

Worksite health promotion programs in college settings

Patricia E. Hill-Mey, Karol L. Kumpfer, Ray M. Merrill¹, Justine Reel, Beverly Hyatt-Neville², Glenn E. Richardson

Department of Health Promotion and Education, College of Health, University of Utah, ²Health Promotion Bureau, Salt Lake Valley Health Department, Salt Lake City, ¹Department of Health Science, College of Life Sciences, Brigham Young University, Provo, USA

ABSTRACT

The purpose of this paper is to describe the multifaceted nature and benefits of worksite health promotion programs (WHPPs), with emphasis on the college setting. An assessment of the peer-reviewed literature was conducted of articles published since 2000. Several search engines were accessed and selected key words were used. Most studies examining WHPPs have focused on return on investment and productivity. Research that targets the softer side-benefits of health promotion programs in the workplace is less available. Although the college setting offers some advantages for implementing health promotion programs. They may also have unique challenges due to their large and diverse employee population. There is little research to show the effectiveness and unique challenges of college-based health promotion programs.

Key words: Evaluation, health promotion, health risk appraisal, incentives, return-on-investment, university, worksite

INTRODUCTION

Fitness and recreation programs in the workplace date back to the early 1900s.^[1] These programs were primarily recreation-oriented, where facilities such as parks or swimming pools were made available to employees. Worksite health promotion programs (WHPPs) have since evolved to incorporate physical fitness and broader health promotion strategies such as health education, smoking cessation, weight loss, and stress management. Many of these programs have attempted to address escalating chronic disease and healthcare costs, and improve both employee productivity and retention.^[2-7] Flagship programs that targeted specific

health issues as well as disease prevention strategies surfaced in companies and organizations such as PepsiCo, Sentry Insurance, Xerox, Rockwell International, and NASA. In recent years, a number of studies have investigated and highlighted the benefits of WHPPs.^[8-15] Evidence of their effectiveness has led the United States Department of Health and Human Services to incorporate WHPPs in its healthy people initiatives.^[16,17]

Worksite health promotion involves an organized, employer-sponsored program that supports employees (and sometimes their families) as they adopt and sustain behaviors that lower health risks, improve physical and mental quality of life, and enhance worker productivity.^[18] WHPPs tend to take a comprehensive approach by incorporating health risk assessment, health education, online interventions, health screenings, health coaching, and worksite activities. Successful programs require management and senior leadership support, dedicated staffing and resources, a culture of health, incentives and rewards, and a program evaluation strategy.^[19]

Little research has focused on examining the presence and effectiveness of WHPPs in college settings. The purpose of this paper is to identify current research involving WHPPs in college settings. We will also review elements of successful

Address for correspondence: Dr. Patricia E. Hill-Mey, 1901 E. South Campus Drive, #2120, Salt Lake City, UT 84112, USA. E-mail: dhm@sprynet.com

Access this article online	
Quick Response Code:	Website: www.jehp.net
	DOI: 10.4103/2277-9531.154019

Copyright: © 2015 Hill-Mey PE. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

This article may be cited as: Hill-Mey PE, Kumpfer KL, Merrill RM, Reel J, Hyatt-Neville B, Richardson GE. Worksite health promotion programs in college settings. *J Edu Health Promot* 2015;4:12.

WHPPs that may be considered when developing health promotion programs for college employees.

METHODS

The review was conducted in 2009–2011 and involved searching digital dissertations, ERIC, Scopus, HAPI, CINAHL, PubMed, Cochrane Database, Academic Search Premier, Web of Science, and Google Scholar. It focused on peer-reviewed journal publications published since 2000. Keywords used in the search included: Motivations and barriers, university or college-based WHPPs, health risk appraisal (HRA's), incentive-based and benefits integrated incentives used in WHPPs, return on investment (ROI) for WHPPs, key component or elements of success for effective WHPPs, productivity, absenteeism and presenteeism in business with WHPPs, health behaviors, and healthcare costs.

