Effect of Workplace Weight Management on Health Care Expenditures and Quality of Life

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Objective: We examined the effectiveness of the weight management program used by the University of Minnesota in reducing health care expenditures and improving quality of life of its employees, and also in reducing their absenteeism during a 3-year intervention. **Methods:** A differences-in-differences regression approach was used to estimate the effect of weight management participation. We further applied ordinary least squares regression models with fixed effects to estimate the effect in an alternative analysis. **Results:** Participation in the weight management program significantly reduced health care expenditures by $69 per month for employees, spouses, and dependents, and by $73 for employees only. Quality-of-life weights were 0.0045 points higher for participating employees than for nonparticipating ones. No significant effect was found for absenteeism. **Conclusions:** The workplace weight management used by the University of Minnesota reduced health care expenditures and improved quality of life.

In past decades, workplace wellness programs aimed at improving employees' health and well-being have become popular. Their popularity among employers has been largely because of expectations that through reducing risks for chronic disease, employees will, in turn, reduce their health care expenditures.[1,2] Several reviews of the literature on the effectiveness of wellness programs in the workplace[3–6] have reported that such programs reduced health care expenditures and occasionally absenteeism, and improved biometric measures that are associated with better health. In a meta-evaluation of 62 worksite studies, Chapman[5] concluded that the worksite health promotion represents one of the most effective strategies for reducing medical costs and absenteeism. The Centers for Disease Control and Prevention has endorsed workplace wellness programs by offering a set of online tools and resources to support the adoption of such programs.[7]

However, not all wellness program components are equally effective. Nyman et al[8–11] and Caloyeras et al[1] have shown that the lifestyle (or risk) management programs are generally not effective in reducing expenditures, but disease management programs were. Yet, within a generally effective program, some aspects may be ineffective. For example, although disease management was generally effective at reducing employee health care expenditures at the University of Minnesota, Jutkowitz et al[12] showed that it was not effective for participants with certain diseases. Likewise, within a generally ineffective lifestyle management program, some specific programs may be effective. Accordingly, this study focuses on the weight management component of the University of Minnesota's lifestyle management program to determine whether that program in itself has been effective.

Weight management programs are primarily designed to prevent the various health problems that are caused by obesity. A significant amount of research has been devoted to showing the effects of weight [as measured often by body mass index (BMI) to control for stature] on health, especially the connection between weight and the onset of diabetes or cardiovascular disease.[13–16] Weight management programs are attractive because they hold the promise of reducing weight and the likelihood of disease, and for employers, specifically, of reducing health care expenditures.[17,18] In a systematic review of the literature, Hartmann-Boyce et al[19] evaluated the effectiveness of 1-year behavioral weight management programs and found that the mean difference in weight between those participating in weight management programs and control groups was about -6.17 pounds after 12 months. Several studies have also sought to determine whether employees who lost weight experienced lower medical costs than who remain overweight or obese.[20–22] However, no significant medical cost saving has been found in these studies from those who experienced 5% weight loss, considered the minimum necessary to produce clinically important health benefits.[23]

In considering the effect of weight management programs on health, one way to measure a health effect is with health-related quality of life (QOL). Health-related QOL is a score on the 0 to 1 continuum, where 0 represents the QOL of a health state as bad as death and 1 represents the QOL where none of the responses of the questions in the health status survey showed a health deficiency, which is often interpreted as the best imaginable health state. QOL scores are important because they are preference weighted, and as a result, the QOL scores can be used to measure quality-adjusted life-years (QALYs), the main effectiveness measure used in cost-effectiveness analysis. In one of the first studies to use such a measure to evaluate weight loss, Bilger et al[21] examined the relationship between weight loss and QOL, as measured by the EQ-5D-3L health status questionnaire. These authors found that those who reached 5% or greater weight loss increased their QOL by 0.026 points, compared with those who did not.

These studies investigated whether weight management program participants *who achieve a certain level of success* have reduced expenditures in improved health. The decision that most employers face, however, is the more basic one of whether providing a weight management program to their employees will *on average* result in lower expenditures or better health, not just for those who are successful in losing weight. This is the stance of the present study. We investigated whether those who simply participated in the weight management program at the University of Minnesota reduced their health care expenditures and improved their QOL in contrast to nonparticipants. We also investigated whether participation reduced absenteeism and the types of health care expenditures—inpatient, outpatient, pharmaceutical—that it reduced if weight management was effective in reducing health care expenditures.

