

COMPLETING A WORKSITE HEALTH RISK ASSESSMENT CORRELATES WITH CONTINUING EMPLOYMENT, LOWER HEALTH CARE COSTS AND UTILIZATION

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Abstract

Objectives: Companies that understand the collective health risks of their employees, as well as worker productivity as it relates to health risks can provide more effective and necessary interventions. Health Risk Assessments (HRAs) are an important source of information for understanding overall health risks of a company's employees. However, HRA data tend to represent only a subset of employees, thereby providing employers an incomplete picture of employee health risks. The current study identifies the representativeness of those completing a worksite HRA by selected demographics, health care costs, and health risks in a large US company. **Material and Methods:** A retrospective analysis of employees in a large US company during 2017–2019, with statistically significant results reported, adjusted for sex, age, and year. **Results:** The percentage of employees completing the HRA increased from 23.9% in 2017 to 28.4% in 2018 to 32.3% in 2019. These employees were more likely women, middle aged, have lower health care costs, remain employed from year to year, and have better health behaviors and biometric scores. If all employees looked like employees completing the HRA, total medical costs would be 17% lower. If all employees looked like employees completing the HRA who had a health perception rating (1–10 [excellent]) of 7–8 (57.4%) or 9–10 (25.2%) vs. 1–6, total medical costs would be 21.9% and 25.6% lower, respectively. **Conclusions:** A minority of employees completed the worksite HRA. Basing overall employee health risks on the HRA underestimates health risks and can result in a poorly representative health intervention program. *Int J Occup Med Environ Health.* 2022;35(4):449–57

Key words:

employment, behavior, health care costs, health risk assessment, worksite wellness, health perception

INTRODUCTION

Many companies have adopted worksite wellness programs that include a Health Risk Assessment (HRA) to help employees identify health risks and manage chronic disease conditions. According to the Workplace Health in America Survey 2017, 39% of worksites with 10–24 employees, 60% of worksites with 50–99 employees, and 92% of worksites with ≥ 500 employees have a wellness program [1]. In general, as the number of employees grows, the likelihood of a company offering a wellness

program to its employees increases [2]. The number of years in business is also positively associated with offering a worksite wellness program [2]. Studies have shown that improving the health and safety of workers can improve productivity [3–7]. Identifying health care cost savings associated with lifestyle changes motivated by worksite wellness programs is more challenging. The immediate health care cost savings typically seen from worksite wellness programs tend to occur through disease management rather than lifestyle change [8]. However, lifestyle

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change has long-term implications for lowering health care costs.

Many companies provide workers the opportunity to complete an HRA, particularly those companies that offer wellness programs. Health risk assessments tend to include questions about health status, medical history, and lifestyle. For small firms, HRAs are typically administered through an insurer. Among larger companies, they are generally included as part of a wellness program. According to the KFF Employer Health Benefits Survey 2019 [9], 54% of companies with 25–199 workers, 63% of companies with 200–999 workers, 70% of companies with 1000–4999 workers, and 75% of companies with ≥ 5000 workers offer their employees an HRA.

The Wellness Council of America presented specific benefits of conducting an HRA in the workplace, such as providing employers an understanding of the collective health risks of employees, as well as worker productivity as it relates to health risks [10]. In turn, important and necessary interventions can be incorporated that address health risks and productivity issues. Personal health assessments can also provide benchmark health information to employees, which can identify areas where behavior change is needed.

From an employer perspective, the hope is that HRA data on health risks is representative of all employees. However, completing a worksite HRA tends to be optional. As such, the information available from the HRA is rarely fully representative of all employees.

The purpose of this study is to assess the representativeness of those completing an employer sponsored HRA in terms of sex and age, remaining employed from year-to-year, and health care costs for a large US company. The authors hypothesize that those who choose to complete the HRA compared with those who do not will differ according to these variables. If so, the decision about the need for and appropriate type of intervention may overlook some of the most vulnerable employees.

MATERIAL AND METHODS

Setting

This study involves employees of the Municipalities, Colleges, Schools Insurance Group (MCSIG). Employees with MCSIG insurance during 2017 through 2019 were included in the study. Health care costs and use data were linked to the eligible employees. All employees were encouraged to participate in the MCSIG Healthy Rewards Program (HRP).

