduled appointments may lead to provider concern that there is inadequate time in a daily schedule to integrate guidelines into routine practice. With the 70% rate of attrition, however, this does allow providers an opportunity to offer weight management; recognizing that this may potentially only benefit a small number of patients at any given time.

Primary care providers routinely have 10 to 20 minute appointments which are focused on discussing chronic disease management, health maintenance, and acute concerns all within a single encounter; time is a difficult barrier to overcome to promote weight loss counseling (Sinfield et al., 2013). Devoting primary care visits exclusively to weight management can

provide an opportunity to re-focus on this key area of health (Kraschnewski et al., 2013). The dedicated intervention visits were brief and fit well within a standard practice model.

Did Utilizing an NP Driven Model of Care Impact Patient Health Promotion Through Consistent Use of a Food and Exercise Diary?

Program participants were very consistent with self-monitoring via use of their food and exercise diaries. Self-monitoring occurred 95% of the time with completers and 60% of the time with non-completers. Part of this success may have been attributed to the use of a smart phone app (Carter et al., 2013), which regularly received positive participant feedback. Success with self-monitoring was also impacted by the NP partnership with the patient (Dontje et al., 2004). Patients were consistently empowered to become active participants in promoting health; they were provided knowledge, skills, and tools to navigate and record healthy eating and exercise. NP partnership, built upon empowerment, supported patient adherence and accountability with self-monitoring.

Did Integration of the NP Model of Care with Evidence Based Guidelines Improve Patient Health Status in the Areas of Weight, Hypertension, Hyperlipidemia and Hyperglycemia?

Patient health status was improved with intentional implementation of USPSTF guidelines coupled with an NP model of care. Weight loss was determined to be significant in this program; in four months' time completers lost an average of 17.4 lbs and BMI was reduced by 2.8%. It is well documented that weight loss improves other indicators of health (James et al., 2014; Leichtle et al., 2011) which was consistent with this program's results, though the reduction in blood pressure, LDL-C, and FBS was not found to be statistically significant.

Using an NP model of care influenced patient utilization of services and affected health promotion via patient empowerment, continuity of care, and shared decision as stated above. These qualities ultimately contributed to improved health status, significant reduction in weight, and observed improvement in other health markers (Dontje et al., 2004).

Limitations/Future Research

This program was implemented with a relatively small group and only a single provider directed the interventions. Further investigation with a larger, more diverse sample may be of benefit to determine generalizability. Timing should also be considered, weight loss is a lifelong journey. This program was brief in order to determine effectiveness of incorporating evidence based guidelines into practice, and to determine the effect on patient outcomes. Long term follow up and maintenance are guideline recommendations that also need examination through a lens of practical implementation (USPSTF, 2012, Shay et al., 2009).

This was not a multidisciplinary approach. Referral to a nutritionist may offer some additional benefit, particularly for assistance with more specific dietary needs such as diabetes or food intolerances. Group visits are another option for exploration. Groups may benefit patients and improve provider efficiency and productivity. In addition, continued research examining success and attrition in weight management programs will aid providers in selection of patients likely to benefit from a program such as this.

Conclusions

Primary care providers should offer patients the option to follow in the office for weight management per guideline recommendations. Patients that have a BMI above 30% and comorbid disease measures (elevated blood pressure, LDL-C, or FBS) appear to be candidates

likely for success. Primary care is an ideal setting to focus on obesity management and the perspective of improving health sheds a fresh light on weight loss. Focusing on healthy behaviors and making gradual changes was effective. Calorie counting and using a food and exercise diary maintained patients' self-accountability, while frequent follow up provided an external source of accountability.

Nursing as a profession tends to focus on health promotion, disease prevention, patient education, and partnerships with patients. All of these qualities make an NP an ideal health provider to assist patients with obesity management. Managing obesity is a lifelong journey; continued support throughout this journey is a valuable asset primary care providers can offer in an effort to improve the health of their patients and the communities in which they serve.

Box: Linking Evidence to Action

- Use dedicated primary care visits to focus on weight management.
- Program Outline (Shay et al., 2009, USPSTF, 2012)):
 - Set goals for weight loss in increments of not more than 10% of body weight
 - Calorie counting – basic starting point (weight in lbs. x 10 – 500)
 - Exercise 150 minutes per week
 - Appointments every three weeks to review diary and adjust calorie/exercise goals, problem solve, provide accountability
- Smart phone apps were the preferred method for calorie tracking. Most patients used myfitnesspal (Under Armor, 2015).
- Start the program with very basic goals – record calories and exercise. Build on improving healthy behaviors gradually at follow up visits.

- Create a culture of partnership and accountability; emphasizing shared decision making and patient empowerment (Dontje et al., 2012).

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