

## Financial impact of a comprehensive multisite workplace health promotion program

Steven G. Aldana, Ph.D.,<sup>a,\*</sup> Ray M. Merrill, Ph.D., M.P.H.,<sup>b</sup> Kristine Price, M.S.,<sup>a</sup>  
Aaron Hardy, M.S.,<sup>c</sup> and Ron Hager, Ph.D.<sup>a</sup>

<sup>a</sup>Department of Physical Education, College of Health and Human Performance, Brigham Young University, Provo, UT 84602-2214, USA

<sup>b</sup>Department of Health Science, College of Health and Human Performance, Brigham Young University, Provo, UT 84602-2214, USA

<sup>c</sup>Washoe County School District, Reno, NV 89501, USA

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### Abstract

**Introduction.** The purpose of this study is to determine if the Washoe County School District Wellness Program impacted employee health care costs and rates of absenteeism over a 2-year period.

**Methods.** Outcome variables included health care costs and absenteeism during 2001–2002. Data were collected on 6246 employees over a 6-year period from 1997–2002. Baseline health claims costs and absenteeism from 1997–2000, age, gender, job classification, and years worked at the school district were treated as covariates. Logistic regression was used to compare 2-year costs and absenteeism rates between nonparticipants and employees who participated for 1 and 2 years.

**Results.** No significant differences in health care costs were found between those who participated in any of the wellness programs and those who did not participate. There was a significant negative association between participation and absenteeism; program participants averaged three fewer missed workdays than those who did not participate in any wellness programs. The decrease in absenteeism translated into a cost savings of US\$15.60 for every dollar spent on the program.

**Conclusions.** After controlling for several confounding variables, wellness program participation was associated with large reductions in employee absenteeism.

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### Introduction

Approximately 90% of all workplaces in the United States with 50 or more employees have some form of health promotion program [1]. Companies invest in health promotion programs for various reasons. Some corporations go to great efforts to create a corporate climate and culture designed to support their employees. These businesses make employee satisfaction and a sense of community important components of their corporate structure and culture. Health promotion programs in these settings are focused on helping employees stay healthy, satisfied, and productive. Saving the company

valuable financial resources may be viewed as an additional benefit of the health promotion program, but having a positive return on investment is not a requirement [2].

Many corporations use health promotion programs as a reactionary effort to curtail ever increasing employee-related expenses, mainly health care costs and lost productivity. In 2003, health care costs for companies across the United States increased an average of 13.9%, the largest single-year increase since 1990 [3]. In the Western United States, the increase was 16.3%. In that same year, the premiums for employer-sponsored health plans rose to US\$3383 for single coverage and US\$9068 for family coverage. As companies continue to bear these costs, they will look for additional ways to reduce employee-related expenses.

Most health promotion programs adhere to the premise that most causes of premature death and disease are related to lifestyle and can be prevented [4]. Health promotion pro-

\* Corresponding author. Department of Physical Education, College of Health and Human Performance, Brigham Young University, 276 SFH, Provo, UT 84602-2214.

E-mail address: [steve\\_aldana@byu.edu](mailto:steve_aldana@byu.edu) (S.G. Aldana).

grams are designed to help individuals prevent disease and premature death and enjoy a high quality of life. This is accomplished by helping individuals alter lifestyle behaviors in such a way that high health risks are reduced and low risks are maintained. If major causes of disease and premature death can be prevented, it is generally accepted that some of the costs associated with treating those diseases can also be prevented or at least greatly reduced. Therefore, health promotion efforts could potentially have a dramatic impact on employee health care expenses. In addition to health-related expenses, health promotion efforts are thought to have an impact on employee absenteeism, resulting in further benefits for companies that provide comprehensive health promotion programs [5]. The purpose of this study was to determine if the Washoe County School District (WCSD) Wellness Program has impacted employee health care costs and rates of absenteeism over the short-term, defined as a 2-year period, 2001 and 2002.