Healthy Rewards Program

The design of the program adhered to certain fundamentals of the Centers for Disease Control and Prevention's Total Worker Health Approaches [11]. Specifically, MCSIG management was committed to the safety and health of all workers, company leadership received input from employees as they designed the HRP, and participation in the program was voluntary and confidential. The HRP allowed participants to earn up to USD 250 each year by completing specific health actions, including a Health Risk Assessment (HRA). Completing the HRA was required among program participants.

Health Risk Assessment

The HRA asked questions about date of birth, sex, exercise, sleep, diet (fruit, vegetable, and whole grain intake), smoking, alcohol drinking, seatbelts, mental health (depression, stress, loneliness), social support, health perception, life satisfaction, job satisfaction, productivity, absenteeism, health care visits, hospital stays, emergency room visits, body mass index, blood pressure, cholesterol (total, HDL, LDL), and glucose levels. Exercise, sleep, and smoking habits were measured in days/week, based on the questions "How many days per week do you usually exercise?", "During the past week, how many days did you get enough sleep so that you awoke feeling rested and refreshed?" and "During the past week, how many days did you use cigarettes or cigars?". Fruit, vegetable, and grain intake were measured as typical

number of servings per day. Alcohol intake was according to the average number of alcoholic beverages consumed each day. Mental health variables were in terms of the past 3 months and involved the number of times their normal, daily routine was disrupted because of specific problems (e.g., depression, stress, loneliness). Social support is defined as a friend or family member being available to share personal challenges or issues. Health perception, life satisfaction, job satisfaction, and productivity were each measured on a scale 1–10 (best).

Absenteeism, health care visits, hospital stays, and emergency room visits applied to the past year. Body mass index (kg/m^2) was based on self-reported height and weight. Biometric measures were classified as healthy, at risk, and high: blood pressure (systolic ≤ 120 mm Hg and diastolic ≤ 80 mm Hg, systolic 121–139 mm Hg and diastolic 81–89 mm Hg, and systolic ≥ 140 mm Hg and diastolic ≥ 90 mm Hg, respectively); cholesterol (< 200 mg/dl, 200–239 mg/dl, ≥ 240 mg/dl); LDL-cholesterol (≤ 130 mg/dl, 131–159 mg/dl, and ≥ 160 mg/dl); fasting glucose (< 100 mg/dl, 100–125 mg/dl, and ≥ 126 mg/dl); and HDL-cholesterol (≥ 45 mg/dl or ≥ 40 mg/dl as normal values for women and men, respectively).

Files of eligible members, annual medical claims data, and annual wellness program participation were linked using a common identifier number. Analyses are based on the linked data files.

Statistical analysis

Variables are described using counts, percentages, means, and standard deviations. The prevalence of HRA completion is compared according to sex, age, and calendar year. Log-binomial regression was used to assess the prevalence of participation. Medical annual total costs, claims, and average cost per claim are presented. Mean estimates of these variables are expressed according to HRA completion, sex, age, and year. Mean estimates are also shown for categories of Health Perception. Regression models were used to estimate mean annual total costs, claims, and aver-

age cost per claim according to HRA completion, adjusted for sex, age, and year. Two-sided tests of significance were based on the 0.05 level against a null hypothesis of no association. Data was evaluated using the statistical software package SAS (Base SAS 9.4; SAS Institute, Inc., 2014).

RESULTS

The number of employees was 9036 in 2017, 9461 in 2018, and 7883 in 2019. Mean age slightly decreased over these years: $M \pm SD$ 46.5 \pm 12.7, 46.1 \pm 12.8, and 45.9 \pm 12.8 ($F = 5.37$, $p = 0.0047$), respectively. A greater proportion of employees were female (63.4%). This proportion did not significantly change across the study years.

The proportion of employees completing the HRA significantly increased from 23.9% in 2017 to 28.4% in 2018 to 32.3% in 2019 ($\chi^2 = 151.9$, $p < 0.0001$). Approximately 93.6% of those who completed the HRA also participated in other elements of the Healthy Rewards Program. The proportion of employees completing the HRA sig-

Table 1. Prevalence of completing the Personal Health Assessment (HRA) according to sex, age, and year among Municipalities, Colleges, Schools Insurance Group employees, 2017–2019, California, USA

Variable	HRA [%]	RR ^a	95% CI
Gender			
men	20.05	1.00	–
women	32.74	1.65	1.57–1.72
Age			
17–29 years	27.42	1.00	–
30–39 years	33.28	1.24	1.16–1.32
40–49 years	32.44	1.20	1.13–1.28
50–59 years	29.78	1.10	1.03–1.17
≥ 60 years	14.41	0.53	0.49–0.58
Year			
2017	23.94	1.00	–
2018	28.45	1.18	1.13–1.24
2019	32.45	1.34	1.27–1.40

^aAdjusted for sex, age, and year.