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METHODS

Study Setting

In 2006, the University of Minnesota implemented a health promotion program to address the issue of rising health care expenditures for individuals enrolled in the university-sponsored health insurance plan. The details of the health promotion program are documented elsewhere.[8–12] The original components of this program included disease management (telephonic health coaching for those with 11 diseases), lifestyle management (telephonic health coaching for those with risk factors such as being overweight), an online set of self-help educational programs for those with specific health issues or diseases, and a 10,000 Steps program with pedometers to encourage walking. The Fitness Rewards program (discounted health club memberships for employees and adult dependents exercising eight times per month or more) was added in 2008. In 2009, weight management was also added to encourage employees, and their spouses, to manage their weight, without condition restriction. Employees had the option of joining either a Weight Watchers program, provided on campus, or a Create Your Weight program.[24]

The Weight Watchers program offers motivational support for weight loss and maintenance in a group setting, wherein weekly meetings are led by a facilitator who has successfully completed the program. Individuals who attend 14 meetings over a 4-month period of time are eligible for reimbursement of their $159.80 payment for the program, as an incentive to participate and complete the program. Furthermore, as a member of Weight Watchers, participants can be reimbursed their costs ($159.80) three times in one calendar year up to a lifetime maximum total of six reimbursements per enrollee. The Create Your Weight program focuses more on behavior modification for living a healthy lifestyle. This program includes weekly group meetings with a defined educational curriculum, weigh-ins, encouraged food journals, and measurement of each individual's metabolism rate to personalize each individual's plan.

Data

Health care expenditures for years 2006 through 2012 were obtained from administrative claims data of employees, spouses, and dependents covered by the health insurance plans offered by the University of Minnesota (about 90% of the employees).[10] Claims data were used to calculate the monthly health care expenditures for each enrollee, averaged over the portion of a calendar year during which enrollment occurred.

To the claims data were added responses from the health risk assessment (HRA) survey completed by about 50% of employees and their spouses. Combined, these datasets contained information on the individuals' demographic characteristics, such as age and sex, work location (campus), self-reported biometric data like weight, height, and BMI, self-rated health status, whether the respondent had a disease or health risk condition and if so what the condition was, and whether or not the respondent participated in each of the health promotion programs offered by the University.

QOL weights derived from the health status question in the HRA: "What is your current health status? Excellent, very good, good, fair, or poor?" were used as an outcome of interest. Nyman et al[25] have developed QOL weights for these responses by using a crosswalk between those responses, the EQ-5D health status questionnaire responses, and the corresponding QOL weights, using data from the Medical Expenditure Panel Survey. Regression coefficients from their study were used to determine the QOL weight for each enrollee's set of demographic characteristics in the present study.

Absenteeism data, measured as average monthly hours absent from work due to all-causes during the employee year, from the years 2004 through 2010, were available only for civil service or labor-represented employees (accounting for 46% of the population covered by the University health insurance plans) who directly reported absence time.

Effect on Expenditure, Quality of Life, and Absenteeism

We estimated the effect of the weight management participation on (1) health care expenditures, and expenditures decomposed further into outpatient, inpatient, and pharmaceutical spending; (2) health-related QOL weights; and (3) the average monthly hours absent from work. As inclusion criteria, we required that employees, spouses, and dependents have at least two full years of expenditure data before their first year of participating in the weight management, and at least one full year of expenditure data for the year of participation or after. We also required that individuals be at least 18 years of age in the first year of participation. These two requirements also applied to the controls.

The participant group included individuals who participated in either of the weight management programs during any year from 2010 to 2012, and the control group included individuals who did not participate in weight management but who had expenditure data over the same years as the participants. To examine the difference between participants and nonparticipants, we first compared demographic characteristics, health care expenditures in the pre- and participation years, BMI, chronic conditions, and the status of participating in other health promotion programs between groups, using a nonparametric Kruskal-Wallis test for continuous variables and Pearson χ^2 test for dichotomous variables.