## Methods

This study was conducted with the employees and retirees of the WCSD located in the Reno, Nevada, metropolitan area. Approval for this study was obtained from WCSD and the institutional review board at Brigham Young University. The study was also supported by each of the district's employee associations: the classified association for support staff, such as bus drivers and custodians, and the certified association for teachers.

### *Study population*

Analyses were based on employees and retirees of the WCSD for the Years 1997 to 2002. Employees were eligible for the study if employed full time with the District 3 or more years, including 2001 and 2002. Approximately 95% of all district employees were insured by the WCSD health plan. Data on employees not covered by the plan were not available, and it was not possible to make comparisons between insurance plan participants and nonparticipants. Of 9216 individuals employed and insured by the district during the study period, 6246 met the minimum 3-year continuous employment criterion. Of this final number, 1441 (23.1%) were retired. For each individual in the study, absenteeism, health care cost claims, and health promotion program participation data were collected. Retired employees did not have absenteeism data.

### *Health promotion program*

The Wellness Program was developed by the District's Insurance Committee in response to the increasing medical cost and premium experience within its self-funded insurance plan. It was approved by all employee groups. During 2001 and 2002, the WCSD WP offered 11 different wellness

programs designed to encourage employees to engage in healthy lifestyles. The programs were offered to all employees, dependents, and retirees. Employees were dispersed over a large geographical area but were concentrated at the 90 schools or buildings within the district. Because of the decentralized nature of the employees, all wellness programs were promoted via the internet and email. For each of the programs, participants were asked to complete both baseline and follow-up evaluations specific to the objectives and goals of programs. The following is a brief description of the different programs in which employees could participate during the 2001–2002 timeframe. A more detailed description of the programs can be found at the WCSD Wellness Program Website: <http://www.washoe.k12.nv.us/wellness>.

### *Brighten your smile*

Participants committed to brush twice and floss once daily.

### *Holiday weight challenge*

Offered in both years, this program encouraged responsible energy intake and expenditure during the holiday season. Participants weighed themselves before Thanksgiving and after New Year's and received a prize if weight was maintained.

### *H<sub>2</sub>O challenge*

This challenge promoted awareness about dehydration and protection against heat-related conditions.

### *Tame the TV*

Offered in 2001 and 2002, this challenge focused on substituting healthier activities for TV watching.

### *March nutrition mystery*

Clues to crack a mystery became available as participants ate five servings of fruits and vegetables daily.

### *Mount Everest fitness challenge*

Each team moved a certain distance up web-based map to the top of Mount Everest, by exercising, complying with the Food Guide Pyramid, and getting adequate rest, in an effort to reach the finish line as a group.

### *Test your rest*

Participants committed to obtaining a 7- to 9-h block of sleep every day for a month.

### *Ironman triathlon fitness challenge*

Each team moved along the course as a group, with the distance moved determined by team points for exercising, daily water and fruit and vegetable intake, and getting adequate sleep.

### *Train your brain*

Participants committed to read a few minutes each day.

### *Exercise for life*

Participants committed to 8 weeks of exercise, in compliance with the Surgeon General's recommendation of 30 min of moderate exercise, 5 days a week.

### *Buckle up America!*

Participants committed to buckle themselves and other vehicle occupants whenever they were in a car during a given month.

To participate in a wellness program, individuals enrolled online or in person at any of the different district schools or facilities. Information from participants who signed up online was archived and later added to the participation data from each of the different programs. Information from participants who signed up in person was collected using registration materials and later manually added to the master participation data set. The final participation data set included participant ID, year, and the program in which the employee participated. Adherence was self-reported at the completion of each program, while participation was determined by tracking the enrollment and program completion information submitted by participants. Most of the incentives offered to participants were only made available if participants reported that they completed the various programs.

