



Finally, a wellness design breaks through the barrier of insufficient evidence. This peer-reviewed and internationally-published article describes this design.

International Journal of Workplace Health Management

“An evaluation of a comprehensive, incentivized worksite health promotion program with a health coaching component”

A new internationally-published study proves companies can **lower healthcare costs and improve the health and productivity of employees**, through a unique accountability-based wellness program design. This unique wellness model incorporates biometric testing, individualized health coaching, and a personal wellness profile with a financial incentive. The article shows how this unique program, designed and administered by *Orriant*, provides measurable, impactful, and positive results.



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If you want measurable results, your wellness program must include 6 critical elements:

1. Use Best Practices

Use the best practices of behavioral change.

The best practice of influencing lifestyle change was at the core of the design. Personable health coaches developed rapport and trust and then used powerful questions to engage people in their own self-directed change.

"The coach did not prescribe a set of goals, but rather engaged the person in deciding for themselves what physical activity and nutritional goals they were willing and ready to start working on." (Page 76)

89-90% of Wellness Participants

Agreed or Strongly Agreed their Coach was:

- Very Helpful in Educating
- Knowledgeable and Professional
- Caring and Compassionate

(Page 79)

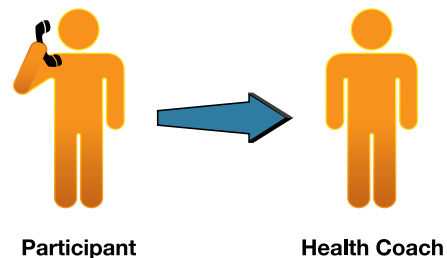
2. Be Accountability-Based

Individual accountability must be an integral part of the program design.

The design of the program was accountability-based, which was well-received by the participants. Most participants had health risks and were required to engage in new behaviors to address those risks, or lose a sizable insurance discount.

"It was the participant's responsibility to contact the health coach." (Page 78)

"Response to regular contact with a coach was very positive." (Page 79)



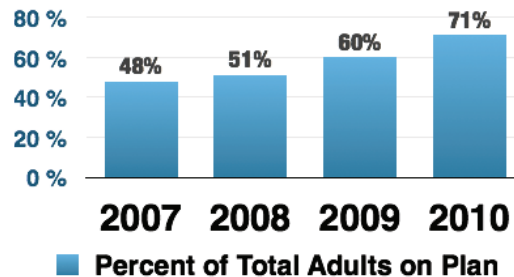
3. Engage the Majority

Engage the majority of adults on your health plan, not just your employees.

Participation increased over time as the majority got involved. A significant portion of the population was meaningfully engaged in changing behaviors.

"The level of employee and spouse participation in the comprehensive, incentivized worksite health promotion program steadily increased over the study period." (Page 80)

Wellness Participation Amongst ALL Adults

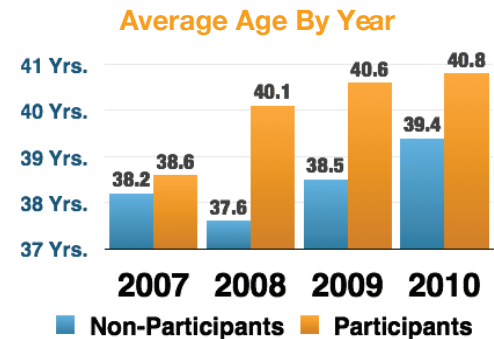


4. Engage Older Adults

Engage those age 40+ in wellness, who typically have higher costs and claims.

There was high participation amongst age-groups who needed it the most and often don't participate in wellness.

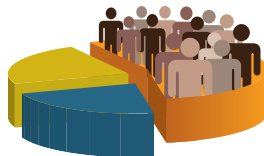
"Participants had a significantly older age than non-participants in 2008-2010." (Page 80)



5. Motivate the Majority

Motivate the majority to make real change through health coaching.

The number of individuals in contact with a health coach was very high.



"In some situations, over 50 percent of all the insured adults associated with the companies were being held accountable to work with a coach on an ongoing basis until they no longer had the risks." (Page 85)

Motivation To Improve

80%

of wellness participants agreed or strongly agreed their coach motivated them to improve their health. (Page 79)

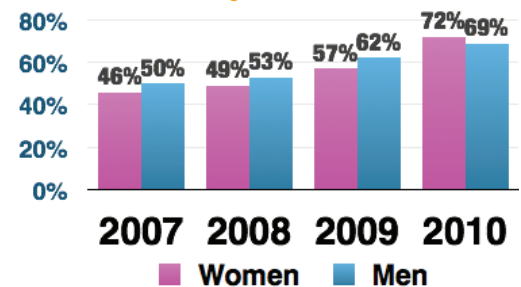
6. Engage the Men

Engage the men, not just the women.

The program was successful at getting more men involved, three out of the four years.

"Participation rates were slightly higher for men than women in the years 2007-2009." (Page 80)

Participation Rates Per Year By Gender



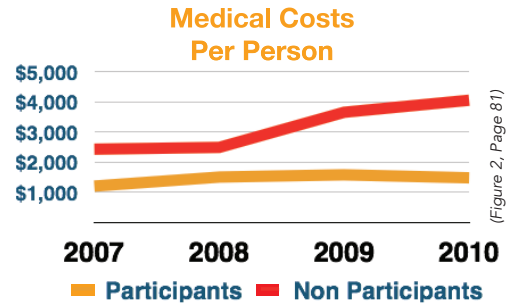
The study shows the following measurable results:

1. Lower Medical Costs

Lower overall cost of healthcare.

Wellness participant's cost of claims increased at a lower rate.