Table 2. Total cost, number of claims, and average cost per claim by Personal Health Assessment (HRA) status, sex, age, and year among Municipalities, Colleges, Schools Insurance Group employees, 2017–2019, California, USA

Variable	Claims [n]				Cost [USD]							
					total				per claim (M)			
	β	SE	t	p	β	SE	t	p	β	SE	t	p
β_0	-12.86	1.46	-8.78	<0.0001	-1500.82	384.33	-3.91	<0.0001	31.33	3.72	8.43	<0.0001
HRA												
no	0.00				0.00				0.00			
yes	-2.41	0.77	-3.12	0.0018	-849.99	202.63	-4.19	<0.0001	-4.91	1.96	-2.50	0.0123
Gender												
male	0				0				0			
female	8.80	0.72	12.29	<0.0001	1090.39	187.78	5.81	<0.0001	18.72	1.82	10.31	<0.0001
Age	0.75	0.03	27.94	<0.0001	98.62	7.05	13.98	<0.0001	0.61	0.07	8.92	<0.0001
Year												
2017	0.00				0.00				0.00			
2018	6.72	0.82	8.23	<0.0001	790.89	214.21	3.69	0.0002	4.75	2.07	2.29	0.0219
2019	3.15	0.86	3.67	0.0002	1030.29	224.89	4.58	<0.0001	11.78	2.17	5.42	<0.0001

Slope estimates adjusted for sex, age, and year.

nificantly varied according to sex, age, and year (Table 1). For example, women were 65% more likely than men to complete the HRA, employees aged 30–39 years were 24% more likely than those aged 17–29 years to complete the HRA, and employees in 2018 were 18% more likely to complete the HRA than those in 2017.

Completing the HRA was associated with a greater chance of remaining employed from year-to-year. Specifically, those employed in 2017 who completed the HRA were 14.8% (95% CI: 13.7–16.0) more likely than those who did not complete the HRA to be employed in 2018, after adjusting for sex and age. From 2018 to 2019, the corresponding adjusted estimate was 55.7% (95% CI: 52.8–28.8).

To identify how total cost, number of claims, and average cost per claim varied according to HRA completion status, regression analysis was performed (Table 2). There was no difference in total cost for employees who only completed the HRA versus completed the HRA and other Healthy

Rewards Program activities. Hence, these 2 groups were combined in the table. For those who completed the HRA, average annual cost was USD 849.99 less, average annual number of claims was USD 2.41 less, and average annual cost per claim was USD 4.91 less than those who did not complete the HRA, after adjusting for sex, age, and year.

Employees completing the HRA responded to a question about their own health perception (1–10 [excellent]) and other selected health risks (Table 3). The variables in the table each positively correlated with health perception significantly. In other words, health perception significantly predicted a host of other health risks.

Total cost, number of claims, and average cost per claim are each separately regressed on health perception, sex, age, and year (Table 4). Employees with higher health perception experienced lower total cost and number of claims, but no difference in average cost per claim, after adjusting for sex, age, and year.

Table 3. Selected behavior, perspective, and biometric measures according to health perception among Municipalities, Colleges, Schools Insurance Group employees, 2017–2019, California, USA