WORKSITE HEALTH PROMOTION PROGRAMS IN COLLEGE SETTINGS

College campuses are more akin to small communities with employees ranging from service workers to senior level faculty and administrators. A literature review involving 18 programs identified best practices for university-based health and wellness programs.^[20] The programs represented a variety of structured and non-structured programs. Structured programs were shown to have the greatest impact in improving overall employee health. Only 6 of the 18 programs involved formal evaluations, but they provided evidence the WHPPs could significantly decrease weight, body mass index, hypertension, and blood cholesterol in a college setting.^[20]

In a study that surveyed 59 community college campuses, of which 48 responded, 13 (27%) reported having some sort of structured wellness program for their employees.^[21] These schools were made up predominantly of urban institutions that had larger employee populations. The authors concluded that the main components of a successful WHPP in a college setting were a supportive environment, onsite physical activity resources, healthy food options, and a committee or staff dedicated to the success of the program.^[21]

Like any organization, the college setting is an ideal place for health promotion programs because (1) people spend a lot of time on the job; (2) an established vehicle of communication already exists, wherein messages can be promoted, education can be provided, and skills (e.g., how to eat healthier foods or how to better manage stress) can be taught; (3) employees can receive social support from co-workers and managers; (4) the capability of instituting policies (e.g., “no smoking”) that can foster behavior change and a healthy work environment; and (5) leverage incentive can motivate program participation and increase the impact of healthy behaviors on the bottom line.^[19,22] In addition, many colleges already have existing fitness and health facilities.^[21]

Until date, there have been few published data-based articles or evaluations to explain why participants enroll and attend college health promotion programs, and what perceived barriers and motivators may influence participation.^[23-25] Although few of the programs reported on incentives used to motivate or stimulate participation,^[23] it is likely that the incentives that work best in the workplace would work best in the college setting.

ELEMENTS OF A SUCCESSFUL WORKSITE HEALTH PROMOTION PROGRAM

Several studies have explored the best practices of WHPPs and how managers can successfully implement these programs.^[15,18,26-28] Organizations such as Wellness Councils of America (WELCOA), The Health Enhancement Research Organization, and the Centers for Disease Control and Prevention (CDC) have established guidelines and criteria to assist businesses in conceptualizing, planning, and implementing WHPPs.^[28-30] Organizations such as the National Institutes of Health and the partnership for prevention have also contributed to the body of knowledge that assists business and industry in developing tailored WHPPs for their companies.^[16,22] Together these efforts have provided a template for successful WHPPs.

To be effective in fulfilling the evolving needs of college faculty, staff, and administrators WHPPs should strive to meet and follow certain core criteria. The overlapping themes and goals for creating a successful WHPP are synthesized in the list below. These themes stem from the guidelines, pillars of success, benchmarks, and components of successful programs that have produced the greatest returns on investment.^[18,26-28]

- Establish a business case for the program specific to the school
- Have a comprehensive plan that addresses the business case
- Have management support at all levels.
- Assess the needs of the population and provide quality, relevant programs that address those needs.
- Establish, align, and integrate the WHPP into the campus culture.
- Use a variety of methods to communicate effectively with faculty, staff, and administrators.
- Be accessible and make the WHPP convenient.
- Individualize programs and services as much as possible.
- Create partnerships within the school and community.
- Measure and evaluate the WHPP's effectiveness regularly.

Related to these core components are selected questions that should be considered when planning a WHPP.

- Is there a business case established for the WHPP?
- Are the needs of the employees understood and being met?

- How was this determined, through needs assessment or HRA?
- Have expected outcomes been identified, such as measurable healthcare cost reduction, health behavior change, increased productivity, decreased absenteeism, or reduction in employee turnover?

The remainder of this section will discuss in more detail each of the 10 core components of an effective WHPP with attention given to the unique challenges and opportunities colleges present.

