ORIGINAL RESEARCH

Evaluation of the Effectiveness of Making Weight Watchers Available to Tennessee Medicaid (TennCare) Recipients

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INTRODUCTION: In 2006, Tennessee Medicaid (TennCare) offered its recipients access to Weight Watchers for a nominal fee. The aim of this study was to determine the weight change among adult participants.

METHODS: This is a retrospective analysis of weight change among overweight and obese TennCare recipients who participated in the program. Weight change was calculated as the median difference from the first date of participation to the last. Weight change was also calculated as median percentage change from initial weight and categorized as weight loss or gain of 0 to 5, ≥ 5 to 10, and ≥ 10 %.

RESULTS: During the study period, 1,605 individuals started the program and 1192 had at least one follow-up weight measurement and thus met the inclusion criteria for the study. Women (n=1149) had a BMI of 39.6 kg/m² and men (n=43) had a BMI of 43.0 kg/m². The median weight loss for all participants was 1.9 kg, or 1.8 % of initial weight. Twenty percent of participants lost 5 % or more of their initial body weight while participating in the program. Over 13 % of participants only attended two meetings; on average, these participants lost 0.5 % of initial weight. Over 23 % of participants attended 13 or more meetings, and they lost an average of 6.4 % of initial weight.

DISCUSSION: Twenty percent of TennCare recipients who joined Weight Watchers lost a clinically significant amount of weight. Participants who attended more meetings lost more weight. Reimbursement for Weight Watchers has been maintained by all of the Medicaid managed care organizations in Tennessee. Partnerships that allow low-income populations to access weight loss programs may provide a valuable weight management tool.

KEY WORDS: obesity; weight management; Medicaid.

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INTRODUCTION

Obesity is among the most important health issues facing the United States. Over 35.7 % of US adults are obese and another 33.1 % are overweight,¹ with ethnic minorities and people of low socioeconomic status disproportionately affected.² Furthermore, the direct cost of obesity to the healthcare system approached 150 billion dollars in 2006.³ That same year the rates of overweight and obesity for adults in Tennessee were 36.5 % and 28.8 % respectively,⁴ and Medicaid expenditures in Tennessee for obesity were estimated at \$724 million.^{5,6} Weight losses of as little as 5 % can improve blood pressure, blood sugar, osteoarthritis, and sleep apnea.^{7–9}

Despite the expanding literature on obesity treatment, there remains a relative paucity of interventions for low socioeconomic status (SES) populations. Low SES groups may have less access to structured weight loss interventions¹⁰ and may also face challenges associated with transportation and child care. We took advantage of an ongoing program in which the state of Tennessee partnered with Weight Watchers (WW) to offer a structured group program to Medicaid beneficiaries.

WW was the first commercial weight loss program to test its intervention in a randomized trial, and that study showed that participants in WW lost 4.3 kg (vs. 1.3 kg in usual care) after 1 year and maintained a weight loss of 2.9 kg (vs. 0.2 kg) after 2 years.¹¹ Another randomized trial that compared it to other popular diet plans also proved its effectiveness,¹² however, neither of these studies reported on the socioeconomic status of the participants. Recent studies in the UK also showed that primary care referrals to WW were effective in isolation¹³ and when compared with primary care programs¹⁴ and standard care.¹⁵

In 2006, Tennessee's Medicaid managed care program (TennCare) and the three WW franchises, which cover all Tennessee counties, formed the TennCare Weight Watchers partnership.¹⁶ Each WW franchisee signed provider agreements with each TennCare managed care organization (MCO) to provide services to TennCare enrollees. The program allowed TennCare recipients who were overweight

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or obese to attend any ongoing Weight Watchers meetings (no separate meetings were established for the TennCare participants). Participants aged 21 and over were asked for a \$1 co-pay for each visit.

TennCare beneficiaries over age 10 could join the program in two ways: 1) by self-referral if BMI was ≥ 30 kg/m²; or 2) by obtaining a doctor's note, if BMI was between 25 and 30 kg/m².¹⁶ In 2008, eligibility requirements were expanded to allow any TennCare beneficiary to participate if BMI was ≥ 25 kg/m² or with a doctor's referral. A doctor's referral was required for all children ages 10–17.