"Medical costs among participants were lower and increased at a lower rate than among nonparticipants." (Page 80)



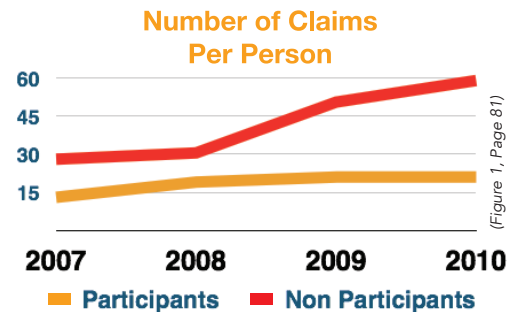
(Figure 2, Page 81)

2. Lower Utilization

Lower number of claims per participant, per year.

Wellness participants had fewer claims per person.

"The frequency of healthcare claims per person started lower and increased at a lower rate among participants than nonparticipants." (Page 80)



(Figure 1, Page 81)

3. Lower Heart Disease

Significantly reduce risk factors for heart disease – the #1 killer of Americans.*

Dangerous blood pressure levels decreased by an average of 69-70%, reducing the risk of heart disease.

*"Systolic: 169.9 mmHg down by 34.4 in 3 years"
"Diastolic: 105.3 mmHg down by 17.7 in 3 years"
(Page 82)*

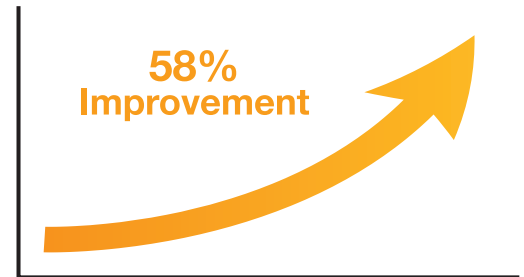


4. Lower Diabetes Risk

Significantly reduce the risks of unmanaged Diabetes.

Dangerous blood glucose levels decreased by an average of 58%, reducing the risks associated with diabetes.

"Glucose of ≥ 126 mg/dL: 164.4 down by 31.3 in 3 years" (Page 82)



5. Lower Cancer Risk

Significantly reduce the risk of cancer through improved lifestyle choices.

According to the study, wellness participants were ranked, based on their lifestyle choices, on a scale of 1-100 (100 being the healthiest). Those at the greatest risk for cancer improved their lifestyle score by nearly 32 points, or 41%.

"Cancer Score <25: 23.3 up by 31.8 in 3 years." (Page 83)



*"Workplace wellness programs logically should improve employee health but **until now** there was no definitive proof. Now, evidence has been published that an opt-in program encompassing biometric testing and a personal wellness profile led to improved health and reduced healthcare costs."*

- Stephen C. Schimpff, MD

Former CEO, University of Maryland Medical Center
Author, "The Future of Healthcare Delivery: Why It Must Change and How It Will Affect You"

"Designing a wellness program that works is not simple — and poorly-designed wellness programs don't work. This carefully-constructed retrospective study of a successful wellness program in four Utah companies helps parse out what works and how strongly it works."

- Joe Flower

CEO, The Change Project, Inc.
Author, "Healthcare Beyond Reform: Doing it Right for Half the Cost"

International Journal of Workplace Health Management

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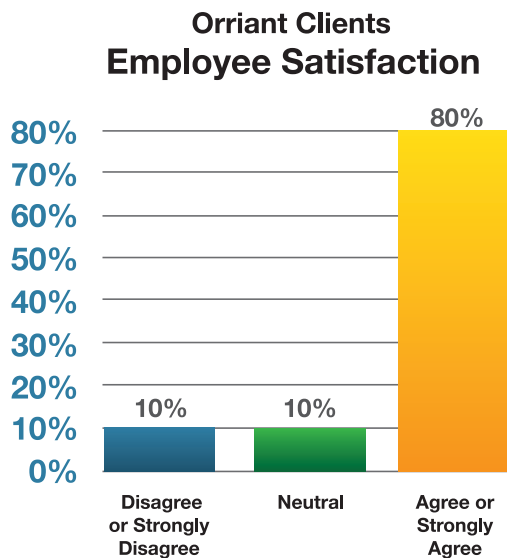
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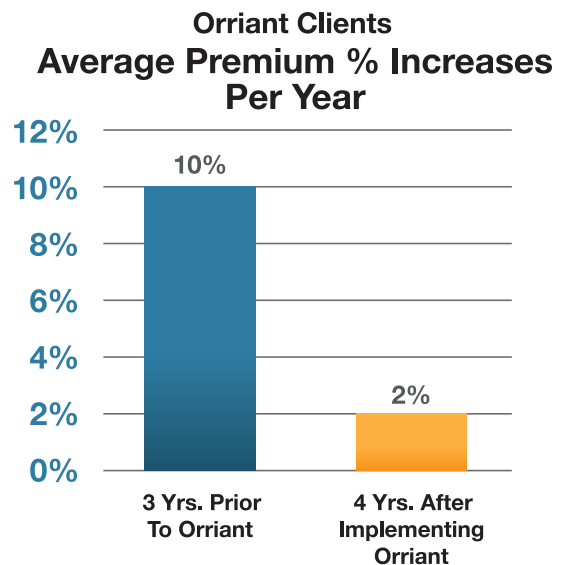
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Orriant is a national vendor of accountability-based wellness programs, with participants in every state and numerous corporate clients across the country. Orriant has been selected by multiple networks of brokers, throughout the United States, as their preferred wellness vendor.



"I appreciate that my employer offers this program."



Orriant's clients get real results that impact the bottom line.



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An evaluation of a comprehensive, incentivized worksite health promotion program with a health coaching component

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Abstract

Purpose – The use of lifestyle coaches in a worksite setting to improve weight, nutrition, physical activity, and smoking behavior among at risk individuals is a relatively new area of research in the field of health promotion. The purpose of this paper is to assess the effectiveness of an accountability-based worksite telephonic health coaching program that incorporates financial incentives, a personal wellness profile (PWP) assessment tool, and biometric testing.