### *Measures*

Two outcome variables were considered: health care costs and absenteeism. Primary focus was on whether health care costs and absenteeism rates for 2001 and 2002 differed according to participation in the wellness programs, after adjusting for selected potential confounding factors, including baseline health care costs and absenteeism for 1997–2000. Separate data files were available for health care costs, absenteeism, and participation in the wellness programs. These data files were linked by an assigned research identification number. No personal identifying information was made available to the researchers.

Health care costs were based on employee claims data. The WCSD processed over 750,000 individual claims between 1997 and 2002. Claims directly associated with maternity were excluded. The Consumer Price Index for the greater Reno metropolitan area was used to adjust all claim dollar amounts to 2002 dollars. A detailed method of reporting absenteeism is used by WCSD. Absenteeism as used in this evaluation was defined as paid work time missed due to personal illness and medical leave excluding absenteeism used to care for a family member, vacation leave, disability leave, and bereavement. Absenteeism per employee per year was reported in hours by the Human Resource Department. Annual average claims data and average annual days missed were combined into quartiles for the baseline years (1997–2000) and the intervention year (2001–2002).

Program participation involved enrollment in one or more of the wellness programs during 2001 or 2002. A new variable was created that identified whether individuals participated in none of the programs (0), participated in any program(s) in only one of the years (1), or participated in any programs for 2 years (2).

Age was divided into five categories delineated by decade 20–29, 30–39, 40–49, 50–59, and 60 or greater. All district employees were categorized according to job type. Teachers and administrators were grouped as certified employees; staff members, bus drivers, cafeteria workers, and facilities personnel were grouped as classified employees; and retired employees were classified as retired. The number of years (3, 4, 5, or 6 years) district employees had been continually employed during the 6-year period between 1997 and 2002 was used to quantify years worked.

### **Statistical methods**

Cross-tabulations were used to perform bivariate analyses between selected variables, with statistical significance based on the chi-square test for independence ( $\chi^2$ ) [6]. The *F* statistic was used in analysis of variance for testing the null hypothesis of equality of means [7]. Treating the categorized claims and absenteeism data for 2001–2002 as the response outcomes, cumulative logits were modeled by performing ordered logistic regression using the proportional odds model [8]. These variables were separately regressed on wellness participation adjusting for age, sex, job type (certified, classified, or retired), years worked, and in the claims model 1997–2000 claims data and in the absenteeism model 1997–2000 absenteeism data. Two-sided tests of significance and confidence intervals were based on the 0.05 level. Analyses were performed using SAS Version 8.2 (SAS Institute Inc., Cary, NC, USA, 2001). Procedure statements used in SAS for assessing the data were PROC FREQ, PROC UNIVARIATE, and PROC LOGISTIC.

### **Results**

Of the 6246 employees eligible for the study, 1407 (22.5%) participated in the wellness program in either 2001 or 2002, and 1264 (20.2%) participated in the wellness program both years. Bivariate analyses of the association between wellness participation and age, gender, job type, and years worked is presented in Table 1. The majority of employees were 50 years and older, female, had a certified job classification, worked at least 6 years, and had not participated in any of the wellness programs. One- and two-year wellness participation was highest in the age group 30–39 and lowest in the age group 60 years and older. For the other age categories, wellness participation in one or both years ranged from 44–50%. Females were

Table 1  
Frequency distributions of 6246 WCSO employees according to participation in the wellness program and selected variables