The purpose of this study was to evaluate the effectiveness of this novel partnership on weight change of adult participants aged 18 and older. We hypothesized that individuals choosing to participate would have a reduction in BMI significantly greater than 0.

METHODS

Study Design

This was a retrospective cohort study of weight change. Study participants were TennCare members who participated in the TennCare–WW Partnership Program between January 2006 and January 2009.

Data Source

WW collected data at weekly weigh-ins, and sent the data to TennCare's Division of Quality Oversight every quarter. TennCare maintained the data and provided a de-identified data set for analysis. The study was designated as exempt by the Colorado Multiple Institutional Review Board.

Intervention

WW is a popular commercial weight loss program that has been in existence for over 40 years. Meetings are held across the United States and in many other countries. WW weekly meetings include a weigh in, group-based education from a trained leader, anecdotes from individual members, and the trademarked Points Plus™ system.¹⁷ The Points system used the number of calories, grams of fiber, and grams of fat to calculate the point values of servings of food (In November 2010, WW changed to the Points Plus™ system, which uses the amount of protein, carbohydrates, fat, and fiber to assign a Points Plus™ value to food servings) [personal communication, K. Wangaard, Weight Watchers].

When the partnership began, participants were allowed to sign up for additional 12 week sessions if they lost 2.3 kg and if they attended at least 10 of the 12 meetings in one session.¹⁶ In 2008, the requirement for weight loss was discontinued. All TennCare beneficiaries are enrolled in a MCO, and all MCOs

participated in the partnership. Thus, all TennCare beneficiaries had access to this program. TennCare provided transportation for individuals who needed it.

Program payment

In 2006, TennCare MCOs paid WW \$10 per session per participant. In 2008, the payment was increased to \$19 per participant for each introductory meeting and \$11 for each follow up meeting (personal communication, J. Sartin, TennCare). Although participants aged 21 and over were asked for a \$1 co-pay for each visit, they were allowed to attend meetings even if they could not provide the co-pay.

Study Participants

The data included 1,605 TennCare recipients who participated in WW. The 15 individuals (0.9 %) with a BMI < 25 kg/m² were excluded, as they were already in the normal weight range. Additionally, 104 individuals (6.5 %) whose average weight change was greater than 7 kilograms per week were excluded from analysis because their weights were likely the result of data entry errors. The threshold of 7 kg per week has been used previously.^{18,19} Finally, 294 individuals (18.3 %) had initial weights but no follow-up data. They were not included in the primary analysis, but were included in sensitivity analysis. Thus, the sample size for the primary analysis was N=1192. A diagram of study inclusion is outlined in Fig. 1.

Outcome Measures

The primary outcome measure was weight change from baseline. This was calculated in kilograms and also as a

Figure 1. Study inclusion.

percent of starting weight. The percentage of weight change was also categorized as a weight loss or weight gain of 0 to <5 %, ≥5 to 10 %, or >10 % of initial weight.

Statistical Methods

The primary analysis combined all participants. Because there were only two men in the overweight category, overweight and obese men were combined. Weight change was calculated as the difference from the first date of participation to the last; means and standard deviations were used when the data were normally distributed and medians and interquartile ranges were used when they were not. The Shapiro-Wilk test was used to determine whether data were normally distributed. Differences between baseline weights, weight change, and percentage weight change were determined using the student's *t* test or the Wilcoxon rank sum test. To determine if final weights were different from baseline weights, paired *t* tests or Wilcoxon signed rank tests were used. Data were analyzed using SAS, version 9.2 (Cary, North Carolina, USA).

Exploratory Analyses. In a sensitivity analysis, baseline weight was carried forward for individuals without a follow-up weight. We also performed exploratory subgroup analyses with participants stratified by gender and by BMI category for women because the starting weights for men and women and for overweight and obese women were significantly different. Weight change was also analyzed based on the number of meetings attended and by age category. The number of meetings was grouped in 12-week increments because the program was administered in 12-week blocks. Individuals who participated for more than 36 weeks were consolidated into one group. For analysis by age group, categories of 10-year intervals were used, except for the 18 to 25 year-old group.