Variable	Summary statistics			Health perception			p
	M±SD	min.	max	0–6 (17.4%)	7–8 (57.4%)	9–10 (25.2%)	
Health perception scale ^a	7.62±1.40	1	10				
Exercise [days/week]	3.45±1.46	0	>5	2.41	3.48	4.12	<0.0001
Sleep [day/week enough sleep]	4.65±1.77	0	7	3.61	4.60	5.50	<0.0001
Fruit servings [n/day]	2.36±1.22	0	>5	1.92	2.31	2.77	<0.0001
Vegetable servings [n/day]	2.70±1.27	0	>5	2.29	2.64	3.13	<0.0001
Whole grain servings [n/day]	2.08±1.17	0	>5	1.85	2.03	2.37	<0.0001
Alcohol consumption [drinks/day] (M)	0.43±0.78	0	>7	0.45	0.46	0.37	<0.0001
Smoking [days/week]	0.07±0.65	0	7	0.17	0.06	0.02	<0.0001
Seat belt use while in a vehicle [%]	99.37±5.51	0	100	98.70	99.37	99.83	<0.0001
Depression (past 3 months) [n]	0.92±1.51	0	>7	1.64	0.92	0.44	<0.0001
Loneliness (past 3 months) [n]	0.58±1.26	0	>7	1.02	0.56	0.32	<0.0001
Stress (past 3 months) [n]	1.97±1.97	0	>7	2.97	2.01	1.21	<0.0001
Social support ^b	0.96±0.19	0	1	0.94	0.97	0.97	0.0006
Hospital stays (past year) [n]	0.10±0.63	0	>8	0.16	0.10	0.07	0.0002
Emergency room (past year) [n]	0.14±0.46	0	>8	0.23	0.13	0.10	<0.0001
Life satisfaction scale ^c	8.37±1.36	1	10	7.07	8.36	9.30	<0.0001
Job satisfaction scale ^c	8.29±1.60	1	10	7.45	8.25	8.97	<0.0001
Productivity scale ^d	8.75±1.15	2	10	8.10	8.71	9.32	<0.0001
Absenteeism [days]	1.90±2.17	0	>8	2.59	1.93	1.34	<0.0001
BMI [kg/m ²]	28.10±6.23	10	82	32.92	27.89	25.22	<0.0001
Blood pressure (mm Hg) ^e	1.27±0.54	1	3	1.48	1.26	1.14	<0.0001
Cholesterol (mg/dl) ^e							
total	1.27±0.52	1	3	1.41	1.27	1.17	<0.0001
HDL	2.77±0.50	1	3	2.63	2.76	2.87	<0.0001
LDL	1.20±0.46	1	3	1.33	1.20	1.11	<0.0001
Glucose (mg/dl) ^e	1.14±0.41	1	3	1.32	1.14	1.06	<0.0001
Health Rewards Program [pts] ^f	9.94±3.91	0	24	9.03	9.96	10.63	<0.0001

^a 1–10 (excellent).

^b 1 – yes, 0 – no.

^c 1–10 (totally satisfied).

^d 1–10 (best job perform).

^e 1 – healthy, 2 – borderline, 3 – high.

^f Applies to just those employees who completed the HRA. Participants could earn up to 28 pts.

Table 4. Total cost, number of claims, and average cost per claim according to health perception among Municipalities, Colleges, Schools Insurance Group employees, 2017–2019, California, USA

Variable	Claims [n]				Cost [USD]							
					total				per claim (M)			
	β	SE	t	p	β	SE	t	p	β	SE	t	p
β_0	-11.38	2.37	-4.81	<0.0001	202.79	690.80	0.29	0.7691	38.72	7.89	4.91	<0.0001
Health perception scale ^a												
0–6	0.00				0.00				0.00			
7–8	-3.12	1.30	-2.4	0.0162	-1335.64	378.46	-3.53	0.0004	-7.86	4.32	-1.82	0.069
9–10	-5.61	1.49	-3.77	0.0002	-1572.82	434.67	-3.62	0.0003	-4.63	4.97	-0.93	0.3516
Gender												
male	0.00				0.00				0.00			
female	11.58	1.08	10.73	<0.0001	1652.28	315.08	5.24	<0.0001	21.67	3.60	6.02	<0.0001
Age	0.65	0.04	15.45	<0.0001	53.09	12.26	4.33	<0.0001	0.35	0.14	2.49	0.0126
Year												
2017	0.00				0.00				0.00			
2018	7.57	1.18	6.45	<0.0001	1039.69	342.92	3.03	0.0024	7.15	3.92	1.83	0.068
2019	7.34	1.19	6.17	<0.0001	1369.99	347.13	3.95	<0.0001	16.59	3.97	4.18	<0.0001

^a Health perception scale: 1–10 (excellent).

Slope estimates were simultaneously computed; estimates adjusted for sex, age, and year.

Average annual medical cost for the years 2017–2019 is presented by HRA completion status and health perceptions classification in Figure 1. Average annual total medical cost does not significantly differ between those who did not complete the HRA and those who did if the employees' health perception rating is 0–6. The average annual total medical cost is significantly lower for those who completed the HRA with a health perception rating of 7–8 or 9–10. Total medical cost for all employees during 2017–2019 was USD 108 147 969. If all employees experienced the same costs as non-HRA employees, total medical costs would be USD 115 106 961 (6.43% higher). If all employees experienced the same costs as the HRA completers, total medical costs would be USD 89 597 614 (17.2% lower). If all employees had a health perception rating of 0–6 then total medical costs would be USD 117 797 343 (18.9% higher). If all employees had a health perception rating of 7–8, then total medical costs

would be USD 84 502 822 (21.9% lower). If all employees had a health perception rating of 9–10, then total medical costs would be USD 80 494 400 (25.6% lower).