Business case

The business case is referred to as an economic analysis or a “scenario in which an organization realizes a positive ROI for a particular intervention or program.”^[26] A business case is driven by the needs assessment and desired changes that senior management wishes to see as a result of the program.^[1] Elements of a successful business case result from the development of a program that fits within the needs of that organization, as well as its present issues and concerns.

Management support

In the classic WHPP model, management support at all levels is optimal and includes participation and support from the top levels of management through middle management to the employee level.^[15,17,18] The college setting is unique in that it combines many disciplines and many types of professionals. It includes maintenance staffs, administrators, and faculty all grouped into unique departments. It is important to recognize these differences while applying the classic model. Management support at all levels would be most effective if maintained by department.

Needs assessment

Worksite health promotion programs are incomplete without a thorough assessment of the needs of the population to be served. Program planning, driven by the identified needs, should determine the types of classes, educational programs, communication and messages, activities and interventions provided by the program. In essence, the needs assessment creates a framework for the program plan. Needs assessment can also help determine the highest impact incentives. Although the use of extrinsically motivating incentives is controversial, they have been shown to sharply increase participation at the outset of a program.^[27] Colleges must avoid appearing manipulative in the use of incentives.^[28]

Supportive corporate culture

The state-of-the-art health promotion program must expand beyond the walls of a fitness center and permeate the entire culture of the organization. Program managers should understand what drives the campus culture and consciously integrate and align the program plan with this culture. A healthy workplace culture also includes having campus policies and a supportive environment that allow for and reinforce participation in the health promotion program. In addition to the physical environment, a psychologically

supportive environment is needed (or should be created) that allows employees to express opinions, ideas and give and receive feedback in a nonjudgmental manner, as well as feel comfortable, safe and supported at work.^[1,18] Effective alignment must also take into account how programs are planned and implemented, keeping in mind the health literacy of employees, their cultural receptivity, and the need for privacy and confidentiality.

Campuses with health and fitness-related academic degree programs may benefit from the inclusion of this staff and their expertise in motivating and supporting other participants across the school.

Provide quality, relevant programs

In order to expand offerings beyond traditional choices, proven, evidenced-based programs should be adopted, as well as a high level of quality assurance, by seeking out accredited health and wellness vendors, and generating program outcome reports on a regular basis.^[26,29] These efforts help support the business case and demonstrate to employers that programs are producing measurable and valuable results.^[31] In addition, program managers and planners should monitor and evaluate their programs regularly, especially those provided by outside service providers.^[18] Fun and enjoyment can play an important role in program participation and adherence; employees (and people in general) respond more positively to a program that is fun and includes a degree of intrinsic motivation.^[18]

Create partnerships within the campus and community

Programs that integrate with related human resource functions to include employee assistance programs, workers compensation and occupational health programs, and benefits administration can have value, especially in facilitating work-life balance and addressing other personal concerns that can affect employee health and well-being.^[32] Integrating WHPPs with the campus culture should include the alignment of like-minded services within the campus setting to provide programs that promote healthy outcomes in the workplace. These integrated approaches can also include updates to cafeterias so that they provide healthy food options or the utilization of in-house medical departments to provide WHPP services.

Effective communications

Messages can be tailored for specific activities, with well-being issues targeted for specific audiences or distributed en masse to the employee population to promote the WHPP. Driven by the department chairs, deans, and other administrators, these messages can be delivered through electronic newsletters, flyers, postcards, mobile health, smart phones with free apps, and inexpensive promotional materials such as desk top reminders, mugs or T-shirts. Whatever shape these strategies take, communication must be accurate, informative, ongoing and supportive of participants in order to be successful in promoting behavior change.^[18,33]

Tailoring and customizing the communications to the end user can be more easily achieved today with the use of social media and networks.^[34] These tools can also play an integral role in communicating health messages, as well as being an effective trigger toward successful behavior change.^[34,35] For example, one study reported that participants who received tailored feedback demonstrated significant improvement in compliance and behavior change.^[36] The combination of an HRA followed by tailored messages to help individuals better understand their health status and then coach them to develop strategies for achieving change has been shown to be an effective practice in WHPPs.^[36,37] This is especially important in a college setting given the diversity of the different departments and staff members. Tailored messages ensure that the program is being communicated effectively to these diverse groups of people.^[37]

