The Measurable Benefits of a Workplace Wellness Program in Canada

Results After One Year

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Objective: The aim of this study was to evaluate the impact of an employee wellness program in Canada. **Methods:** A comprehensive program including web-based lifestyle challenges was evaluated with annual health screenings. **Results:** Among 730 eligible employees, 688 (94%) registered for the program, 571 (78%) completed a health screening at baseline, and 314 (43%) at 1 year. Most (66%) employees tracked their activity for more than 6 weeks. At 1-year follow-up, there were significant clinical improvements in systolic blood pressure -3.4 mm Hg, and reductions in poor sleep quality (33% to 28%), high emotional stress (21% to 15%), and fatigue (11% to 6%). A positive dose–response was noted where the greatest improvements were observed among those who participated the most. **Conclusion:** The program had high employee engagement. After 1 year, the benefits included clinically important improvements in physical and mental health.

Learning Objectives

- Discuss the current status of implementation and evaluation of workplace health promotion programs, with special reference to Canada.
- Summarize the key elements and implementation of the LIVE IT wellness program developed by one large Canadian company.
- Discuss the findings on one-year program evaluation, including employee engagement and changes in physical and mental health metrics.

Comprehensive workplace wellness programs, including health risk assessment, biometric screening, and lifestyle management interventions, are common in the United States where a sizable proportion of health care costs are borne by employers. Despite the availability of positive outcome data from many programs, the overall long-term effectiveness and cost-effectiveness of wellness programs in the American workplace remains controversial.[1,2] Outside of the United States, comprehensive workplace wellness programs are generally less common.[3] However, a 2014 Towers Watson survey of 892 employers in 15 countries found that a healthy workforce is becoming a global priority for employers. As a result, the number of employers providing wellness programs has increased in many countries. Among these countries, Canada remains one of the least developed markets despite the close proximity to the United States.[3]

The limited support for wellness programs in Canada may be due to the fact that Canadian employers contribute only modestly to the health care costs of their employees given a national health care program that covers most inpatient, outpatient, and physician costs.[4] Nonetheless, there is growing interest in workplace wellness programs, as the health care costs covered by Canadian employers rise due to the increasing costs of drug plans, paramedical benefits, and long-term disability coverage.[5]

Organizational wellness offerings are a tangible way for employers to support the health and overall well-being of employees. However, in order to be effective, employees must use the services being offered. In Canada, wellness program participation rates are extremely low, with only 11% of employees saying they definitely participate on a regular basis and another 23% participating only occasionally.[6] Participation rates from the United States are generally much higher, likely due to the availability of substantial financial incentives to participate including employee discounts on the premiums for health coverage.[1,7,8]

While promoting physical activity is a widely used intervention internationally, published Canadian clinical outcome data resulting from such programs is scarce and we could not find any trial providing clinical outcomes over one year or more. A 2011 review by Brown et al[9] identified 20 trials evaluating the impact of physical activity interventions in the workplace. None were in Canada. It therefore remains to be determined whether workplace programs can demonstrate measurable, sustainable improvements in the health of Canadian employees.

In 2014, a Canadian national company implemented a comprehensive workplace health promotion program to improve the lifestyle habits of employees and reduce their risks of developing preventable physical and mental health problems. The program incorporated evidence-based practices and included a systematic evaluation at baseline and then annually. The incentives were modest compared with those commonly reported in the United States.[4,10]

The research objectives of the program during the first year were to monitor employee engagement and enrollment and demonstrate clinically important improvements in physical and mental health. Herein, we provide the results.

METHODS

Study Design

In 2014, Merck Canada Inc. Kirkland, Quebec, implemented a comprehensive wellness program (LIVE IT). It included strong senior management support and dedicated internal resources for a

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clear program strategy to build and sustain employee participation based on evidence-based best practices.[11]

At the outset, it was decided to provide only minimal material incentives to promote behavior change and focus on intrinsic motivation. As employee communication was considered critical, the program was under the direction of the Communications Department. Employees at head office and across Canada volunteered to be ‘‘Wellness champions’’ and provide a network of support. The workplace partnered with a supplier, Clinemetrica Inc., that developed the program with staff from the McGill Comprehensive Health Improvement Program and the Division of Clinical Epidemiology at the McGill University Health Centre. The program included annual biometric health screenings, health awareness initiatives, a web-based e-health platform, an onsite wellness consultant, and ongoing data analysis to evaluate the program's effectiveness.