DISCUSSION

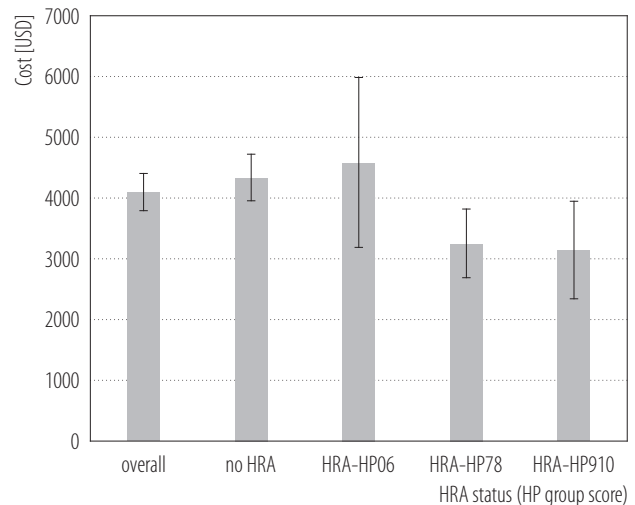
Employer-sponsored worksite HRAs provide information about the collective and individual health risks of employees, along with worker productivity as it relates to health risks [10]. In turn, employers can use this information to develop interventions that address health risks and productivity. Additionally, employees can use their own HRA results to identify where lifestyle changes are needed. Hence, employers that provide health benefits to their employees are increasingly offering HRAs [9]. However, identifying company-level health risks and worker productivity in relation to the health risks is problematic when only a small proportion of employees complete the HRA.

In a review of several US companies, the proportion completing a worksite HRA was 39% in 2017 and 42% in 2019 [9]. Completion rates in the current study similarly increased, but at a lower level (23.9% in 2017 and 32.5% in 2019). If employers intend to use this information to develop interventions that address health risk and productivity issues in the workplace, they should be aware that this information likely underestimates overall health risks and overestimates productivity. As seen in this study, this is because those completing the HRA are collectively a healthier group of employees with lower health care costs, use, and average costs per claim, after adjusting for sex, age, and year.

In comparing health care costs and use between those completing the HRA and those not completing the HRA, it was important to adjust for sex, age, and year. Each of these variables is a potential confounder because of their independent association with both the HRA and health care costs.

The study showed that women (vs. men) were more likely to complete the HRA, as well as more likely to participate in the company's Health Rewards Program. In a consistent manner, studies have shown that women are more likely to participate in employer-sponsored wellness programs [12–14]. In a large survey of US companies with at least 2000 employees, it was observed that women were more likely to participate in health screening (61% vs. 57%), fitness centers (57% vs. 52%), web-based wellness programs (54% vs. 50%), weight-management (60% vs. 47%), and health coaching (54% vs. 44%) [13]. A Rand Fortune 100 study found that companies with a higher proportion of female employees were more likely to offer wellness programs [2].

The current study identified employees ages 30–59 years as more likely to complete the HRA. The youngest age group may have lower completion rates because they perceive less of a need for the information acquired from an HRA. Employees ages ≥ 60 years were half as likely to complete the HRA. This result is unclear and further investigation is warranted.



HRA – health risk assessment; HP – health perception (06 – score 0–6, 78 – score 7–8, 910 – score 9–10).

Data given as mean and 95% confidence interval.

Figure 1. Annual total medical cost among employees of Municipalities, Colleges, Schools Insurance Group (MCSIG), 2017–2019, California, USA

Those who completed the HRA were more likely to remain employed from year to year. Consistent with this result, a literature review found a positive association between physical health and employment and re-employment [15]. Further, those who completed the HRA had lower health care costs (better health), which likely explains higher job satisfaction and productivity. A meta-analysis showed that healthier individuals have greater job satisfaction [16]. Healthier employees also tend to be more productive [3–7]. Further research may explore ways to increase participation of less healthy people in HRAs and worksite wellness programs.

Personal health perception predicted health care costs and correlated with a number of health risks. No significant difference was observed in health care costs between employees who completed the HRA but had lower personal health perception ratings (0–6) and those who did not complete the HRA. Hence, to understand the health risks of those employees not completing the HRA, the authors can generalize the findings of less healthy employees who completed the HRA.