RESULTS

Participant Characteristics

Baseline characteristics are shown in Table 1. Over 96 % (N=1149) of participants were female, which is expected

Table 1. Participant Characteristics

Variables	Median (IQR; Range)	
	Overweight (90)	Obese (N=1102)
Age (years)	34 (15; 18–64)	35 (15; 18–68)
Height (m)	*1.65 (0.06; 1.63, 1.66)	1.65 (0.10; 1.30–1.93)
Weight (kg)	*76.5 (7.0; 75.0, 77.9)	110.4 (36.4; 68.5–272.2)
BMI (kg/m ²)	28.3 (2.0; 25.6–30.0)	40.5 (12.1; 30.0–89.2)

*Data are normally distributed, therefore reported as mean (standard deviation; 95 % CI)

given the demographics of Medicaid populations and of most weight loss programs. The median age for participants was 35 with a range of 18 to 65 years. The median height was 1.65 meters (range 1.30–1.93). The median weight for all participants was 108 kg (range: 62.8–272.2). The median BMI was 39.6 kg/m² (range=25.6–89.2), and over 92 % (N=1102) of the participants had a BMI greater than or equal to 30 kg/m².

Weight Change

Table 2 displays overall change and subgroup results. The median weight loss for all participants with at least one follow up weight measurement was 1.9 kg (IQR=4.7), which is equal to 1.8 % of initial weight. Obese and overweight women lost a similar amount of weight (median 1.8 % vs. 1.9 %; *p*=0.8). The median percent weight change for men was a loss of 2.5 % of initial weight, which was similar to obese women (*p*=0.4) and to overweight women (*p*=0.7).

In Fig. 2, the weight change of participants with at least one follow up weight measurement is categorized into groups by percent weight change. Among all participants, 21 % lost 5 % or more of their initial weight during participation in the program (with 8 % losing 10 % or more), 56 % lost 0 to 4.9 % of initial weight, and 23 % gained weight. Data were similar among men and women (data not shown).

Sensitivity Analysis

When baseline weights were carried forward for the 294 individuals who attended only an initial meeting, median weight loss in the entire cohort was 1.1 kg (equal to 0.9 % of initial weight), and 17 % of individuals lost 5 % or more of their initial weight.

Participant Attendance

There was high attrition among the cohort of individuals who entered the program. The median number of meetings attended was 7 (IQR=9), with a range of 2 to 92 meetings. Over 13 % of the participants (N=160) only attended 2 meetings (i.e., an initial meeting and one subsequent meeting). A total of 756 individuals (63 %) attended between 3 and 12 meetings, and 276 individuals (23 %) attended 13 or more meetings.

Weight Loss by Meeting Attendance

Table 3 shows the weight change and percentage weight change based on the number of meetings attended. Longer attendance was significantly associated with greater weight

Table 2. Weight Change

	N	Median baseline weight, kg (IQR)	Median number of visits (IQR)	Median duration of participation, weeks (IQR)	Median weight change, kg (IQR)	Median weight change, percent (IQR)	P value*
All participants	1192	108.0 (37.6)	7 (9)	9.0 (16.1)	-1.9 (4.7)	-1.8 (4.3)	< 0.001
Women							
ALL WOMEN	1149	107.4 (36.7)	7 (9)	9.0 (16.6)	-1.8 (4.7)	-1.8 (4.3)	< 0.001
Overweight	88	†76.1 (6.6)	7 (7.5)	10.3 (17.0)	-1.4 (4.7)	-1.9 (6.2)	< 0.001
Obese	1061	109.8 (35.8)	7 (9)	9.0 (16.3)	-1.9 (4.8)	-1.8 (4.2)	< 0.001
Men							
Overweight and Obese	43	132.1 (64.5)	8 (9)	9.3 (15.0)	-3.2 (6.1)	-2.5 (4.9)	< 0.001

*p value compares baseline weight to final weight

†Data are normally distributed, therefore reported as mean (standard deviation)

loss. Specifically, weight losses for individuals attending 13 to 24, 25 to 36, and more than 36 meetings were greater than those for participants attending 2 to 12 meetings. All pair-wise comparisons between groups were significant ($p < 0.001$), except for the comparison of those attending 25 to 36 and more than 36 meetings ($p = 0.2$).