	No participation in 2001 or 2002		Participation in 2001 or 2002		Participation in 2001 and 2002		$\chi^2$ , <i>P</i> value
	No.	%	No.	%	No.	%	
<i>Age<sup>a</sup></i>							
20–29	153	49.7	90	29.2	65	21.1	461.9,
30–39	453	41.9	339	31.4	289	26.7	<0.001
40–49	747	50.0	376	25.1	372	24.9	
50–59	1063	55.6	421	22.0	427	22.3	
60+	1159	79.9	181	12.5	111	7.6	
<i>Gender</i>							
Males	2278	51.6	1076	24.4	1057	24.0	208.3,
Females	1297	70.7	331	18.0	207	11.3	<0.001
<i>Job type<sup>b</sup></i>							
Certified	1594	46.0	952	27.5	916	26.5	590.0,
Classified	777	58.3	283	21.2	273	20.5	<0.001
Retired	1198	83.1	168	11.7	75	5.2	
<i>Years worked</i>							
3	214	44.6	130	27.1	136	28.3	54.9,
4	185	52.3	102	28.8	67	18.9	<0.001
5	212	53.9	109	27.7	72	18.3	
6	2964	59.1	1066	21.2	989	19.7	

Percentages were derived according to rows.

<sup>a</sup> Represents the individual's age in the year most recently employed.

<sup>b</sup> Ten individuals with a leave of absence (LOA) classification were not included.

more likely than males and certified workers more likely than classified or retired workers to participate in the wellness program for 1 or 2 years. Wellness participation,

either one or both years, decreased with more years worked.

The brighten your smile program included 166 participants (3% of eligible participants) who reported a significant increase in flossing and minutes of brushing. The holiday weight challenge was offered during the holidays from Thanksgiving to New Year's in 2001 and 2002 and included 1761 (27%) unique participants. Ninety-one percent reported no weight gain during the holidays, and those who reported losing weight lost 2.5 lb on average. The H<sub>2</sub>O challenge, tame the TV, march nutrition mystery, test your rest, train your brain, and buckle up America! programs had a total of 2736 participants or 34% of all district employees. The Mount Everest fitness and wellness challenge, ironman triathlon fitness challenge, and exercise for life programs had 3288 unique participants (63% of total eligible employees) who reported 90% compliance to dietary and exercise recommendations. Depending on the program, program completion rates ranged from 62% and 82%, as determined by completion cards participants submitted to the Wellness Program at the end of each program.

Table 2 presents annual individual medical claims and absenteeism days averaged for the Years 2001 and 2002 by selected variables. Health care costs were significantly higher in those 50 years of age and older and among retired employees. Differences in health care costs between males and females and across years of work were not statistically significant. Only certified and classified employees are considered in the absenteeism data found in Tables 2 and 4. The number of missed workdays averaged for the Years 2001 and 2002 significantly varied across the levels of each of the variables (Table 2). Number of days of work missed

Table 2  
Bivariate analyses of annual individual medical claims cost and absenteeism days averaged for 2001 and 2002 by selected variables<sup>a</sup>

	Medical claims cost				Absenteeism days			
	No.	Mean	Standard error	<i>F</i> statistic, <i>P</i> value	No.	Mean	Standard error	<i>F</i> statistic, <i>P</i> value
<i>Age</i>								
20–29	308	2022	494	10.5, <0.001	301	9.6	0.64	22.3, <0.001
30–39	1081	1982	263		1056	11.9	0.34	
40–49	1495	1941	224		1448	13.0	0.29	
50+	3362	3240	149		1905	14.1	0.25	
<i>Gender</i>								
Males	4411	2382	203	2.5, 0.114	3430	14.5	0.31	33.9, <0.001
Females	1835	2763	131		1280	12.4	0.19	
<i>Job type<sup>a,b</sup></i>								
Certified	3462	2136	147	14.9, <0.001	3389	9.0	0.16	2302.2, <0.001
Classified	1333	2693	237		1321	23.3	0.25	
Retired	1441	3796	228		–	–	–	
<i>Years worked</i>								
3	480	1725	396	2.3, 0.071	457	9.7	0.52	20.5, <0.001
4	354	2743	461		338	11.0	0.60	
5	393	2283	438		379	13.4	0.57	
6	5019	2762	122		3536	13.6	0.19	

<sup>a</sup> Retired individuals did not have absenteeism data.

<sup>b</sup> Ten individuals with a leave of absence (LOA) classification were not included.



increased with age and years worked and was higher among males and classified employees.