Accessibility and convenience

The accessibility and convenience of WHPPs matter to employees.^[15,18,27] Onsite facilities are ideal, and colleges have a unique advantage in that most already have such facilities. Health screenings, classes, and noontime lectures can take place in conference rooms. Walking programs can be offered outside or in stairwells, and office stretch programs can be offered at the workstation. Some WHPP managers may coordinate with existing fitness facilities to offer specified times or classes to staff and faculty members.

Individualize programs and services

Programs should focus on individual participants, since one program will not meet everyone's needs. HRAs, which identify individual health risks, can provide a great opportunity to address individual concerns by using tailored health behavior change messages to the individual.^[36,37] This specific feedback can be followed by offering individualized health coaching, as needed or requested by the employee.^[38] Successful programs employ the common notions of identifying and supporting readiness to change by providing training and skills to develop self-efficacy, reinforcing positive behaviors through improving the worksite social and cultural environment, and encouraging intrinsic motivation.^[15,18,26]

Measure and evaluate regularly

To be considered successful, a WHPP must be based on more than do-good efforts. A company's commitment to help mitigate the health risks of their employees and lower healthcare costs of their company should be measured. It is important to show that the program is meeting the needs of the employee population as well as demonstrating a ROI and support for the business case.^[18,19,26]

The quality of the WHPP evaluation has improved in recent years to include more randomized control trials, longitudinal perspectives, and retrospective studies.^[39]

INCENTIVES

Incentivizing participation is a primary tool to achieve enrollment and involvement. It is estimated that well over

70% of WHPPs use some sort of incentive system to increase employee enrollment and participation, a recommended component of successful WHPPs.^[40,41] Incentives can take many shapes (e.g., financial incentives, paid time off work, and material rewards), but most researchers believe that financial incentives are the most effective.^[40,42] Accessibility of facilities, ability to include family members, a supportive work environment, and encouragement from management and co-workers are also considered incentives to participation that remove several of the barriers that typically get in the way of participation.^[41]

Benefits-integrated incentives account for approximately 48% of the incentives offered in WHPPs.^[31] Incentives is shown to be positively associated with program enrollment and completion of HRAs.^[33] Benefits-integrated incentives tend to allow the employer to offer a greater cash value at a lower cost to the organization, and usually involves monthly or annual premium reductions, a richer health plan, or payments into a health savings or flexible spending account.^[40] Companies that provide this type of incentive program can offer a much higher value, on average \$131 higher than companies that do not offer this option.^[33,40] When this strategy is employed, cost balancing within the overall benefits strategy by offsetting the incentive cost with employee contributions, can enable the employer to offer generous incentives with little impact to the employer's health budget. And, though calculated participation rates of 65% at an incentive level of \$200 may initially seem prohibitive, these amounts can be gradually added to the premium rates being charged to employees. This increase in premiums, with the subsequent reduction in premiums for participation, creates additional motivation for employees to participate. Employers typically work with their third-party providers to set premium contributions each year, so increases in these contributions are often expected by the employees.^[40] Structuring incentives in this way could be applied in a cooperate as well as a campus setting.

HEALTH RISK APPRAISALS IN WORKSITE HEALTH PROMOTION

HRAs provide a basis wherein wellness programs can be designed and delivered in a more targeted and effective way.^[43] HRAs help individuals become aware of health behaviors that can result in poor health and job performance.^[32] Most HRA vendors have the capacity to provide aggregate pre- and post-data that could help in evaluating the effectiveness of interventions offered at the worksite. In 2007, the CDC Community Guide to Preventive Services branch of the National Center for Health Marketing conducted a thorough review of the literature identifying how to best use HRAs in the workplace.^[29] Findings support prior literature indicating that HRAs, used in conjunction with a comprehensive health promotion and education program, yield the best results.^[29]