A pre-post within-subjects design was used to evaluate the wellness program. The study protocol was approved by Institutional Review Board Services (#IRB00000776 and #IRB00005290).

All employees were eligible to participate and participation was voluntary and free of charge. During the program launch in September 2014, approximately half of the eligible participants were at head office in Montreal and the other half were field based across Canada. Recruitment included on-site information stations, posters, and email announcements. To register, participants provided online consent to have their data used for research purposes, then created an account that provided access to (i) an onsite biometric screening program (either at head office or a national sales meeting), (ii) the e-health platform, (iii) a wellness consultant, and (iv) other wellness initiatives.

Measures

The biometric health screenings included collection of the following information: gender, date of birth, personal and family history of cardiovascular disease (CVD) and diabetes, smoking status, height, weekly minutes of moderate and vigorous physical activity, medication use for diabetes, hyperlipidemia, and hypertension (self-reported). The following variables were measured, including weight using a digital scale (Tanita HD351, Tanita Inc., Arlington Heights, IL), waist circumference (measured at the level of the umbilicus), blood pressure using the lowest of three measures taken 1 minute apart after being seated for 5 minutes (Life Source UA-767 plus, A7D Medical, Milpitas, CA), total and high-density lipoprotein (HDL) cholesterol using the Cholestech LDX Cholesterol Analyzer (Alere San Diego, San Diego, CA), and glycated hemoglobin (HbA1c) using the A1CNow+ (Polymer Technology Systems Inc., Indianapolis, IN).

The employees entered their data directly into the web-based platform. Validated health assessments included 10-year risk of CVD using Framingham equations[12] and Cardiovascular age (CVage). CVage is determined using a validated disease simulation model.[13] It is calculated as the patient's age minus the difference between his or her estimated remaining life expectancy (adjusted for coronary and stroke risk) and the average remaining life expectancy of individuals of the same age and gender (www.cardiovascular-age.com). Knowing one's CVage has been proven to improve the clinical management of high cholesterol and hypertension.[14,15]

Employees were also encouraged to complete other online assessments to measure sleep, stress, fatigue, and depression. See Table 1 for the instruments used, as well as their dimensions. After completing the health risk assessments, employees had access to an online dashboard that summarized each assessment and informed users when a risk factor warranted attention (see Table 1 for high risk cut-points for each health assessment).[16–26]

Educational Content

Evidence-based educational modules were available for each assessment area. The modules provided employees with clinically relevant information to help them modify lifestyle habits that could impact their health. Each module also included an educational quiz. A health library offered more in-depth information. The website featured educational modules on topics such as blood pressure management, healthy eating, smoking cessation, stress management, and weight loss.

Online Challenges

Following the baseline screening, all employees were invited to join an 8-week on-line physical activity challenge with team leaders (champions) who had been identified across various business departments. All members of the team recorded their physical activity online using a pedometer (provided free of charge), digital tracker, and/or tracked the time spent in specific physical activities, which was then converted into step equivalents using metabolic equivalent (MET) intensities.[27] The activity challenge offered multiple features to motivate participants, including goal setting, a message board where participants could encourage their teammates, and reminder emails if they had not logged their activity for 7 consecutive days. Employees were offered small incentives [skipping ropes, exercise towels and water bottles with the LIVE IT (corporate Wellness Program) logo] to encourage daily tracking of physical activity. Since the launch of the program, salaried employees were given the flexibility of exercising anytime during work hours as long as it did not interfere with their work.