Annual individual medical claims averaged for the Year 2001 and according to wellness participation is presented in Table 3. Estimates are adjusted for those variables significant in both Tables 1 and 2. There was no statistical association between 2001 and 2002 wellness participation and medical claims. Results from the parametric and nonparametric analyses shown in the table provide consistent results.

Days of missed work averaged for the Years 2001 and 2002 according to wellness participation is presented in Table 4. Estimates are adjusted for those variables significant in both Tables 1 and 2. Days of missed work significantly decrease with the level of wellness participation. Analysis of means and odds ratios provide consistent results.

#### Cost–benefit analysis

On average, the WCSD paid US\$231/day and US\$103/day for every certified and classified employee, respectively, who was absent due to illness. In addition, US\$75/day was spent to hire substitutes needed to fill in for critical employees who were absent. Table 2 shows the mean absenteeism days missed by wellness program participants. If nonparticipants are treated as the reference group, savings in absenteeism costs for employees who participated in programs for 1 year and 2 years can be calculated. Using average absenteeism daily costs for WCSD, job type, payment for substitutes, and number of program participants, it is estimated that program participation was associated with a US\$3,041,290 difference in absenteeism costs during 2001 and 2002 when compared with nonparticipants. This value is 15.6 times greater than the total program cost for all wellness programs during this same time period. These program costs included wellness staff, benefits, program costs, and all other costs associated with the program. These savings translate into a cost savings of US\$15.6 for every dollar spent on programming.

Table 3  
Annual individual medical claims averaged for the Years 2001 and 2002 according to wellness participation

	No.	Baseline mean <sup>a</sup>	Pairwise <i>t</i> test, <i>P</i> value	Odds ratio <sup>b</sup>	95% Confidence interval
Wellness participation					
None	3575	2621	0.380 (1 vs. 2)	1.00	Referent
1 year	1407	2853	0.221 (2 vs. 3)	1.04	0.92, 1.17
2 years	1264	2458	0.564 (1 vs. 3)	1.06	0.94, 1.20

<sup>a</sup> Based on regression analysis adjusting for age, job type, and average medical claims before the wellness program (1997–2000).

<sup>b</sup> Based on multiple logistic regression analysis (polytomous response) adjusting for age, job type, and average medical claims before the wellness program (1997–2000).

Table 4  
Annual individual days of missed work for the Years 2001 and 2002 according to wellness participation

	No.	Mean <sup>a</sup>	Pairwise <i>t</i> test, <i>P</i> value	Odds ratio <sup>b</sup>	95% Confidence interval
Wellness participation					
None	2309	15.4	0.300 (1 vs. 2)	1.00	Referent
1 year	1224	15.1	0.019 (2 vs. 3)	0.92	0.80, 1.05
2 years	1177	14.3	0.000 (1 vs. 3)	0.80	0.70, 0.92

<sup>a</sup> Based on regression analysis adjusting for age, gender, job type, years worked, and average days of missed work (1997–2000).

<sup>b</sup> Based on multiple logistic regression analysis (polytomous response) adjusting for age, gender, job type, years worked, and average days of missed work (1997–2000).

## Discussion

The results of this study indicate that there are no short-term differences in health care costs between those who participate in voluntary wellness programs and those who do not, but there is a graded and significant difference in absenteeism among those who participate in voluntary wellness programs as opposed to those who do not participate. Nonparticipants had higher rates of illness-related absenteeism than did employees who participated in any program(s) during any 1 year and considerably higher rates of absenteeism compared to those who participated in any programs over a 2-year period.