Our approach was to compare the expenditures of those who participated against the expenditures of those who did not, in the years wherein participation was possible, holding constant the expenditures of those in the two groups in the years before the program was implemented. This differences-in-differences approach is specified as:

$$Y_{it} = \gamma_0 + \gamma_{k1}X_{kit} + \gamma_{t2}T_t + \gamma_{j3}HM + \gamma_4 WM_i + \gamma_5 Post_{it} + \gamma_6(WM_i \times Post_{it}) + U_{it}$$

where Y is the dependent variable, in this case, average monthly health care expenditures for participant i in year t; X is a vector of k variables representing i's demographic data, including age, sex, BMI, work location (campus), and whether the respondent suffered from any of the 11 chronic diseases (diabetes, asthma, cardiovascular problems, congestive heart failure, arthritis, depression, osteoporosis, musculoskeletal problems, low back pain, migraines, or gastrointestinal problems) used to determine eligibility for the original disease management program; T is an indicator variable for the year; HM represents whether the individual was ever a participant in other University health promotion programs, including disease management, lifestyle management, an online self-help educational program, a 10,000 Steps program, and the Fitness Rewards program; WM represents whether the individual was a participant in weight management in any year or any combination of years; $Post$ represents the year in which an individual first participated and any years subsequent to that one, regardless of whether he or she participated in the subsequent years or not, and a comparable year for those in the control group; $WM \times Post$ represents a participator in weight management during a participation year, and is the variable of interest; U_{it} is the error term. Thus, $WM \times Post$ generates estimates of the average effect that any weight management participation over the 3 years of the program had on expenditures during the first year of participation and any subsequent years after that. Marginal contrasts were estimated from the average marginal effect, and standard errors were estimated using the delta method.

TABLE 1. Characteristics of the Analysis Sample to Evaluate the Weight Management Program*

Variables	Employees, Spouses, and Dependents			Employees Only		
	Participants	Nonparticipants	*P*	Participants	Nonparticipants	*P*
Number of observations (person-years)	4,503	259,158		4,092	90,462	
Expenditures in the pre-years, mean (SD)	$695 ($6,741)	$528 ($4,150)	**<0.05**	$691 ($6,829)	$567 ($2,379)	**<0.01**
Expenditures in the post-years, mean (SD)	$677 ($6,711)	$474 ($3,758)	**<0.05**	$678 ($6,873)	$541 ($2,337)	**<0.05**
Age, mean (SD), years	49 (10.93)	37 (32.86)	**<0.001**	49 (10.94)	46 (13.36)	**<0.001**
BMI, mean (SD)	30 (5.95)	26 (5.51)	**<0.001**	30 (5.98)	26 (5.55)	**<0.001**
Male, *N* (%)	450 (10.0)	100,491 (38.8)	**<0.001**	423 (10.3)	42,150 (46.6)	**<0.001**
Participated in other programs, *N* (%)						
Disease management	1,602 (35.6)	18,690 (7.2)	**<0.001**	1,554 (38.0)	13,530 (15.0)	**<0.001**
Life style management	1,665 (37.0)	13,719 (5.3)	**<0.001**	1,650 (40.3)	11,787 (13.0)	**<0.001**
Fitness rewards	1,692 (37.6)	28,368 (10.9)	**<0.001**	1,650 (40.3)	16.497 (18.2)	**<0.001**
Online self-help educational program	984 (21.9)	7,218 (2.8)	**<0.001**	978 (23.9)	6,177 (6.8)	**<0.001**
Ten thousand steps	1,068 (23.7)	8,712 (3.4)	**<0.001**	1,071 (26.2)	7,986 (8.8)	**<0.001**
Had chronic conditions, *N* (%)						
Diabetes	189 (4.2)	4,527 (1.7)	**<0.001**	183 (4.5)	3,048 (3.4)	**<0.001**
Asthma	1,029 (22.9)	18,363 (7.1)	**<0.001**	999 (24.4)	12,069 (13.3)	**<0.001**
Cardiovascular disease	579 (12.9)	12,156 (4.7)	**<0.001**	546 (13.3)	8,256 (9.1)	**<0.001**
Congestive heart failure	36 (0.8)	1,044 (0.4)	**<0.001**	33 (0.8)	699 (0.8)	**<0.001**
Arthritis	699 (15.5)	6,189 (2.4)	**<0.001**	675 (16.5)	4,482 (5.0)	**<0.001**
Depression	1,017 (22.6)	14,265 (5.5)	**<0.001**	1,008 (24.6)	10,080 (11.1)	**<0.001**
Osteoporosis	48 (1.1)	1,239 (0.5)	**<0.001**	45 (1.1)	828 (0.9)	**<0.001**
Musculoskeletal	447 (9.9)	7,977 (3.1)	**<0.001**	438 (10.7)	5,103 (5.6)	**<0.001**
Low back pain	2,199 (48.8)	32,115 (12.4)	**<0.001**	2,145 (52.4)	22,914 (25.3)	**<0.001**
Migraines	621 (13.8)	5,883 (2.3)	**<0.001**	621 (15.2)	4,536 (5.0)	**<0.001**
Gastrointestinal	15 (0.3)	111 (0.04)	**<0.001**	12 (0.3)	57 (0.1)	**<0.001**
Work location, *N* (%)			**<0.001**			**<0.001**
Minneapolis	2,919 (64.8)	131,427 (50.7)		2,883 (70.5)	60,723 (67.1)	
St. Paul	516 (11.5)	26,523 (10.2)		519 (12.7)	11,946 (13.2)	
Duluth	345 (7.7)	15,180 (5.9)		324 (7.9)	6,174 (6.8)	
Others	723 (16.1)	86,028 (33.1)		366 (8.9)	11,619 (12.8)	