Following the initial physical activity challenge, a variety of other challenges and programs were offered over the course of the year including a 10-week team healthy weight challenge designed to increase activity and healthy eating, individual activity challenges based on specific activity goals (5500 steps per day to 30,000 steps/day), an online training program for a 5 or 10 km walk/run race, and

TABLE 1. Dimensions and Cut points for the Online Health Risk Assessments

Measure	Instrument	Dimensions	High-Risk Cut-Point
Cardiovascular age	CLEM[13]	Estimates annual probability of fatal and nonfatal CVD events	Age gap ≥1 year
10-year cardiovascular disease risk	Framingham[12]	% risk of developing CVD over 10 years	Highest tertile of risk compared with other age and gender-matched Canadians[16]
Sleep quality	ISI[17,18]	7 questions; Total score from 0 to 28	≥ 8 subthreshold insomnia[19]
Emotional stress	PSS 10[20]	10 questions; Total score from 0 to 40	≥18 high stress (1 standard deviation above the mean)[21]
Fatigue	MFI[22,23]	4 questions; Total score 4–20	≥16 high fatigue [23]
Depression	CES-D[24–26]	20 questions; Total score 0–40	≥16 subthreshold depressive symptoms[24]

Age gap, cardiovascular age – actual age; CES-D, Centre for Epidemiologic Studies – Depression; CLEM, Cardiovascular Life Expectancy Model; CVD, cardiovascular disease; ISI, Insomnia Severity Index; MFI, General fatigue subscale of the Multidimentional Fatigue Inventory; PSS, Perceived Stress Scale.

lunchtime walk/run groups with a running coach for head office employees, as well as lunch and learn sessions on a variety of fitness and nutrition related topics (videotaped for field employees).

Analysis

During the first year of the program, the primary outcomes of interest were the employee participation rates for the various program offerings. This included the number of employees who registered on the online platform, completed the annual biometric screenings, and participated in the healthy lifestyle challenges. As physical activity tracking was a key element of the lifestyle interventions, we used the frequency of daily website logins as a proxy for the level of participation in the program. We also evaluated the association between a healthy lifestyle at baseline (physical activity and body weight) and better health measures at baseline using linear regression models adjusting for age and gender.

The second primary outcome was the impact of the program on physical and mental health measures, including blood pressure, blood lipids, physical fatigue, sleep quality, mental stress, and depressed mood. We analyzed matched pre-post comparisons with 95% confidence intervals for the within-subject mean differences. We also used linear regression models to estimate a dose–response effect by examining the association between the frequency of website usage and the changes in physical and mental health measures. We estimated the change over time using a linear regression model adjusted for age and gender.

RESULTS

Participation

Among the 730 employees who were eligible to participate in the program, 688 (94%) registered on the website and 571 (78%) completed a cardiometabolic biometric screening at one of the 9 baseline risk screening days. Slightly fewer employees completed the mental health assessments, including sleep (67%), stress (66%), fatigue (63%), and depression (60%). For those employees who had their baseline risk assessed, 90 (16%) tracked their activity for a total of 183 days or more over the course of the year (not necessarily consecutive), 202 (35%) tracked their activity between 71 and 182 days, 99 (17%) tracked their activity between 43 and 70 days, 67 (12%) tracked their physical activity for 42 days or less, and 113 employees (20%) did not participate in any on-line challenge.

Baseline Results

Fifty-eight percent of employees participating in the program were female. The average age of employees was 45 years (see Table 2). Forty-five percent of employees worked at head office with the rest working in the field across Canada. Poor lifestyle habits were infrequent: 3.7% reported being current smokers, and 16% were considered sedentary using self-reported physical activity levels (weekly METs < 720; using an estimate of 4 METs/ min moderate exercise and 8 METs/ min vigorous exercise).[27] On average, the calculated CVage was 1.5 years less than participant's actual age (CVage gap). However, there were a number of physical and mental health outcomes where there was room for improvement: 37% of employees were overweight [body mass index (BMI) 25 to 30 kg/m^2] and 14% were obese (BMI >30 kg/m^2), 24% had high stress scores [≥18 on Perceived Stress Scale (PSS)], 34% were poor sleepers [≥8 on Insomnia Severity Index (ISI)], 10% had a high depressive symptoms [≥16 on Centre for Epidemiologic Studies Depression scale (CES-D)], and 10% had high fatigue [≥16 on Multidimentional Fatigue Inventory (MFI)].

Healthy lifestyle habits were associated with better health at baseline. There were clinically important associations between baseline BMI and weekly physical activity (METs) with a number of health risk factors (see Table 3). Poor lifestyle habits were associated with lower physical and mental health metrics. A higher BMI and lower weekly physical activity was associated with increased fatigue, a higher total cholesterol/HDL ratio, an increased CVage gap, and a higher HbA1c. A higher BMI was also associated with higher systolic and diastolic blood pressure and lower physical activity was associated with poorer sleep quality and increased stress.