Weight Change by Age Category

Table 4 shows the percentage weight change based on age category. Individuals ≥ 56 years old lost significantly more weight than did those 18–25 and 26–35 years old ($p = 0.02$ and 0.04 , respectively). There were no other statistically significant pair wise comparisons.

DISCUSSION

Medicaid beneficiaries in Tennessee who participated in WW meetings for a nominal out of pocket fee (\$1 per group) lost a median of 1.9 kg (1.8 % of initial weight) after a median of 9 weeks of participation. Weight losses were similar between men and women and between overweight and obese individuals. Median weight losses in this study are less than those generally thought to improve health and

to reduce the burden of co-morbid medical illness. However, 21 % of the individuals lost at least 5 % of their initial weight, an amount considered clinically significant and one of the FDA criteria for determining the efficacy of weight loss medications.^{7–9,20} Although there was no comparison group in this study, adults in the United States typically gain 1 to 2 pounds per year through approximately age 60.²¹ Thus, participants may have avoided some weight gain that might have occurred without the intervention. In a sensitivity analysis with baseline weights carried forward for persons dropping out 17 % of participants lost at least 5 % of starting weight.

Weight losses in this study are similar to results reported in other group interventions in low SES populations. One study reported a weight loss of 6.5 lbs (approximately 3.0 kg) after a 10-week intervention that included group nutrition counseling and the use of meal replacements.²² Another study reported a weight loss of 2.7 kg after 8 weeks for a group education intervention conducted among mothers receiving food assistance.²³ A group counseling intervention for low income Mexican-American women produced a weight loss of 2.9 kg after 20 weeks, compared with a loss of 1.3 kg for a control group.²⁴ The current study differs in design from these interventions, which were clinical trials targeting specific populations, while purpose of the TennCare–WW partnership was simply to make WW available to Medicaid recipients. However, the results of this analysis are at least somewhat comparable, as they demonstrate the effect of offering a weight loss program to a low income population. The slightly smaller weight losses in the current study are likely a result of the unselected nature of the population that was offered access to the program.

Weight losses in this analysis are less than those in the U.S. randomized trial of WW, in which participants lost 4.3 kg (approximately 4.6 % of initial weight) after 1 year and maintained a loss of 2.9 kg (approximately 3.1 %) after 2 years.¹¹ That trial was a controlled study, with participants carefully selected and screened at academic medical centers specializing in weight loss. In contrast, individuals in our population were unselected—WW was offered to all TennCare beneficiaries that were overweight or obese or who obtained

Figure 2. Weight change as a percentage of initial weight.

Table 3. Weight Change by Number of Meetings Attended

Number of meetings attended	N	Baseline weight, kg Median (IQR)	Weight change, kg Median (IQR)	Weight change, percent Median (IQR)	P value*
2-12	916	107.6 (38.5)	-1.4 (3.5)	-1.3 (3.2)	< 0.001
13-24	193	108.7 (37.6)	† -5.7 (7.0)	† -5.1 (6.3)	< 0.001
25-36	49	113.5 (37.6)	† -10.1 (8.5)	† -9.1 (7.4)	< 0.001
>36	34	114.9 (29.2)	† -13.7 (12.5)	† -11.5 (10.8)	< 0.001

* *p* value compares baseline weight to final weight

† Data are normally distributed; therefore, there are reported as mean (standard deviation)

a physician note. The only prospective study of WW to examine consecutive participants in the program reported a loss of approximately 4.4 kg after 12 weeks, with an attrition rate of approximately 70 %.²⁵ Attrition after 12 weeks in the current analysis was approximately 80 %, and mean weight loss after 16 weeks was 3.0 kg. The results may be attributable to the fact that the population for the current study was less carefully selected as compared to the older study.