Boldface indicates statistical significance ($P < 0.05$).
*Sample size is based on person-years.

A similar approach was taken for estimating the effect of weight management participation on QOL and absenteeism.

Because of the skew and the heteroskedastiticy in the expenditure distribution, a generalized estimating equation (GEE) model with log link and gamma distribution was used to estimate the treatment effects between weight management participants and nonparticipants. This model was also used to estimate the effect of weight management on QOL weight and absenteeism. These analyses were conducted separately for total eligible sample (employees, spouses, and dependents) and for employees only.

In addition to employing the GEE models, we conducted an alternative analysis using ordinary least squares (OLS) regression models with fixed effects, as recommended by Bertrand et al.[26] Marginal contrasts here were the coefficients of the variable of interest ($WM \times Post$). This alternative form of the differences-in-difference approach is employed to examine the robustness of our findings. We did not use a propensity score weighting strategy for the selection of the comparing groups because of the possibility that such an approach would add bias and model dependence.[27]

All expenditure data were adjusted to 2012 prices using the medical care portion of the Consumer Price Index. Analyses were performed using Stata 12.1 (Stata Corp, College Station, Texas).

RESULTS

Descriptive Statistics

Overall, 755, 628, and 763 individuals participated in a weight management program in the years 2010, 2011, and 2012, respectively, representing 1,501 unique individuals when combined all 3-year data (Table 1). Results from bivariate analyses indicated that individuals who had participated in weight management were older, had a higher BMI, were more likely to be female, and were likely to have chronic disease, as indicated by higher percentages in each of the chronic conditions than nonparticipants. Weight management participants were also more likely to have participated in other health promotion programs and had higher health care expenditures both in the pre-year and participation periods. Because the participation years covered 3-year spans, values are presented in terms of person-years. For analyses including employees only, for example, person-year observations for nonmissing values for each variable were 40,218, 40,295 and 13,305 for health care expenditure, QOL weight, and absenteeism, respectively.

Effect on Expenditures

Tables 2 and 3 present the effect of participation on the health care expenditures for employees, spouses, and dependents as a whole and for employees only. The results indicate that participation in the weight management program generated $69 [95% confidence interval (CI), $9 to $130] in monthly savings for all participants and $73 (95% CI, $13 to $133) in monthly savings for employee participants only. Annualized, these savings represent $828 and $876, respectively.

In addition to the impact on total health care expenditures, we assessed the effect of participation on the three components: outpatient, inpatient, and pharmaceutical spending. No significant differences were found between participants and nonparticipants regardless of analysis samples.

TABLE 2. Effects of Weight Management Participation on Monthly Health Care Expenditures for Employees, Spouses, and Dependents

Variable*	Total Expenditures†	Outpatient	Pharmaceutical
Participator	−0.062 (−0.169, 0.046)	−0.055 (−0.160, 0.049)	−0.110 (−0.263, 0.044)
Post	0.001 (−0.267, 0.269)	−0.032 (−0.273, 0.208)	0.153 (0.035, 0.271)
Participator × Post	−0.145[a] (−0.279, −0.010)	−0.105 (−0.231, 0.021)	−0.143 (−0.328, 0.041)
Estimated marginal effect	−$69.22 (−$129.55, −$8.89)	−$35.13 (−$75.27, $5.02)	−$11.46 (−$25.27, $2.34)

*In the analysis on inpatients expenditure, the GEE model was unable to converge, and thus the result was not shown.
†Total health care expenditures are the sum of outpatient, inpatient, and pharmaceutical spending.
[a]$P < 0.05$.