TABLE 2. Baseline Characteristics of Wellness Program Participants ($n = 571$)

Age (mean ± SD; years)	45.1 ± 7.4
Female	332 (58%)
Work at head office	259 (45%)
Known cardiovascular disease	4 (0.7%)
Family history of cardiovascular disease	122 (21%)
Known diabetes	16 (2.8%)
Hemoglobin A1c (mean ± SD; %)	5.2 ± 0.4
Smokers	21 (3.7%)
CVage gap (mean ± SD; years)	−1.5 ± 2.3
Systolic blood pressure (mean ± SD; mm Hg)	121 ± 15
Diastolic blood pressure (mean ± SD; mm Hg)	80 ± 9
Blood pressure >140/90	100 (18%)
Blood pressure medication	48 (8%)
Total/HDL cholesterol (mean ± SD; mmol/L)	3.5 ± 1.2
Total/HDL cholesterol >4 (♀) or 5 (♂)	102 (18%)
Cholesterol medication	53 (9%)
Body mass index (mean ± SD; kg/m^2)	25.7 ± 4.7
Body mass index 25–29.9 kg/m^2	215 (37%)
Body mass index ≥30 kg/m^2	79 (14%)
Waist circumference (mean ± SD; cm)	90 ± 13
Waist circumference ≥88 cm (♀) or 102 cm (♂)	173 (30%)
Weekly physical activity (mean ± SD; METS)	2,025 ± 1,490
Weekly moderate activity (mean ± SD; METs)	890 ± 779
Weekly vigorous activity (mean ± SD; METs)	1,136 ± 1,128
Physically inactive (weekly METs < 720)	94 (16%)
Emotional stress (PSS) mean score ± SD	13.7 ± 5.7
High stress (≥18 on PSS)	116 (24%)
Sleep quality (ISI) mean score ± SD	6.1 ± 4.8
Poor sleep (≥8 on ISI)	166 (34%)
Depression (CES-D) mean score ± SD	6.2 ± 6.6
High depressive symptoms (≥16 on CES-D)	42 (9.6%)
Fatigue (MFI) mean score ± SD	10.4 ± 3.8
High fatigue (≥16 on MFI)	46 (10%)

CES-D, Centre for Epidemiologic Studies – Depression; CVage gap, CVage – age; ISI, Insomnia Severity Index; MET, Metabolic equivalent; MFI, Fatigue subscale of the Multidimentional Fatigue Inventory; PSS, Perceived Stress Scale.

Outcomes Data

Among 396 employees who attended the second biometric screening following the first year, 314 (79%) had also provided baseline data at the first biometric screening. There were clinical improvements in blood pressure, the total cholesterol/HDL ratio, weekly physical activity, perceived stress, sleep, fatigue, and the 10-year CVD risk (see Table 4). There was also a small increase in weight without an increase in waist circumference.

We also evaluated baseline characteristics of employees who returned for the follow-up screening compared with those who did not after removing 64 employees who had left the company before the follow-up screening. There were no significant differences between these two groups for age, gender, location (field vs head office), or any of the baseline health assessments. The only group difference was for physical activity tracking. The average number of days tracked was higher in those who returned for follow-up (127 compared with 48 days). The actual number of steps recorded on an average tracking day was similar between the two groups (12,834 for those who returned for follow-up compared with 12,768 for those who did not).