RETURN ON INVESTMENT

Most organizations are interested in the financial benefits gained by offering WHPPs.^[18,26,32] ROI figures are often

measured in terms of reduced absenteeism, increased productivity, decreased healthcare expenditures, and decreased workers' compensation claims and disability. WELCOA has written a report that identifies how the unhealthy lifestyles of employees, combined with increasing healthcare costs, have impacted the bottom line of most American businesses.^[5] Most data have shown ROI savings in healthcare costs because of WHPPs, ranging from \$1.40 to \$3.14/dollar spent, with a mean of around \$3.00.^[18,44] One paper reviewed 32 studies in 2001, showing an ROI of \$3.48.^[45] In a meta-analysis of 56 studies on the economic impact of WHPPs, 28 focused on healthcare costs, making it the most prevalent concern for businesses and the most common rationale for providing WHPPs.^[46] Looking at frequency and cost of prescription drugs and medical claims, another study found, after 5 years, a cost savings of \$3.85 for every dollar spent on the program.^[12]

A decrease in sick leave is the second-most prevalent economic variable and concern to employers when measuring the value of WHPPs.^[46] In a study that reviewed 14 articles that assessed WHPPs, a reduction in employee absenteeism was found in each article.^[45] A meta-analysis of 62 studies found that WHPPs represent very effective approach for reducing medical costs and absenteeism.^[47]

Studies involving WHPP ROI assessment should be sure to minimize any bias; use projected, not actual savings; accurately measure productivity savings; include significant factors; assess representative study groups; and include all expenses.^[48]

WHPP ROI assessment in college settings is lacking.^[20] However, because campuses largely function as multi-faceted companies and have the added benefits of onsite health and exercise facilities, the ROI could reasonably be expected to follow similar patterns to cooperate counterparts. The newer prevention technologies and other best practices that have increased the ROI for many companies can be applied in a college setting in the same way as long as attention to the diverse nature of campus employees is taken into consideration.

PRODUCTIVITY

Employee engagement, health behavior, and physical health each contribute to lower absenteeism and higher job productivity.^[49] Employee engagement has also been shown to be a function of physical and mental health. Improved company morale, employee retention, and loyalty have also been identified as rationales for employee health, fitness and well-being efforts in the workplace.^[15] Because better health translates into better sleep habits and improved energy levels, WHPPs can have a measurable impact on employee productivity. A study looking at work-life benefits and the impact on organizational behaviors found that providing work-life benefits into employee wellness programs sends the message of caring for the employee's well-being, which

translates into improved work performance and greater commitment to the employer.^[42] The caveat with this study, however, is the employee must value the benefits provided as relevant to their needs, hence reinforcing the importance of needs assessment. Studies looking at absenteeism and job satisfaction found a moderate association between participation in the company's WHPP and higher levels of job satisfaction, further supporting the value of offering these programs.^[40]

A direct dose-response association has been shown between physical and mental health and job productivity, with each health risk equating to \$950/year.^[43] Another study found that after implementing an ROI-based obesity management intervention, which included coaching, print materials and web-based tracking, seven out of ten health risks decreased.^[50] The total projected savings realized from this program (\$311,755) were attributable to reduced healthcare expenditures (59%) and increased productivity (41%). Another study assessed the influence of health risks on absenteeism and found significant relationships between 8 out of 10 of the health risks reviewed.^[51] These risk factors included exercise, back care, diet, driving safety, mental health, smoking/tobacco use, stress, and weight. The most significant risk factors identified were stress, mental illness, and back issues. A positive change in any of these three risk factors significantly reduced absenteeism. Finally, research has shown that WHPPs are also effective at helping low risk employees maintain their healthy behaviors.^[52]