CONCLUSIONS

A minority of employees completed the worksite HRA. Employees completing the HRA are collectively a healthier group of people with lower health care costs, use, and average costs per claim. In general, completing the HRA is a marker of better health perception, health, and lower health risks. This result persists after adjusting for sex, age, and calendar year. The potential employer cost savings if all employees looked like those completing the HRA is substantial. In addition to the health care cost savings, there would be greater job satisfaction, productivity, and retention. Basing overall employee health risks on just an HRA could result in a misleading picture of health risks and a poorly representative health intervention program.

REFERENCES

1. Linnan LA, Cluff L, Lang JE, Penne M, Leff MS. Results of the workplace health in American survey. *Am J Health Promot.* 2019;33(5):652-65. <https://doi.org/10.1177/0890117119842047>.
2. Mattke S, Kapinos, K, Caloyeras JP, Taylor EA, Batorsky B, Liu H, et al. Workplace wellness programs: Services offered, participation, and incentives; 2014 [cited 2021 April 11]. Available from: https://www.rand.org/pubs/research_reports/RR724.html.
3. Song Z, Baicker K. Effect of a workplace wellness program on employee health and economic outcomes: A randomized clinical trial. *J Am Med Assoc.* 2019;321(15):1491-501. <https://doi.org/10.1001/jama.2019.3307>.
4. National Institute for Occupational Safety and Health (NIOSH). Understanding small enterprises: proceedings from the 2017 conference; Cunningham T, Schulte P, Jacklitsch B, Burnett G, Newman L, Brown C, Haan M, Eds.; DHHS (NIOSH) Publication No. 2019-108; U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health: Cincinnati, OH, USA; 2018.
5. Mattke S, Liu HH, Caloyeras JP, Huang CY, Van Busum KR, Khodyakov D, et al. Workplace wellness programs study. Final report; 2013 [cited 2021 April 11]. Available from: https://www.rand.org/pubs/research_reports/RR254.html.
6. Merrill RM, Aldana SG, Pope JE, Anderson DR, Coberley CR, Whitmer RW. Presenteeism according to healthy behaviors, physical health, and work environment. *Popul Health Manag.* 2012;15(5):293-301. <https://doi.org/10.1089/pop.2012.0003>.
7. Mitchell RJ, Bates P. Measuring health-related productivity loss. *Popul Health Manag.* 2011;14(2):93-8. <https://doi.org/10.1089/pop.2010.0014>.
8. RAND Corporation Brief; 2014. Do worksite wellness programs save employers money? [cited 2021 April 11]. Available from: https://www.rand.org/content/dam/rand/pubs/research_briefs/RB9700/RB9744/RAND_RB9744.pdf.
9. Claxton G, Rae M, Damico A, Young G, McDermott D. Employer health benefits: 2019 annual survey. Section 12: health and wellness programs; 2019 [cited 2021 April 6]. Available from: <https://www.kff.org/report-section/ehbs-2019-section-12-health-and-wellness-programs/>.
10. Hunnicutt D. The 10 benefits of conducting a personal health assessment. *WELCOA Abs Advant.* 2008;7(7):2-9.
11. National Institute for Occupational Safety and Health (NIOSH). Fundamentals of total worker health approaches: essential elements for advancing worker safety, health, and well-being. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, 2016.
12. Merrill RM, Hull JD. Factors associated with participation in and benefits of a worksite wellness program. *Popul Health Manag.* 2013;16(4):221-6.
13. OPTUM. How gender and work site affect employee engagement: A joint national business group Optum study; 2014 [cited 2021 March 23]. Available from: https://www.optum.com/content/dam/optum/resources/whitePapers/100819_Optum_Health_Gender-Worksite_Engagement_Final.pdf.

14. Merrill RM. Medical claims according to wellness program participation for a large insurance company in the United States. *J Occup Environ Med.* 2018;60(11):985-9. <https://doi.org/10.1097/JOM.0000000000001417>.
15. Hergenrather KC, Zeglin RJ, McGuire-Kuletz M, Rhodes SDK. Employment as a social determinant of health: A systematic review of longitudinal studies exploring the relationship between employment status and physical health. *Rehab Res Policy Edu.* 2015;29(1):2-26. <https://doi.org/10.1891/2168-6653.29.1.2>.
16. Faragher EB, Cass M., Cooper, C. L. The relationship between job satisfaction and health: A meta-analysis. *J Occup Environ Med.* 2005;62(2):105-12. <https://doi.org/10.1136/oem.2002.006734>.