One of the most common reasons worksites implement a health promotion program is to combat the ever increasing employee health care cost burden. During the 2-year period covered by this study, no differences in health care costs were observed. These results are mirrored by other findings. In a comprehensive review of the financial impact of health promotion programs, Aldana [2] reported that 32 different published evaluations addressed this issue. Of these studies, 12 had an evaluation period of 3 years or less and these provided mixed results. Some of the studies reported no difference in health care costs between program participants and nonparticipants during less than 3-year follow-up periods [9–14]. Goetzel et al. [11] did report that in Year 3, participants experienced lower health care costs. The results of a recent short-term study [15] found that older adults who initiate a physically active lifestyle have significantly lower short-term health care charges than those who remain inactive.

These findings support the theory that improvement of health risks through worksite health promotion program participation may have a limited effect on short-term health care costs, but they may be more financially beneficial with the passage of time as more costly chronic diseases are prevented.

Other studies [16–21] reported that short-term reductions in health care costs were associated with program participation. Although each of these studies used a different worksite research setting, they all provide a common observation. It appears that participation in worksite health

promotion programs is eventually associated with lower health care costs. All but two of the published studies [22,23] that tracked health care costs for longer than 3 years reported significantly lower health care costs for program participants and indicated that the longer the follow-up time, the more substantial the savings [2]. As yet, it is still unknown precisely when improvements in individual employee health risks will begin to reduce employee health care costs. Although the WCSD did not experience short-term differences in participant health care costs, it is possible that the overall health care cost experience of the district was lower than the overall health care costs of comparable worksites which do not have health promotion programs.

Reducing employee absenteeism is another effective way to reduce employee-related expenses [24]. Large organizations such as WCSD use a large number of resources employing substitute teachers and laborers who are filling in for full-time employees who are absent due to illness.

The majority of studies published on the effects of a health promotion program on short-term absenteeism rates demonstrate that participants have lower levels of absenteeism than do nonparticipants, with reductions of approximately 3% to 16% [2]. Findings from the present study indicate that individuals who participated in wellness programs at both years had a 20% difference in absenteeism compared with those who did not participate in the programs. The economic benefit associated with a 20% difference in absenteeism is substantial. This was associated with a cost–benefit ratio of 15.6. Three previously published cost–benefit ratios that looked at health promotion programs and absenteeism savings ranged from 2.5 to 10.1 [25–27]. One of the primary reasons this ratio is so high is because the programs offered at WCSD are primarily web-based. This allows for maximum participation with relatively little cost associated with communication, program recruitment, and evaluation.

Health promotion program participation is a well-accepted method of helping employees lower chronic disease risk factors. Lower risk factors could lead to improved short- and long-term health, and better health could be the driving factor behind these lower rates of absenteeism. However, it is also possible that participants in the voluntary wellness programs felt a greater sense of devotion to their employer and were therefore less apt to miss work than those who did not participate in the programs. It is not known if the differences in absenteeism are related to improvements in health versus employee morale.

The large number of participants, the cohort study design, and the nonparametric analyses adjusted for selected confounding variables. Baseline health care costs and absenteeism rates for 1997–2000 were included as covariates in an effort to ameliorate selection bias. Despite this, there are some potential limitations that need attention. Participation in the wellness programs was voluntary. Employees who chose to participate in any of the programs could have

possessed other characteristics that predisposed them to lower rates of absenteeism. They could have been self-motivated and may have experienced less absenteeism without program participation, although a dose–response effect and control for baseline health care costs and absenteeism lessen this alternate explanation. In the same fashion, those who chose to participate could have had poor health and higher health care costs, masking any differences in health care costs caused by program participation, although baseline health care costs help to ameliorate this problem. Program adherence and completion were self-reported. Incentives and tracking systems were used to encourage participation, but because of the self-reported adherence data for measures such as body weight, it is not possible to reliably quantify any intervention effects.

Findings from this study indicate that in a school district setting, voluntary wellness programs do not appear to be related to immediate health care costs. Absenteeism rates, however, appear to be related to a 20% difference on average. Based on differences in absenteeism, the cost of the district's wellness program is more than offset by the apparent savings in absenteeism. Long-term follow-up is needed to determine if reductions in health care costs will appear in the future.

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