For some employers, improving productivity is the primary purpose of their WHPP. One study demonstrated that lost productivity can have as much as a 2.3 times greater impact on the bottom line than medical and pharmacy costs.^[53] There is evidence that worksite health promotion interventions aimed at improving nutrition and physical and mental health may contribute to reducing presenteeism.^[54] A study conducted with the U.S. work force for the Dow chemical company found that almost 65% of respondents had one or more chronic health condition (e.g., allergies, arthritis/joint pain or stiffness, and back or neck disorders). Resulting absenteeism ranged from 0.9 to 5.9 hours during a 4-week period, and on-the-job work impairments ranged from 17.8% to 36.4%.^[55] Total cost of chronic conditions for Dow in the United States was estimated to be 10.7% (6.8% due to work impairment) of the total labor cost.^[55]

While research on this topic specific to colleges has not been done, it follows that an increase in productivity would follow a pattern similar to those seen at other large multi-faceted companies.

CONCLUSION

Although colleges are ideal settings for providing health promotion to employees, there are few research studies available that document the merits of these programs. Nevertheless, colleges may provide an even better setting

for health promotion programs than many businesses if they already have fitness and health facilities in place. They may also have greater resources than many organizations. However, there may be unique challenges for health promotion programs in a large, diverse college setting, which deserves further study.

College-based WHPPs can be a vehicle by which health education and health-related behavior skills can be taught. Time, culture, peer support, management support, and the ability to provide materials, motivation, and skills training can make an important impact on the health of employees and bottom line of an employer.^[16,27-29] Research supports the efficacy of WHPPs in terms of both direct costs (health care and works compensation) and indirect costs (absenteeism, presenteeism, and retention). Data focused on healthcare costs, claims and absenteeism are most prevalent, and research that targets the softer side benefits of health promotion programs are less available. More research is necessary to assess this important outcome of WHPPs.