TABLE 3. Positive Lifestyle Habits [Physical Activity (Weekly METs) and Body Mass Index] are Associated With Better Health Measures at Baseline*

Health Measure	Physical Activity Estimate (95% CI)	Body Mass Index Estimate (95% CI)
Fatigue (MFI)	−0.51 (−0.79 to −0.34)†	0.13 (0.06–0.21)†
Total cholesterol/HDL	−0.10 (−0.16 to −0.04)†	0.07 (0.05–0.09)†
Hemoglobin A1c	−0.04 (−0.06 to −0.01)†	0.02 (0.01–0.02)†
CVage gap	0.22 (0.10–0.34)†	−0.10 (−0.14 to −0.06)†
Sleep quality (ISI)	−0.31 (−0.62 to −0.02)†	−0.01 (−0.11 to 0.09)
Emotional stress (PSS)	−0.52 (−0.86 to −0.19)†	0.06 (−0.05 to 0.17)
Diastolic blood pressure, mm Hg	−0.35 (−0.86 to 0.15)	0.49 (0.32–0.66)†
Systolic blood pressure, mm Hg	−0.25 (−1.03 to 0.53)	0.65 (0.40–0.91)†

Physical activity is total weekly physical activity in 1000 METs (Metabolic equivalents).
CVage gap, CVage − age; ISI, Insomnia Severity Index; MFI, Fatigue subscale of the Multidimentional Fatigue Inventory; PSS, Perceived Stress Scale.
*Linear regression model adjusted for age and gender.
†Lower and upper 95% confidence intervals do not include 0.

The Impact of Website Usage on the Observed Clinical Improvements

To describe the impact of website usage on body composition, fatigue, and stress, participants were stratified into tertiles based on the number of days that they tracked their activity during the first year (<71 days; 71 to 148 days; >148 days) (see Fig. 1). For every 100 days tracked, BMI decreased by 0.16 kg/m^2 (95% CI: −0.27 to −0.04), waist circumference decreased by 1.4 cm (95% CI: −1.66 to −0.43), the MFI (fatigue) score decreased by 0.5 (95% CI: −0.91 to −0.06), and the PSS (stress) score decreased by 0.7 (95% CI: −0.14 to −0.09).

DISCUSSION

In the first year of a workplace wellness program, employee participation and measurable health benefits are arguably the primary goals. Even the most effective program cannot deliver measurable benefits across the company if only a minority of employees participate.[1,10] The results observed in this workplace program were unusually high compared with the 8% to 25% reported by many Canadian employers[6,28] and included participation rates of 94% for online registration, 78% for baseline assessments, and 66% for completion of at least 6 weeks in an exercise challenge. One can only speculate about how these high rates were achieved, but multiple surveys of program success have suggested that senior management support, dedicated resource for program strategy planning, and a multi-disciplinary communication initiative including local champions may be particularly important.[11] In this case, senior management, including the president, actively participated in all aspects of the program. A comprehensive communication plan [town hall meetings, sales meetings, weekly contact with team leaders (champions), posters throughout the offices, employee testimonials, and email reminders] was also a prominent component.

High participation rates and substantial improvements in physical activity translated into measurable changes in physical

TABLE 4. Changes in Participants Health Measures After 1 Year ($n = 314$)

Health Measure	Pre	Post	Change
Systolic blood pressure, mm Hg)	121.0 ± 14.6	117.7 ± 14.6	−3.4 (−4.7; −2.0)*
Diastolic blood pressure, mm Hg)	79.1 ± 9.4	77.7 ± 9.5	−1.4 (−2.4; −0.4)*
Blood pressure >140/90 mm Hg	44 (14%)	36 (11%)	−2.6% (−6.6; 1.9)
Total/HDL cholesterol ratio	3.55 ± 1.24	3.39 ± 1.21	−0.16 (−0.25; −0.07)*
Total/HDL cholesterol >4 (♀) or 5 (♂)	60 (20%)	47 (16%)	−4.3% (−8.4; 0.4)
Smokers	13 (4.1%)	11 (3.5%)	−0.6% (−1.8; 1.1)
Weight, kg	74.7 ± 16.1	75.2 ± 16.2	0.5 (0.2; 0.9)*
Body mass index ≥30 kg/m^2	39 (12.4%)	40 (12.7%)	0.3% (−1.9; 2.3)
Waist circumference, cm	89.2 ± 12.4	88.7 ± 12.3	−0.4 (−1.0; 0.2)
Waist circumference ≥88 cm (♀) or 102 cm (♂)	94 (30%)	85 (27%)	−2.9% (−6.1; 0.9)
Physical activity (weekly METs)	2102 ± 1616	2472 ± 1763	370 (187; 552)*
Physically inactive (weekly METs < 720)	47 (15%)	34 (11%)	−4.1% (−0.6; 8.4)
Emotional stress (PSS)	13.3 ± 5.5	11.7 ± 5.7	−1.6 (−2.2; −1.0)*
High stress (≥18 on PSS)	54 (21%)	37 (15%)	−6.7% (−11.6; −1.8)*
Sleep quality (ISI)	5.9 ± 4.6	5.3 ± 4.5	−0.6 (−1.0; −0.1)*
Poor sleep (≥8 on ISI)	89 (33%)	77 (28%)	−4.4% (−9.8; 1.4)
Depression score (CES-D)	5.9 ± 6.2	5.6 ± 6.2	−0.3 (−1.1; 0.6)
Depressive symptoms (≥16 on CES-D)	19 (8.9%)	18 (8.4%)	−0.5% (−5.0; 4.2)
Fatigue score (MFI)	10.4 ± 3.8	9.4 ± 3.7	−1.0 (−1.4; −0.6)*
High fatigue (≥16 on MFI)	27 (11%)	15 (6%)	−4.7% (−8.7; −0.7)*
10-year cardiovascular risk (%)	6.6 ± 7.2	6.0 ± 6.6	−0.6 (−1.0; −0.3)*
Cardiovascular age gap, years	−1.8 ± 2.6	−1.9 ± 2.4	0.2 (−0.1; 0.4)