Twenty-three percent of the program participants gained weight during their involvement. In the U.S. randomized trial of WW, 23 % and 37 % of participants had gained weight at the 1 and 2 year evaluations, respectively.¹¹ The most recent WW studies do not report the percentage of people who gained weight during the studies,¹³⁻¹⁵ although one of the studies displayed a 5-10 % weight gain in a figure.¹³ In an observational study of a nonprofit group weight loss program, 19, 21, and 22 % of participants gained weight at 1, 2, and 3 years, respectively.²⁶

In 2006, there were approximately 735,000 adults enrolled in Medicaid in Tennessee.²⁷ Using the BRFSS estimates that 65.3 % of Tennessee adults were overweight or obese that year,⁴ about 480,000 people would have been eligible for the TennCare Weight Watchers program. Given that only 1,600 adults participated, the reach of the program (as evidenced by the participation rate) might appear low. Members received information about the program through newsletters, direct mailings, and other TennCare programming, and providers were notified through a provider website, newsletters, and direct provider representative visits. However, it is unclear how many individuals were

referred to or asked about the program, and thus, impossible to accurately estimate the program's reach.

This study has several limitations. First, we had limited demographic and clinical data on the participants. However, because it was a Medicaid population, we know it was a low income group. In addition, ethnic minorities are disproportionately represented in TennCare^{28,29} and data provided by TennCare indicate that nearly half of participants in the WW program had at least one weight-related medical condition.¹⁶ Second, there was a limited follow-up period. Weight is often regained after the first 4-6 months of lifestyle interventions.³⁰ Thus, it is unclear how much of the health benefits of the initial weight loss would be maintained, and longer follow-up studies are needed. Third, these results are from a single state, and may not be generalized to the entire U.S. Fourth, as mentioned above, there was no comparison group in this study.

We note here that the TennCare Weight Watchers® Partnership Program no longer exists so TennCare MCOs are no longer required to offer WW to their plan participants. However, all of the MCOs have continued reimbursement for WW on their own. Therefore, the program continues to be available to TennCare beneficiaries in areas of the state served by two WW franchises (personal communication, J. Sartin, TennCare). [The third WW franchise dropped out of the partnership in December 2007 due to logistical difficulties with billing.]

Despite the limitations, these results demonstrate that some individuals from low income groups derive a benefit when offered a structured intervention for weight loss. Weight loss and maintenance of weight loss can require substantial resources, which may be lacking among low income individuals. However, more research is needed to evaluate the effect of making weight loss interventions more accessible to low SES persons, as well as to evaluate the effects of interventions in selected low SES populations. WISEWOMAN, a federally funded initiative in 20 states for low income, uninsured, and underinsured women to prevent, treat, and manage cardiovascular risk factors, is a good example of the latter.³¹

We believe that low SES populations should be a priority for studies of weight management, given their higher burden of overweight and obesity and of weight-related

Table 4. Weight Change by Age Category

Age category	N	Baseline weight, kg Median (IQR)	Weight change, percent Median (IQR)	P value*
18-25	192	106.1 (35.1)	-1.5 (3.8)	< 0.001
26-35	434	106.9 (40.6)	-1.8 (3.8)	< 0.001
36-45	325	111.1 (37.6)	-1.8 (4.5)	< 0.001
46-55	149	108.1 (32.3)	-1.8 (4.5)	< 0.001
≥ 56	92	105.6 (39.7)	-2.7 (7.2)	< 0.001

* *p* value compares baseline weight to final weight

co-morbidities. Furthermore, low SES populations may have support needs that are different than higher SES populations. For instance, in this intervention, transportation was provided by the TennCare program for those individuals who needed it. Child care may also be an issue in low SES populations. Finally, low SES populations are also more likely to have overweight and obese children,³² and interventions that focus on weight control for the whole family may be even more beneficial.

In summary, Medicaid beneficiaries in Tennessee given access to WW lost approximately 2 % of initial weight, for a nominal out-of-pocket payment. This real world experiment and others like it are critical as the United States develops a comprehensive strategy of prevention and treatment for the epidemic of obesity.

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Conflict of Interest: The authors declare that they do not have a conflict of interest.

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