REFERENCES

- Chenoweth D. Worksite Health Promotion. Champaign, Illinois: Human Kinetics; 2007.
- Kenealy B. Healthcare costs explode. Employee benefits news, 2011. Available from: <http://www.ebn.benefitnews.com/news/health-care-costs-explode-2713354-1.html>.
- Lorraine M, Chris G, Scott W. Milliman medical index. Milliman, 2011. Available from: <http://www.milliman.com/insight/Periodicals/mmi/2011-Milliman-Medical-Index/> [Last accessed on 2015 Feb 15].
- Kaiser Family Foundation. Employer Health Benefits 2011 Summary of Findings. Menlo Park: Kaiser Family Foundation and Health Research and Education Trust; 2012. p. 8225.
- Hunnicut D, Jahn M. Making the case for workplace wellness programs. WELCOA, 2011. Available from: <http://www.welcoa.org/freeresources/index.php?category=8> [Last accessed on 2012 Feb 15].
- McMahon T. Current employment data. Unemploymentdata.com, 2012. Available from: <http://www.unemploymentdata.com/charts/current-employment-data/> [Last accessed on 2015 Feb 15].
- Centers for Disease Control and Prevention. Chronic disease and health promotion (2010). Available from: <http://www.cdc.gov/chronicdisease/overview/index.htm> [Last accessed on 2015 Feb 15].
- Aldana SG, Merrill RM, Price K, Hardy A, Hager R. Financial impact of a comprehensive multisite workplace health promotion program. *Prev Med* 2005;40:131-7
- Serxner S, Gold D, Anderson D, Williams D. The impact of a worksite health promotion program on short-term disability usage. *J Occup Environ Med* 2001;43:25-9
- Schultz AB, Lu C, Barnett TE, Yen LT, McDonald T, Hirschland D, et al. Influence of participation in a worksite health-promotion program on disability days. *J Occup Environ Med* 2002;44:776-80.
- Serxner SA, Gold DB, Grossmeier JJ, Anderson DR. The relationship between health promotion program participation and medical costs: A dose response. *J Occup Environ Med* 2003;45:1196-200.
- Aldana SG, Jacobson BH, Harris CJ, Kelley PL, Stone WJ. Influence of a mobile worksite health promotion program on health care costs. *Am J Prev Med* 1993;9:378-83.
- Merrill RM, Hyatt B, Aldana SG, Kinnersley D. Lowering employee health care costs through the Healthy Lifestyle Incentive Program. *J Public Health Manag Pract* 2011;17:225-32.
- Merrill RM, Anderson A, Thygeson SM. Effectiveness of a worksite wellness program on health behaviors and personal health. *J Occup Environ Med* 2011;53:1008-12.
- Merrill RM, Aldana SG, Ellrodt G, Orsi R, Grelle-Laramée J. Efficacy of the Berkshire Health System Cardiovascular Health Risk Reduction Program. *J Occup Environ Med* 2009;51:1024-31.
- National Prevention Council. National Prevention Strategy, Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General, 2011.
- U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion. Healthy people 2020. Available from: <http://www.healthypeople.gov/2020/> [Last accessed on 2015 Feb 15].
- Berry LL, Mirabito AM, Baun WB. What's the hard return on employee wellness programs? *Harv Bus Rev* 2010;88:104-12, 142.
- Goetzel RZ, Ozminkowski RJ. The health and cost benefits of worksite health promotion programs. *Ann Rev Public Health* 2008;29:303-23.
- Montgomery SL. Building wellness through the implementation of exercise, nutrition and chronic health education. College of Nursing, University of South Carolina. PhD Dissertation, 2008. Ann Arbor, MI: Pro Quest Dissertations and Theses; 2008.
- Linnan L, Brooks A, Haws S, Benedict S, Birken B, French E, et al. Community colleges as settings for promoting employee health. *Am J Health Stud* 2010;25:86-91.
- American Time Use Survey. Bureau of Labor Statistics, 2011. Available from: <http://www.bls.gov/tus/charts/> [Last accessed on 2015 Feb 15].
- Ball T. Selected barriers and incentives for participation in a university wellness program. Thesis. Logan, Utah: Utah State University; 2009. Unpublished.
- Barker JW, Glass JC Jr. Perceived wellness needs of university employees. *J Am Coll Health* 1990;38:187-9.
- Eckhart GA, Ebro LL, Claypool PL. Needs, interests, and attitudes of university faculty for a wellness program. *J Am Diet Assoc* 1988;88:916-20.
- Pronk N. Six trends affecting the business case for worksite health promotion. *Worksite Health Promot* 2010;14:41-3.
- Holbrooke K. 5 Best practices for employee health and wellness programs. *ACSM's Health Fit J* 2010;15:38-40.
- Hunnicut D, Lefelman B. Welcoa's 7 Benchmarks of Success. WELCOA, 2006. Available from: http://www.welcoa.org/www/pdf/aa_6.1_novdec06.pdf.
- CDC Healthier Workplaces Initiatives. CDC, 2010. Available from: <http://www.cdc.gov/nccdphp/dnpao/hwi/programdesign/index.htm>.
- HERO Best Practice Scorecard. Health Enhancement Research Organization, 2009. Available from: http://www.the-hero.org/scorecard_folder/scorecard.htm [Last accessed on 2013 Feb 15].
- Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol* 2000;55:68-78.
- Baun W, Mirabito A, Berry L. Elevating the Discussion-The Value of Worksite Health Promotion. *Worksite Health International: International Association of Worksite Health Promotion*; 2010.
- Seaverson EL, Grossmeier J, Miller TM, Anderson DR. The role of incentive design, incentive value, communications strategy, and worksite culture on health risk assessment participation. *Am J Health Promot* 2009;23:343-52.
- Dennison L, Morrison L, Conway G, Yardley L. Opportunities and challenges for smartphone applications in supporting health behavior change: Qualitative study. *J Med Internet Res* 2013;15:e86.
- Fogg BJ. A behavior model for persuasive design. captology. stanford.edu, 2009. Available from: http://www.bjfogg.com/fbm_files/page4_1.pdf [Last accessed on 2015 Feb 15].
- Cowdery J, Konkel J, Wildenhaus K. The emerging use of tailoring in health promotion. *Am J Health Promot* 2002;6:1-7.
- Faghri PD, Blozie E, Gustavesen S, Kotejshyer R. The role of tailored consultation following health-risk appraisals in employees' health behavior. *J Occup Environ Med* 2008;50:1378-85.
- Business in Health. Partnership for Prevention, 2012. Available from: <http://www.prevent.org/Topics.aspx?eaID=1&topicID=52> [Last accessed on 2015 Feb 15].