Cardiovascular age gap, Cardiovascular age − age; CES-D, Centre for Epidemiologic Studies − Depression; ISI, Insomnia Severity Index; Mean ± SD. MET, Metabolic equivalent; MFI, Fatigue subscale of the Multidimensional Fatigue Inventory; PSS, Perceived Stress Scale.
*The lower and upper 95% confidence intervals did not include 0.

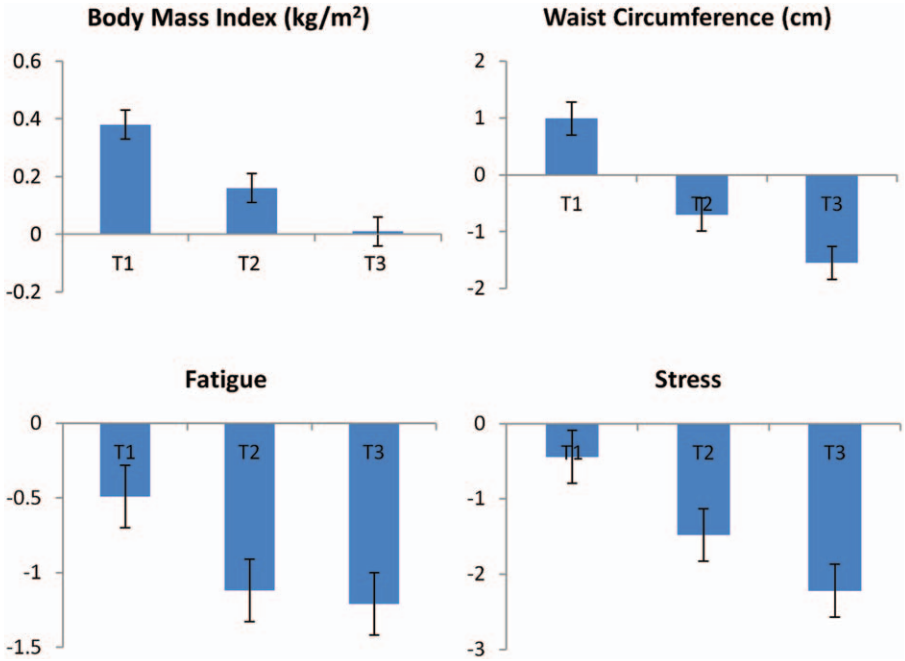

FIGURE 1. The impact of website usage on observed clinical improvements. Mean change in risk factor (SE) stratified by tertiles (T) of tracked activity days. T1 = 0–70 days; T2 = 71–148 days; T3 = 154–441 days. Fatigue is the change in the fatigue subscale of the Multidimensional Fatigue Inventory. Stress is the change in the Perceived Stress Scale score.

and mental health measurements. The average increase in weekly physical activity was 370 METs (+18%), which is equal to about 90 minutes of moderate activity or 45 minutes of vigorous activity. This was associated with a mean reduction in physical fatigue of 10%. The change in systolic and diastolic blood pressure (−3.4/−1.4 mm Hg) was particularly noticeable given that the average blood pressure at baseline was only 121/79 mm Hg. When added to the small improvement in the total cholesterol /HDL ratio of −0.16, the net result is a mean reduction in the CVage gap of 0.2 years. The small weight gain we observed was following an increase in exercise and was without a corresponding increase in waist circumference and we speculate it is most likely due to an increase in muscle rather than fat.