Design/methodology/approach – A retrospective cohort study was conducted based on data from four midsize companies in Utah (USA), 2007-2010. Individuals with high-risk biometric scores were required to work with a health coach.

Findings – Participants had fewer healthcare claims and lower costs than nonparticipants, which became more pronounced over the study period. Health risks and PWP results significantly improved, more so in those in poorer health at baseline that worked with a health coach. Mean difference between health age and potential achievable age significantly decreased, more so for men than women and among those with the greatest need for improvement.

Originality/value – Health coaching effectively improved biometric scores among high-risk individuals and narrowed the difference between current health age and achievable age, more so among those with the greatest health risks at baseline who worked with a health coach.

Keywords Health promotion, Employee behaviour

Paper type Research paper

Introduction

In the USA, smoking, high-blood pressure, elevated blood glucose, and excessive body weight and obesity currently reduce life expectancy by an estimated 4.9 years in men and 4.1 years in women (Danaei *et al.*, 2010). Although progress has been made in lowering smoking prevalence in this country, preventable risk factors that negatively impact life expectancy like poor diet, physical inactivity, and excessive weight and obesity continue to show increasing trends (Centers for Disease Control and Prevention, 2012). Mental disorders are also common in the USA, with an estimated one in four Americans ages 18 and older suffering from a diagnosable mental disorder in a given year (Kessler *et al.*, 2005). In 2009, the mean number of mentally unhealthy days (which includes stress, depression, and problems with emotions) in the past 30 days among adults in the USA was 3.5 (95 percent CI = 3.4-3.6), which was



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significantly greater for females than males (4.0, 3.9-4.1 vs 2.9, 2.8-3.1) (Centers for Disease Control and Prevention, 2011a).

The negative impact of physical and mental health problems can be seen throughout society, including the workplace. Poor physical and mental health contributes to job turnover, presenteeism (diminished on-the-job performance and productivity), and absenteeism (Lerner *et al.*, 2004; Goetzel and Ozminkowski, 2008), with presenteeism posing the greatest cost to employers. In 2000, Bank One estimated that presenteeism was more expensive to companies than the combined effects of direct medical and pharmaceutical costs and indirect costs involving absenteeism, short-term disability, or long-term disability (Burton *et al.*, 2003; Hemp, 2004). The study estimated that presenteeism costs companies two to three times more than direct medical costs and 11 times more than absenteeism, as consistent with other studies (Kronos/Mercer, 2008; Stewart *et al.*, 2003).

Improving employee physical health and mental well-being are two important ways to lower presenteeism and missed work (Merrill *et al.*, 2012). A number of studies have shown that worksite wellness programs can effectively improve employee health and well-being (Brown *et al.*, 2011; Cancelliere *et al.*, 2011; Fahey *et al.*, 2008; Jensen, 2011; Merrill *et al.*, 2009, 2010, 2011a; Racette *et al.*, 2009; Tucker *et al.*, 2008; Van Wier *et al.*, 2009). These programs tend to be model and theory based (Green and Kreuter, 2004; Rosenstock *et al.*, 1988; Prochaska and Velicer, 1997; Trepper *et al.*, 2008). For example, an important aspect of the Precede-Proceed model is identifying factors that if modified will result in improved and continued behavior change, such as knowledge, beliefs, values, and attitudes (precipitating factors); skills and resources (enabling factors); and social support, peer support, etc. (reinforcing factors) (Green and Kreuter, 2004). The health intervention in the current study has incorporated each of these factors for motivating improved and continued behavior change, such as personal wellness and biometric screening assessment, health courses, workshops, incentives, and telephonic health coaching.

The purpose of this study was to assess the effectiveness of a worksite wellness program that incorporates a combination of a personal wellness profile (PWP) assessment, biometric screenings, health courses, workshops, incentives, accountability-based telephonic health coaching, and an on-line tracking portal. The program was administered by a wellness company designed to assist small to mid-size companies that lack the resources to independently develop and manage their own wellness program. By completing the PWP and biometric testing, individual health risk profiles were determined. Biometric scores above selected standards were used to refer high-risk individuals for telephonic health coaching. The health coach assisted the individual in setting goals and carrying out these goals to improve their health-related risk indicators.

Methods

Study population

A retrospective cohort study design was employed to evaluate the effectiveness of the health coaching wellness program. Analyses were based on data from participants in four midsize companies in Utah. These companies reflected sales, services, manufacturing, and government. The study population included full-time employees and their spouses aged 18 years and older during 2007 through 2010. Three companies were represented in the study all four years and one company during 2008 through 2010.

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The wellness program

The wellness program was designed as an opt-in program and was introduced to the employees at the annual open enrollment meetings for each company. A program description with details of all the program requirements were handed out to each person and sent to those not attending. The program was fully administered by Orriant, a third-party wellness vendor. Employee contributions toward monthly health insurance premiums were adjusted as a reward/penalty based on successful participation in the program. Those employees/spouses who chose not to participate in the program paid a higher contribution throughout the year. Those employees/spouses who opted to participate in the program would pay a lower contribution each month as long as they remained compliant with all the requirements of the program.

Compliance was reviewed quarterly and reports were sent to the company at the end of each quarter to let the company know which employees/spouses were compliant and should continue to pay the lower contribution during the upcoming quarter. If employees/spouses were reported as being noncompliant they would pay the higher contribution during the upcoming quarter as well as the rest of the plan year. They would be allowed to reenter the program the following plan year. Program requirements were as follows:

- (1) Complete a self-reported health risk appraisal called the PWP.
- (2) Participate in a biometric screening at the first of the year to determine if they meet certain health standards. For convenience, screening tests were offered at the worksite. However, screenings performed by their own doctor were also accepted.
 - Those who met each of the health standards were required to participate in at least one health promotion activity per quarter to maintain compliance. Those were all participatory type activities that all wellness program participants could engage in such as workshops/seminars, online learning activities, and health-related competitions.
 - Those who did not meet one or more of the health standards were required to have an ongoing relationship with a telephonic health coach. Their initial telephone meeting with the health coach would involve rapport building, review of their health-risks and health history and the development of life-style-related health goals unique to that person. **The coach did not prescribe a set of goals, but rather engaged the person in deciding for themselves what physical activity and nutritional goals they were willing and ready to start working on.** Their compliance in the program was then measured by their success at reaching those goals, tracking their progress on those goals on a regular basis and their calling the coach on a monthly basis. The goals were behavioral goals versus biometric goals.
- (3) As long as each participant was meeting their specific program requirements, they continued to pay the lower employee contribution. However, if they were not compliant, they would pay the larger contribution for the rest of the year. The employer never knew who had the health risks and who did not. Only aggregate information about the group as a whole was reported to the employer.