Effect on Quality of Life

Because the imputation of QOL weight was based on the self-rated health status from the HRA survey, this analysis was restricted to employees only. Table 3 indicates that QOL weight for participating employees was 0.0045 points (95% CI, 0.0012 to 0.0078) higher than nonparticipating employees over all 3 years of participation. This improvement in QOL weight is roughly equivalent to the improvement that would be generated by the avoidance of a visual disturbance (ICD9-368) or the avoidance of noninflammatory disorders of the ovary fallopian tube and broad ligament (ICD9-620).[28]

Effect on Absenteeism

No significant difference between participants and nonparticipants was found for the average number of hours absent from work. This is likely due to the small sample size because our sample of those receiving hourly wages was only about one-third as large as the sample of employees used in the analysis of health care expenditures.

Total Benefits

We further calculated the total benefit of the weight management program from savings in health care expenditures and increases in QOL weight. Our analysis found that the reduction in expenditures persisted after an individual's initial participation in the program regardless of whether they actively participated in those subsequent years or not. Therefore, an estimate of the total savings generated from participation in the program can be derived by the product of the average $828 annual savings of participating in weight management and the 4,503 participant years of the total eligible sample (employees, spouses, and dependents). Thus, the program generated a total savings of $3,728,484 over a 3-year period. Likewise, the program was found to generate 18.414 total QALYs for all 4,092 employee participant years (with a factor of 0.0045 per participant year). If an additional QALY is worth $50,000,[29] this would add $920,700 worth of health gains to the $3,728,484 of health care cost savings for a total benefit of $4,649,184. Furthermore, on the basis of the estimated annual costs of $163,947 ($150,654∗3.7/3.4) (inflated to 2012 dollars) for the Weight Watchers program from our previous study,[11] an average return on investment (ROI) could be derived as 7.6. Of note, this ROI estimate was simply for reference purpose, because only the direct costs for the program, such as the reimbursement to participants that is paid as an incentive, were included. Also, it might not be possible to separate the costs of weight management from the overall health promotion programs due to the overlapping personnel or infrastructures.

Sensitivity Analyses

Table 4 summarizes the results using OLS regression models with fixed effects. We found a significant difference between the participants (employees, spouses, and dependents or employees only) and nonparticipants for total health care expenditures and QOL weights. The estimated marginal effects were similar to what we found in the analyses using GEE models. This sensitivity analysis suggests that cost reductions observed in the primary analyses are reasonably robust.

DISCUSSION

Our results indicated that participation in a weight management program was effective in reducing total health care expenditures and improving QOL, but did not appear to affect absenteeism. Such a finding raises the question as to what extent can weight management translate into health care expenditures. To shed some light on this issue, we regressed expenditures on the amount of weight lost by participants (the mean BMI was 30), but did not find a significant relationship, consistent with other studies.[20,22] Another

TABLE 3. Effects of Weight Management Participation on Monthly Health Care Expenditures and Quality of Life Weight for Employees Only

Variable*	Total Expenditures†	Outpatient	Pharmaceutical	QOL Weight‡
Participator	−0.05 (−0.158, 0.057)	−0.046 (−0.153, 0.020)	−0.101 (−0.255, 0.053)	0.0008 (−0.003, 0.005)
Post	−0.001 (−0.266, 0.263)	−0.032 (−0.270, 0.206)	0.138 (0.020, 0.256)	−0.003 (−0.010, 0.003)
Participator × Post	−0.154[a] (−0.288, −0.019)	−0.116 (−0.241, 0.010)	−0.133 (−0.317, 0.050)	0.006[b] (0.002, 0.010)
Estimated marginal effect	−$73.20 (−$132.99, −$13.41)	−$38.42 (−$78.20, $1.35)	−$10.79 (−$24.83, $3.24)	0.0045 (0.0012, 0.0078)

QOL, quality of life.
*In the analysis on inpatients spending, the GEE model was unable to converge, and thus the result was not shown.
†Total health care expenditures are the sum of outpatient, inpatient, and pharmaceutical spending.
‡The analysis of QOL weight was conducted on the sample of employees only because only employees are eligible for Health Risk Assessment survey.
[a]$P < 0.05$.
[b]$P < 0.01$.