We found similar short-term improvements following an 8-week physical activity challenge in hospital employees where employees tracked their activity using pedometers. There was an improvement in weekly physical activity of 160 METs (+6%), a 10% reduction in fatigue, and a small but significant drop in blood pressure (−2.0/−1.0 mm Hg).[29] However, to demonstrate the sustainability of results (past 8 weeks), in our current study, we implemented other challenges/programs following the initial team physical activity challenge to build on the lifestyle changes that occurred during the initial challenge and we were able to demonstrate larger improvements that were sustained at 1 year.

The 0.2-year reduction in CVage represents an average increased life expectancy of 0.2 years among 396 employees or an estimated 79 person-years of life (0.2 × 396) among approximately 700 eligible employees in the company. If these small but measurable benefits can be maintained, the calculated number needed to treat (NNT) of 11 employees to save a year of life [NNT = (79/700) × 100] is very favorable when compared with the long-term estimated benefits associated with the primary prevention of CVD by medically treating hypertension or hypercholesterolemia.[30,31] We acknowledge the lack of empirical data demonstrating the sustainability of the observed health benefits beyond 1 year. The improvements in the mental health of participants, including a reduction in stress of 12% and an improvement in sleep quality of 12%, are consistent with what we and others have observed previously.[29,32]

As with most employee wellness programs, the primary limitation of this study is the absence of a control group. Although there is no substitute for a control group to prove causality in a clinical trial, the nature of corporate wellness programs often make this option challenging or impossible. We were however able to show a dose–response with those who participated the most (using days that activity was tracked as a proxy) had the greatest improvements in waist circumference, fatigue, and stress. These analyses add further strength to the conclusion that the benefits observed during the wellness program were due to the level of participation in the program.

Another limitation is that we did not have follow-up data on all employees who started the program. Although our follow-up rate of 55% (314/571) is not ideal, it is partially due to employee turnover with 64 individuals leaving the company in the first year. After removing these individuals, our follow-up rate rises to 62% (314/507). It is possible that employees who return for follow-up may be different than those who did not, even though there were no baseline differences between the two groups. There was a difference in the number of days that activity was tracked with employees who returned for follow-up tracking an average of 127 days compared with 48 days for those who did not return. Nonetheless, an average of 48 days of tracking is still substantial, and during this time, the number of steps tracked daily (12,767) was comparable to those who returned for a follow-up evaluation (12,834). So, it appears that employees who returned for follow-up were more motivated to track their activity, but no more active when they did so.

Finally, we acknowledge that the results observed for employees in a company of this size may not necessarily be representative of other companies in Canada. However, companies with over 200 employees produce approximately 50% of Canada's domestic production.[33] The study sample was also large enough to capture important changes in employee health metrics while providing a robust estimate of employee engagement and participation.

The first year of this study focused primarily on encouraging high program participation and increasing physical activity. Subsequent programming will continue to encourage physical activity but will also address weight loss and stress management. Ongoing follow-up will be required to evaluate the sustainability of the lifestyle changes. In addition, the financial costs and benefits associated with the program will be assessed to better understand clinical and economic impact of this program.

In conclusion, these first-year results demonstrate that an employee wellness program in a Canadian setting can indeed result in measurable benefits including the adoption of healthy lifestyle habits such as regular physical activity. This in turn can translate into measurable health benefits including the lowering of risk factors for CVD and diabetes, and improvements in mental health metrics such as stress and sleep quality. With many Canadian adults spending 6 to 9 hours each weekday at work, the workplace may provide a particularly effective setting for changing health habits. The short-term results of this program are promising and appear to have resulted in a healthier employee base and may provide important guidance for developing effective programs in other Canadian companies.

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