Health promotion communications were primarily targeted to participants of the program in the form of monthly newsletters, which were only sent to individuals who opted into the program at the beginning of the year.

Financial incentives

The worksite wellness program included financial incentives. Incentives were used to encourage participation in the worksite wellness program. Incentives in the first company were \$492 per year during 2007 through 2009 and \$600 for employees in 2010. Spouses received \$300 per year to participate, beginning in 2010. The incentives were distributed across the yearly pay periods. Incentives in the second company were \$360 per year in 2007 and 2008. This amount increased to \$528 in 2009 and \$720 in 2010. Beginning in 2010, if a spouse was also participating in the wellness program, the incentive was \$960 per year for the employee. The incentives were distributed across the yearly pay periods. Incentives in the third company involved \$500 per year for employees and \$250 per year for spouses. The incentive was distributed in each pay check in 2007 and 2008, and quarterly in 2009 and 2010. The fourth company did not offer the wellness program until 2009. This company always included spouses, with incentives of \$960 in 2009 and \$1,200 in 2010. The employee received half the incentive for participation and the spouse received the other half of the incentive for participation. Incentives were distributed across the yearly pay periods.

The second and third companies charged nonparticipants more for their insurance. This surcharge to the nonparticipants has been enough to cover the cost of the program. Because of this they have been willing to increase the incentive to increase participation.

Biometric testing

Health risks were monitored using biometric testing. Biometric data were obtained in each calendar year. Testing sites were set up at each company. Employees and their spouses scheduled their screening appointments through the Orriant online portal or by calling ahead of time. The results of their screening were provided to them at the screening and they would then meet with someone to review their results and schedule a telephonic appointment with a health coach if they did not meet the health standard. They would also review all the program requirements to ensure that each person participating understood what was expected of them to remain compliant.

Biometric testing resulted in measures of body mass index (BMI), blood pressure, cholesterol, glucose, and body fat. BMI (Kg/m^2) was based on measured height and weight, using the equation: $\text{BMI} = \text{mass (kg)} / (\text{height (m)})^2$ (US Department of Health and Human Services, 1998). Systolic blood pressure (mmHg) and diastolic blood pressure (mmHg) were determined manually by a stethoscope. Total cholesterol and high-density lipoprotein (HDL) were measured using a finger prick blood sample, which was processed by a Cholestech LDX. We report the cholesterol ratio (total cholesterol divided by HDL). Fasting glucose was measured using a finger prick blood sample processed by a Cholestech LDX. Percent body fat was determined using an Omeron portable body fat analyzer.

If participant scores did not reach certain standards with respect to the selected biometric measures, they were informed they had not met the standard. Standards were <5 cholesterol ratio, <110 mg/dL fasting glucose, <120 systolic blood pressure, <80 diastolic blood pressure, <30 BMI, <22 percent (men) and <28 percent (women) body fat. Individuals who did not meet one or more of these standards

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were required to contact a health coach in order to establish relevant nutrition and/or exercise goals.

Standards slightly above the ideal were selected in order to avoid potential conflict with participants who were just slightly above the norm and who might challenge the validity of the test procedures.

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PWP

The PWP is a validated health risk assessment tool reviewed and certified by the National Committee for Quality Assurance (Wellspring, 2012). It is widely used as a lifestyle health risk management-based tool for assessing items such as body composition, cancer risk, fitness, heart health, nutritional behavior, safety, and stress. It is an intervention-oriented tool aimed at motivating long-term behavior change within the framework of the Health Belief Model (Rosenstock *et al.*, 1988) and the Transtheoretical Model (Prochaska and Velicer, 1997). Summary scores are generated for each item, thereby providing baseline information for improving health-related behaviors. Two measures of age are obtained based on the participant's responses. The first is their health age, not their chronological age. The second is their potential achievable age, based on the person scoring perfectly on all the questions.

The health coach

The wellness program is unique for each individual, based on their readiness to change. Health coaching was implemented, based on motivational interviewing theory (Miller and Rose, 2009) and solution focussed therapy (Trepper *et al.*, 2008). Participants were required to contact a health coach if they did not meet one or more of the selected health standards. These individuals worked with a health coach on an ongoing basis. With the goal of lowering their health risks into the normal range, coaches were contacted by telephone. In a few exceptions, e-mail was used. The health coaches' role was to help participants set goals, track their goals, motivate, encourage and celebrate successes and personal development. After each person's goals were entered into the system, the results that they tracked and entered into the goal tracker were converted to simple percentages. The confidential portal provided them an up to date dashboard in the form of "red light-noncompliant," "yellow light-warning", and "green light-compliant" so they could always know if they were sufficiently meeting their program requirements in the program.

The health coaches dealt with a variety of health-related lifestyle issues such as: self-managing chronic conditions, navigating the healthcare system, starting an exercise program, smoking cessation, increasing energy, managing stress, sleeping better, managing pain, and losing weight. All of the coaches had at least a bachelor's degree in the health sciences and then trained in proven behavioral modification techniques.