TABLE 4. Sensitivity Analysis Results of Marginal Effects Using Ordinary Least Squares Regression Models With Fixed Effects

Outcomes of Interest*	Employees, Spouses, and Dependents ($n = 11{,}005$)	Employees Only ($n = 10{,}606$)
Total health care expenditures†	−$69.15[a] (−$136.66, −$1.65)	−$70.52[a] (−$138.20, −$2.84)
Outpatient	−$35.80 (−$80.39, $8.78)	−$36.63 (−$81.40, $8.13)
Inpatient	−$25.17 (−$51.15, $0.81)	−$26.23[a] (−$52.24, −$0.23)
Pharmaceutical	−$8.18 (−$19.97, $3.62)	−$7.65 (−$19.47, $4.16)
Quality of life weight	0.004[a] (0.0008, 0.007)	0.004[a] (0.0008, 0.007)

*Value shown here were the coefficients of the variable of interest using ordinary least squares regression models. They were also the marginal effect of the outcome of interests.
†Total health care expenditures are the sum of outpatient, inpatient, and pharmaceutical spending.
[a]$P < 0.05$.

study that examined the impact of weight gain or loss on health care costs suggested that preventing weight gain in participants was a more likely explanation than actual weight loss.[20] These inconclusive findings suggest that the mechanism by which weight change affects cost savings remains a puzzle, although a weight loss of at least 5% is commonly used as a benchmark for clinical health benefits.[23]

Findings from recent studies differ regarding the specific elements of workplace wellness programs that are associated with cost savings. Many studies have found that disease management reduced health care costs. Because hospitalizations are so costly, the prevention of only a small proportion of hospitalizations among those with existing diseases would show that disease management is effective.[1] And, even though lifestyle management programs, such as smoking cessation or stress reduction, have generally less immediate effects or have been shown not to be as effective, the effectiveness of a certain type of lifestyle management, such as weight management, might exhibit its effectiveness through prevention of disease. For example, those at a high risk of diabetes or those in the pre-diabetes category might have avoided a full-fledged diagnosis by participating in a weight management program.[16,17]

Yet, the evaluation of workplace wellness programs is not always about cost-effectiveness or saving money. Researchers have advocated the necessity of finding a better way to measure the health and financial impact of workplace wellness or health promotion programs.[2] Workplace wellness programs generate a range of indirect benefits that provide substantial value to employers.[30] The improvement of QOL after weight management participation in our study could translate into an increase in employee engagement, greater job satisfaction, and improved productivity,[31–33] which were not measured in the present study. These measures capture value beyond monetary benefit and could be examined as alternative measures of program impact in future studies.

To our knowledge, ours is the first study to evaluate the effect of weight management directly on an individual's QOL measurement. Bilger et al[21] found that employees who had at least a 5% weight loss experienced a 0.026 point increase in QOL, as measured by the EQ-5D-3L questionnaire. In comparison, our study showed that employees who participated in a weight management program experienced a 0.0045 point increase in QOL, regardless of whether participants had achieved 5% weight loss or not.

Several limitations in the present study need to be noted. First, this study did not use a propensity score matching to generate our comparison group due to the controversy of this method.[27] The fact that our alternative regression specification generated similar results suggests that our findings are robust. Second, it is challenging to isolate the effect of weight management participation from the effects of other programs because a high percentage of the participants also enrolled in the other programs, such as disease management. Third, we were not able to distinguish the effects of weight management in terms of engagement levels among participants. Presumably, employees with a higher degree of commitment are those who may care more about their health conditions. Their overall perception about health might be improved even though they did not have significant weight loss results. Future evaluations including the elements of engagement, productivity, or satisfaction levels may shed a light on the benefits other than the monetary values. Fourth, although we found a significant impact of weight management program participation on total health care expenditure, this effect became nonsignificant when the total health care expenditure was broken into outpatient, inpatient, and pharmaceutical spending. The borderline nonsignificance was found for outpatient and pharmaceutical spending analyses along with the relatively small sample size of the participation versus control group (4,092 vs 90,462 person years) in our study. A future study with larger sample sizes should help clarify this issue. Finally, our results may not be generalizable to settings outside the University of Minnesota.

In summary, the workplace weight management program used by University of Minnesota employees reduced their health care expenditures and improved their QOL.

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