39. Della LJ, DeJoy DM, Mitchell SG, Goetzel RZ, Roemer EC, Wilson MG. Management support of workplace health promotion: Field test of the leading by example tool. *Am J Health Promot* 2010;25:138-46.
40. Anderson DR, Grossmeier J, Seaverson, EL, Snyder D. The role of financial incentives in driving employee engagement in health management. *ACSMs Health Fit J* 2008;12:18-22.
41. Kruger J, Yore MM, Bauer DR, Kohl HW. Selected barriers and incentives for worksite health promotion services and policies. *Am J Health Promot* 2007;21:439-47.
42. Neville BH, Merrill RM, Kumpfer KL. Longitudinal outcomes of a comprehensive, incentivized worksite wellness program. *Eval Health Prof* 2011;34:103-23.
43. Burton WN, Chen CY, Conti DJ, Schultz AB, Edington DW. The association between health risk change and presenteeism change. *J Occup Environ Med* 2006;48:252-63.
44. Mitchell S, Goetzel R, Ozminkowski R. The value of worksite health promotion. *ACSMs Health Fit J* 2006;12:23-7.
45. Aldana SG. Financial impact of health promotion programs: A comprehensive review of the literature. *Am J Health Promot* 2001;15:296-320.
46. Chapman LS, Lesch N, Baun MP. The role of health and wellness coaching in worksite health promotion. *Am J Health Promot* 2007;21:Suppl 1-10, iii.
47. Chapman LS. Meta-evaluation of worksite health promotion economic return studies:2012 update. *Am J Health Promot* 2012;26:TAHP1-TAHP12.
48. Spero J. Return on investment models for employee wellness programs. *Corporate Wellness Magazine*, 2011. Available from: <http://www.corporatewellnessmagazine.com/article/return-on-investment-models.html> [Last accessed on 2015 Feb 15].
49. Merrill RM, Aldana SG, Pope JE, Anderson DR, Coberley CR, Grossmeier JJ, *et al.* Self-rated job performance and absenteeism according to employee engagement, health behaviors, and physical health. *J Occup Environ Med* 2013;55:10-8.
50. Baker KM, Goetzel RZ, Pei X, Weiss AJ, Bowen J, Tabrizi MJ, *et al.* Using a return-on-investment estimation model to evaluate outcomes from an obesity management worksite health promotion program. *J Occup Environ Med* 2008;50:981-90.
51. Serxner SA, Gold DB, Bultman KK. The impact of behavioral health risks on worker absenteeism. *J Occup Environ Med* 2001;43:347-54.
52. Edington DW, Yen LT, Witting P. The financial impact of changes in personal health practices. *J Occup Environ Med* 1997;39:1037-46.
53. Loeppke R, Taitel M, Haufle V, Parry T, Kessler RC, Jinnett K. Health and productivity as a business strategy: A multiemployer study. *J Occup Environ Med* 2009;51:411-28.
54. Merrill RM, Aldana SG, Pope JE, Anderson DR, Coberley CR, Whitmer RW, *et al.* Presenteeism according to healthy behaviors, physical health, and work environment. *Popul Health Manag* 2012;15:293-301.
55. Collins JJ, Baase CM, Sharda CE, Ozminkowski RJ, Nicholson S, Billotti GM, *et al.* The assessment of chronic health conditions on work performance, absence, and total economic impact for employers. *J Occup Environ Med* 2005;47:547-57.

Source of Support: This investigation was supported by the University of Utah Study Design and Biostatistics Center and from the Public Health Services research grant numbers UL1-RR025764 and C06-RR11234 from the National Center for Research Resources.
Conflict of Interest: None declared