It was the participant's responsibility to contact the health coach. Once the goals were set with the assistance of a health coach, they had to reach their required goals at an average of 50 percent or better for continued program participation. If their nutritional goal was to drink eight glasses of water every day, drinking four glasses per day would yield a compliance score of 50 percent. The percentage that goals were tracked within each quarter was also indicated on the web portal. For example, if they tracked their goals nine out of the 12 weeks in the quarter they would get a score of 75 percent which is the minimum required for continued participation in the program.

The health coach scored the engagement level of the employee at the end of each call on a 5 point scale; 1 = poor, 2 = fair, 3 = good, 4 = very good, and 5 = excellent. The question being scored was “How engaged is this person in the management of their health and wellness?” The score can vary from call to call based on the latest information gathered by the coach. The coach has no financial incentive to score the person high. The score is not a representation of how well the person likes the program or their coach, but rather the coach’s assessment of the person’s engagement in their own health and wellness.

Everyone was educated on the requirements of the program prior to opting into the program. If they did not like the requirement to contact a coach on a regular basis, they had the choice to not participate. Response to regular contact with a coach was very positive. For those in the current study that worked with a health coach, the percentage that agreed/strongly agreed that their coach was very helpful in educating them about ways to improve their health was 90 percent, that their coach impressed them as being knowledgeable and professional was 89 percent, that their coach impressed them as being caring and compassionate was 89 percent, that their coach took the time to get to know them and learn about their health history and concerns was 90 percent, and that their coach motivated them to improve their health was 80 percent.

Online tracking

An online password protected tracking portal is available to all participants, which includes biometric testing results, PWP summary information, health coach information, goal tracking, workshops, health courses, personal journaling, social networking, calendaring and the ability to set your own personal reminders. Program participation involving workshops, health courses, and social networking were built upon Social Cognitive Theory (Bandura, 2001). The online tracking system has the ability to track progress of participants on an individual basis as well as a company-aggregate basis. The site gave participants a real-time view of their compliance status in the program. After entering their data, feedback is provided immediately such as percentage of success and graphs to show trends over time. Data could be entered up to three weeks after the current date. Tracking their progress on a regular basis is a fundamental principal of behavioral change.

A small number of participants did not have access to a computer. These individuals completed a paper version of the PWP and a staff member entered their results. Their results were then mailed to them.

Healthcare claims

Claims data were available within each of the calendar years 2007 through 2010. A unique member number was associated with each claim, along with a place of service code, place of service description, and service date. Each claim amount reflected the payment made by the insurance company. It does not include the patient liability payment. Approximately 2 percent of the claims were later denied for payment. These payments were not included in the reported frequency and total amounts paid by the insurance companies. In addition, US medical cost inflation, annual average, was used to adjust all claim amounts to 2010 dollars (Halfhill, 2013).

Confidentiality

The database was de-identified according to Health Insurance Portability and Accountability Act guidelines and was exempt from the need for informed consent by

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the Institutional Review Board at the Brigham Young University. The current study was classified as a low-risk study by the Institutional Review Board.

Statistical techniques

Frequencies, means, and rates were used to summarize and describe the data. Biometric variables were classified according to risk group and mean scores at baseline and mean change scores at one, two, and three years of follow-up were compared, adjusted for age and sex. Note that one year of follow-up occurred for those who participated in two successive years (i.e. 2007 and 2008, 2008 and 2009, or 2009 and 2010); two years of follow-up occurred for those who participated in three successive years (i.e. 2007-2009 or 2008-2010); and three years of follow-up occurred for those who participated in four successive years (i.e. 2007-2010). PWP variables were similarly classified according to risk group and mean scores at baseline and mean change scores at one, two, and three years of follow-up were compared, adjusted for age and sex. A new variable was created, the difference between the person's health age and their potential achievable age if they scored perfectly on all the questions. The mean score for this variable was derived at baseline and mean change scores at one, two, and three years of follow-up. Mean change scores were assessed, adjusted for age and sex. Adjustment for age and sex in the different models was performed using multiple regression. Differences in proportions were evaluated for statistical significance using the χ^2 test and differences in means and mean change scores were evaluated for statistical significance using the *t*- and *F*-tests. Statistical significance and confidence intervals were based on the 0.05 level. Statistical analyses were derived from Statistical Analysis System (SAS) software, version 9.3 (SAS Institute Inc., Cary, NC, USA, 2010).

Results

The level of employee and spouse participation in the comprehensive, incentivized worksite health promotion program steadily increased over the study period (Table I). The participation rate increased in each company, with the exception of Company 3, where it began relatively high and remained more constant. Participation rates were slightly higher for men than women in the years 2007 through 2009. Participants had a significantly older age than nonparticipants in 2008-2010 (38.6 vs 38.2 in 2007, 40.1 vs 37.6 in 2008, in 40.6 vs 38.5 2009, and 40.8 vs 39.4 in 2010).

The frequency of healthcare claims per person started lower and increased at a lower rate among participants than nonparticipants (Figure 1). Number of claims among nonparticipants was 1.9 times greater in 2007 and 2.8 times greater in 2010. Medical costs among participants were lower and increased at a lower rate than among nonparticipants (Figure 2). In 2007, costs were 2.0 times greater in nonparticipants, and

Table I.
Participation rate among adults ages 18 years and older per year

Population	No.	%	Participants								
			Female (%)	Male (%)	χ^2 <i>p</i> -value	Comp. 1 (%)	Comp. 2 (%)	Comp. 3 (%)	Comp. 4 (%)	χ^2 <i>p</i> -value	
2007	3,781	1,814	48	46	50	0.024	42	42	57	–	<0.001
2008	5,469	2,777	51	49	53	0.003	49	47	61	46	<0.001
2009	4,599	2,739	60	57	62	<0.001	54	62	69	55	<0.001
2010	4,270	3,012	71	72	69	0.060	84	80	60	58	<0.001

in 2010, costs were to 2.9 times greater in nonparticipants. Note that individuals with claims exceeding 30,000 were not included in this healthcare claims and cost analysis.

Participants are presented according to baseline biometric classification in Table II. Mean change scores from baseline are also shown for one, two, and three years of follow-up by baseline biometric grouping. At baseline, the percentage of participants exceeding the biometric standard for BMI is 32.4, for systolic blood pressure is 57.5, for diastolic blood pressure is 55.8, for cholesterol ratio is 37.2, and glucose is 15. In addition, the majority of men and women exceeded the standard for body fat. Mean change scores through one, two, and three years of follow-up are significant, with the exception of three-year follow-up for cholesterol ratio. Significant decreasing scores occurred for those biometric classifications exceeding the standard, more so in higher classifications.

Participants are presented according to baseline PWP classifications in Table III. Mean change scores from baseline are also shown for one, two, and three years of follow-up by initial classification. Unlike the biometric scores where higher values pose greater health risks, higher PWP scores reflect better health or behaviors. Significant change scores occurred across the levels of each PWP item and over one, two, and three, years of follow-up. Those with lower baseline scores tended to show significant increases through one, two, and three years of follow-up, whereas those with higher baseline scores tended to show significance decreases through the years of follow-up.

Mean difference scores between the person's health age and the person's potential achievable age if they scored perfectly on all the questions was 5.0 (SD = 3.0). The change in the mean difference score after one year was -0.6 (SD = 2.5), two years was -0.8 (SD = 2.6), and three years was -1.0 (SD = 2.9). Each of these changes was significantly

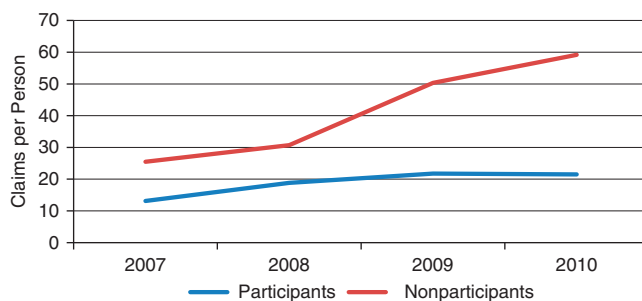


Figure 1.
Number of claims per person according to participation status and year

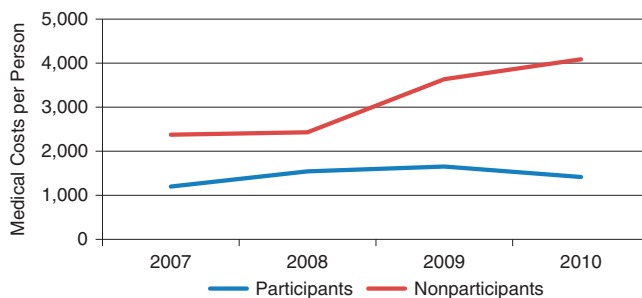


Figure 2.
Medical costs per person according to participation status and year

	Coaching required ^a	No.	Baseline %	Mean	Years of follow-up		
					1 Mean change	2 Mean change	3 Mean change
<i>BMI (Kg/m²)</i>		2,589			2,278	1,533	832
Underweight (<18.5)	No	34	1.3	17.6	<i>0.5</i>	<i>0.4</i>	<i>0.9</i>
Normal (18.5-24.9)	No	821	31.7	22.6	<i>0.2</i>	<i>0.1</i>	<i>0.4</i>
Overweight (25.0-29.9)	No	894	34.5	27.4	<i>-0.1</i>	<i>-0.3</i>	<i>-0.2</i>
Obese 1 (30.0-39.9)	Yes	718	27.7	33.6	<i>-0.6</i>	<i>-0.7</i>	<i>-0.3</i>
Obese 2 (≥40)	Yes	122	4.7	44.1	<i>-0.9</i>	<i>-1.6</i>	<i>-2.3</i>
<i>Systolic BP (mmHg)</i>		2,663			2,353	1,584	868
Normal (<120)	No	1,132	42.5	110.3	<i>4.1</i>	<i>5.6</i>	<i>3.4</i>
Pre hyperten. (120-139)	Yes	1,222	45.9	126.8	<i>-5.0</i>	<i>-3.8</i>	<i>-5.5</i>
High (140-159)	Yes	272	10.2	144.4	<i>-14.8</i>	<i>-14.0</i>	<i>-18.7</i>
Dangerous (≥160)	Yes	37	1.4	169.9	<i>-31.2</i>	<i>-32.5</i>	<i>-34.4</i>
<i>Diastolic BP (mmHg)</i>		2,662			2,353	1,582	869
Normal (<80)	No	1,178	44.2	71.8	<i>3.6</i>	<i>4.4</i>	<i>4.1</i>
Pre hyperten. (80-89)	Yes	1,112	41.8	82.3	<i>-2.4</i>	<i>-1.9</i>	<i>-2.3</i>
High (90-99)	Yes	291	10.9	92.1	<i>-8.2</i>	<i>-7.8</i>	<i>-9.9</i>
Dangerous (≥100)	Yes	81	3.1	105.3	<i>-17.8</i>	<i>-17.2</i>	<i>-17.7</i>
<i>Cholesterol ratio</i>		2,522			2,184	1,452	790
1-4.9	No	1,583	62.8	3.4	<i>0.2</i>	<i>0.4</i>	<i>0.4</i>
5-9.9	Yes	868	34.4	6.0	<i>-0.4</i>	<i>0.2</i>	<i>-0.1</i>
≥10	Yes	71	2.8	11.6	<i>-4.1</i>	<i>-3.6</i>	<i>1.3</i>
<i>Glucose (mg/dL)</i>		2,555			2,222	1,497	807
Normal (<110)	No	2,172	85.0	92.7	<i>3.3</i>	<i>0.3</i>	<i>1.5</i>
IFG (110-125)	Yes	256	10.0	114.8	<i>-7.4</i>	<i>-11.1</i>	<i>-8.6</i>
Diabetes (≥126)	Yes	127	5.0	164.4	<i>-29.9</i>	<i>-30.3</i>	<i>-31.3</i>
<i>Body fat % – men</i>		1,268			1,119	733	388
<22	No	514	40.5	16.3	<i>0.8</i>	<i>0.9</i>	<i>1.7</i>
≥22	Yes	754	59.5	27.9	<i>-1.2</i>	<i>-0.7</i>	<i>-0.7</i>
<i>Body fat % – women</i>		1,162			1,019	693	390
<28	No	320	27.5	22.9	<i>0.9</i>	<i>0.5</i>	<i>1.6</i>
≥28	Yes	842	72.5	37.0	<i>-1.2</i>	<i>-1.0</i>	<i>-1.9</i>

Table II. Health risk prevalence and change scores through one, two, and three years of follow-up according to baseline classifications

Notes: Means and mean change scores were adjusted for age and sex. Italicized values are statistically significant at the 0.05 level. ^aCoaching was required if one or more of the following standards was not met: <5 cholesterol ratio, <110 mg/dL fasting glucose, <120 systolic blood pressure, <80 systolic blood pressure, <30 BMI, <22 percent (men), and <28 percent (women) body fat

different than zero (*t*-test $p < 0.0001$). The change in mean difference score after one, two, or three years of follow-up did not significantly differ by age, but did significantly differ between men and women. Specifically, mean difference between health age and potential achievable age was 6.1 (SD = 3.2) for men and 3.8 (SD = 2.2) for women (*F*-test $p < 0.0001$). The change score after one year was -0.8 (SD = 2.9) for men and -0.4 (SD = 2.1) for women (*F*-test $p = 0.0003$) and after two years was -1.2 (SD = 3.0) for men and -0.4 (SD = 2.1) for women (*F*-test $p < 0.0001$). There was no significant difference in the change score between men and women at three years of follow-up.

The greater the difference between a person's health age and their potential achievable age at baseline, the greater room for improvement. Those with difference scores of 5 or more showed significant decreases in the difference scores over one, two,

PWP score	No.	Baseline %	Mean	Years of follow-up			Worksite health promotion program
				1 Mean change	2 Mean change	3 Mean change	
	2,083			1,824	982	146	83
<i>Body composition</i>							
<25	693	33.3	21.0	2.5	1.9	7.6	
25-49	731	35.1	37.6	3.1	3.4	9.2	
50-74	359	17.2	60.4	-2.0	0.6	-1.1	
≥75	300	14.4	86.0	-8.4	-8.4	-0.5	
<i>Cancer</i>							
<25	132	6.3	23.3	15.4	15.6	31.8	
25-49	1,091	52.4	48.9	8.1	9.2	15.9	
50-74	748	35.9	62.6	-1.4	-1.5	3.3	
≥75	112	5.4	83.0	-11.5	-13.5	-2.3	
<i>Fitness</i>							
<25	602	28.9	16.1	20.0	23.2	29.5	
25-49	629	30.2	37.5	7.3	7.3	7.5	
50-74	669	32.1	60.5	-3.5	-5.4	-4.3	
≥75	183	8.8	81.9	-10.5	-12.8	-20.5	
<i>Heart health</i>							
<25	577	27.7	12.3	23.5	24.9	35.3	
25-49	469	22.5	36.0	15.0	10.1	25.4	
50-74	820	39.4	67.8	-8.2	-12.8	-5.1	
≥75	217	10.4	86.9	-13.6	-19.8	-16.7	
<i>Nutrition</i>							
<25	659	31.6	20.1	18.2	19.9	26.2	
25-49	735	35.3	47.8	4.3	5.8	10.7	
50-74	287	13.8	62.5	-1.2	0.1	6.3	
≥75	402	19.3	79.7	-7.8	-9.7	-7.5	
<i>Safety</i>							
<25	76	3.7	24.2	42.9	43.0	42.4	
25-49	44	2.1	49.1	10.5	15.9	17.9	
50-74	274	13.1	70.6	6.4	10.5	13.2	
≥75	1,689	81.1	91.8	-0.9	0.5	0.4	
<i>Stress</i>							
<25	46	2.2	19.6	36.3	44.4	44.1	
25-49	173	8.3	46.7	16.2	16.8	20.7	
50-74	625	30.0	68.8	2.5	6.0	4.3	
≥75	1,239	59.5	85.4	-3.1	-0.8	0.1	

Notes: Means and mean change scores were adjusted for age and sex. Italicized values are statistically significant at the 0.05 level

Table III. Personal wellness profile prevalence and change scores through one, two, and three years of follow-up according to baseline classifications

and three years of follow-up (Table IV). Decreases were more pronounced in the ≥7.5 group compared with the 5-7.4 group. Those with difference scores at baseline of 0-2.4 showed significant increases in the difference scores over one, two, and three years of follow-up.

Discussion

This study assessed the effectiveness of a worksite wellness program that incorporates financial incentives, biometric testing, a PWP assessment, accountability-based telephonic health coaching, and an online portal for recording and tracking change.

Although we did not assess the influence of financial incentives on participation, financial incentives likely had a positive influence on program participation. Authors in other studies have suggested that financial incentives are the leading reason why a person participates in a worksite wellness program (Merrill *et al.*, 2011a; O'Donnell, 2010). For example, a survey of government employees who participated in a healthy lifestyle program indicated that they were most likely to agree that financial incentives motivated their involvement (80 percent), followed by a desire to improve health (73 percent), free health screenings (40 percent), feedback information on their health screenings (31 percent), health education provided by staff (14 percent), and nonfinancial incentives (11 percent) (Merrill *et al.*, 2011a).

Not all companies will be in a position to offer the level of financial incentives provided by the companies in the current study. Nevertheless, it may be financially beneficial for companies to invest in financial incentivized worksite health programs to lower costs associated with absenteeism, presenteeism, and healthcare costs (Goetzl *et al.*, 2004). A review of the literature published in 2001 found that reduction in absenteeism translated to a cost savings of \$15.60 for every dollar spent on worksite wellness programs (Aldana, 2001). Three more studies have each shown that health promotion program participation can significantly lower medical costs (Serxner *et al.*, 2003; Naydeck *et al.*, 2008; Merrill *et al.*, 2011a). In the most recent of these studies, which involved employees offered a similar level of financial incentives as in the current study, for every dollar spent on the intervention, there was a medical cost saving of \$3.85 (Merrill *et al.*, 2011a).

In 2007, individuals choosing to participate in the program were healthier than nonparticipants in terms of having fewer healthcare claims and costs. Other research has also shown that participants in worksite wellness programs tend to be healthier (Merrill *et al.*, 2011a). The healthcare claims and cost results only applied to those with medical costs less than \$30,000. Without this restriction, the greater number of claims and costs among nonparticipants than participants was even more pronounced (i.e. 2.9 vs 1.9 for claims and 3.4 vs 2.0 for costs). The greater number of healthcare claims and costs among nonparticipants became more pronounced over the study period. It may be that a larger proportion of healthy people migrated to the wellness program over the study period, explaining some of the increasing difference in number of claims filed and costs per person. However, the biometric and PWP analyses indicate that the program was effective at promoting continued good health behaviors and needed behavior change.

Table IV. Mean health age minus potential achievable age at baseline and mean change scores at one, two, and three years of follow-up according to baseline classification

Difference ^a	No.	Years of follow-up				
		Baseline %	Mean	1 Mean change	2 Mean change	3 Mean change
	2,083			1,824	982	146
0-2.4	381	18.3	1.1	<i>0.9</i>	<i>0.9</i>	<i>2.1</i>
2.5-4.9	512	24.6	3.1	0.1	0.0	-0.1
5.0-7.4	644	30.9	5.4	-0.7	-1.1	-1.5
≥7.5	546	26.2	8.9	-2.2	-2.5	-2.6

Notes: Means and mean change scores were adjusted for age and sex. Italicized values are statistically significant at the 0.05 level. ^aThe difference score reflects a person's health age minus their potential achievable age if they scored perfectly on all the questions

The results show significant improvements in the biometric measures for those exceeding selected levels at baseline. The fact that the change scores tend to be similar after one year of follow-up compared with two or three years of follow-up may indicate that the initial beneficial change is maintained but does not continue to improve. Further, although the large improvements in health indicators such as blood pressure, cholesterol ratio, and fasting glucose in the higher risk groups may have resulted from health coaching, some of the improvements are likely due to medication adopted after learning about their elevated biometric scores. Beneficial changes in BMI and body fat among high-risk individuals at baseline are more likely a direct effect of health coaching.

Participation in the accountability-based telephonic health coaching program was slightly greater for men and women. This is inconsistent with previous studies that showed that women have a greater tendency to participate in worksite wellness programs (Merrill *et al.*, 2011a, b; Polacsek *et al.*, 2006; Robroek *et al.*, 2009). In the USA, research has shown that women in general tend to be more health conscious in the sense that they are less likely to use illicit drugs, binge drink, or smoke cigarettes (US Department of Health and Human Services (US DHHS), 2009). They are also more likely than men to have health insurance and to have access to regular and consistent medical care and better nutrition (US DHHS, 2009; Centers for Disease Control and Prevention, 2011b). However, men may be more responsive to financial incentives, as suggested by the large incentives provided by the companies of this study.

Mean age was significantly greater among participants than nonparticipants. This is consistent with the need for greater health monitoring at older ages. In addition, older aged individuals are more likely to be classified in the high-risk categories of the biometric measures, such that they work with a health coach. The motivation and encouragement with a health coach likely contributes to continued participation. One study showed that attrition in a telephonic health coaching program was greatest among those least in need of behavior change (Merrill *et al.*, 2010).

In the current study, telephonic health coaching was required of those in the wellness program who exceeded recommended levels on their biometric tests. These were the participants that showed the greatest improvements across each of the biometric measures and PWP indicators. This is consistent with one health coaching program that found that those with the greatest need for behavior change had the greatest decrease in BMI (Merrill *et al.*, 2010).

A unique aspect of the accountability-based telephonic health coaching program is the number of individuals in contact with a coach. **In some situations, over 50 percent of all the insured adults associated with the companies were being held accountable to work with a coach on an ongoing basis until they no longer have the risks.** This is different from the more common model where health coaching takes place for a short amount of time, say one to three months. Over 30 percent of participants exceeded the biometric standard for BMI (i.e. 30 or greater), which is comparable to the average working population in the USA (Gallup Inc., 2011). This comparability and because of the diversity of the job sites considered in this study, the results may be generalized to a broad working population. Further, the high level of participation under this incentive, monitoring, and accountability-based health coaching model indicates the potential for high participation and success in other organizations.

The study is limited in that the PWP results were based on self-reporting, and consequently, may have been biased. However, results from the PWP were consistent

with the biometric scores, which were not susceptible to bias. Biometric and PWP change scores among high-risk participants receiving health coaching were compared with change scores for those not classified as high risk at baseline, who did not receive health coaching. Although biometric scores were compared with standards to determine whether health coaching was required, we did not have standards for the selected PWP items. We assume, however, that for the most part those who were classified as low risk on the PWP items would be those who satisfied the biometric standards. Finally, information on medication use was not available. Thus, we were unable to separate the effects of medication use, adopted when the participant learned they had elevated test scores, and health coaching.

Conclusion

Healthier people chose to participate in the wellness program. The program helped people maintain good health and make needed behavior change. Biometric testing and PWP assessment identified summary risk information and guidance for required health coaching. Significant improvements in the biometric measures occurred for those exceeding acceptable standards. Beneficial changes through one year of follow-up tended to be maintained through three years of follow-up. The difference narrowed between health age and potential achievable age.

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