Twelve-month effects of Canada on the Move: a population-wide campaign to promote pedometer use and walking

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Abstract

Canada on the Move is a national campaign to promote pedometer use and walking among adult Canadians. The purpose of this paper is to investigate the initiative’s impact on sufficient walking, defined here as at least an hour daily in the week prior to the survey. Data were collected via the national Canadian Physical Activity Monitor’s rolling monthly sample throughout 2004. Population prevalence rates of walking were compared using Bonferroni-adjusted confidence intervals. Correlates of sufficient walking were estimated using odds ratios adjusted for age, sex, income and education. Message recall and pedometer ownership were associated with increased odds of self-reported walking. There was evidence of a campaign effect on walking behavior independent of secular trends. The increased likelihood of sufficient walking suggests an ongoing role for nationally funded public awareness campaigns. The effectiveness of health promotion to increase walking may be enhanced by combining motivational health-related messages with the dissemination and adoption of an easy-to-use tool for self-monitoring purposes.

Introduction

In recognition of the public health burden posed by modifiable risk factors for chronic disease, the World Health Organization developed a Global Strategy for Diet and Physical Activity in 2004 [1]. One element of the strategy was to recommend mass public education campaigns with the goal of motivating populations to undertake at least 30 min of moderate-intensity activity most days of the week, in line with minimal accepted public health recommendations in the United States [2] and Canada [3]. Walking is often promoted as a feasible way of reaching these recommendations among the inactive population as it represents a form of moderate activity that avoids many perceived barriers; it can be incorporated into different aspects of daily life, is low cost and requires little skill [4]. Recently, pedometers have been increasingly used to successfully increase walking [5] and track progress in meeting physical activity goals for health [6, 7].

In 2002, the Institute of Medicine (IOM) [8] reported that, although some health benefits could be achieved with at least 30 min of moderate intensity on a daily basis, this amount is insufficient to prevent weight gain. Instead, the IOM recommended 60 min of moderate-intensity daily activity (i.e. double the time previously endorsed by the US Surgeon General in 1996). Canada’s Physical Activity Guide [2] specifically indicates that 30–60 min of moderate effort activity is required to realize the full range of health benefits.

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In theory, public health recommendations could be achieved by as little as 30 min of moderate-intensity walking, but it is realistic that these 30 min should be taken over and above a basal level of activity that would include light walking. Hence, a reasonable goal might be 60 min as a minimal threshold of walking that would include both light and brisk walking.

Canada on the Move (COTM) was a 2004 initiative that linked research and promotion through a unique public–private partnership between the Canadian Institutes for Health Research (CIHR) and Kellogg Canada [9]. CIHR sparked the development of a web-based platform to collect walking- and pedometer-related data for use in subsequent observational and intervention projects [10]. Kellogg Canada promoted increased walking using pedometers through mass media advertisements (to ‘add 2000 steps’) with the concomitant mass distribution of pedometers via cereal boxes [11]. The specific COTM message to ‘donate your steps to health research’ was printed on these, directing consumers to the CIHR website.

The goals of COTM included increasing campaign and pedometer awareness as well as pedometer ownership and usage. Launched as an annual national physical activity survey in 1995 by the Canadian Fitness and Lifestyle Research Institute (CFLRI), the Physical Activity Monitor’s (PAM) monthly rollout offered a unique existing mechanism to evaluate the impact of COTM upon the Canadian general population. Baseline data for COTM-related questions were gathered during November and December 2003 and were then tracked post-launch throughout 2004. A detailed chronology of the campaign timing and the coinciding PAM rollout is documented elsewhere [12].

COTM was successful in that it raised awareness of the campaign messages, that pedometer ownership increased and that awareness of the campaign messages was associated with pedometer use [12]. These are the proximal effects of the campaign, and although important to identify initial campaign impact, are only fully verified once the more distal impacts are considered. Therefore, this study examines the population-wide effects of COTM on these distal impacts of physical activity behaviors. Specifically, we set out to determine whether the targeted public health outcome of increasing walking was associated with pedometer ownership and awareness of the campaign (i.e. the previously established proximal effects) and whether this was independent of secular trends in walking in Canadian adults.

**Methods**

**Study design**

A monthly rolling sample totaling 9935 adults 18 years and older was selected from the CFLRI’s PAM with probability roughly proportional to the size of the population of Canada’s provinces and territories. An eligible household member was selected using random digit dialing and the closest birth-date method. Telephone interviews were conducted by the Institute for Social Research following procedures approved by the Ethics Review Board of York University. Detailed methods of the PAM related to the COTM initiative are already described [12].

**Measures**

Respondents were asked if they had heard of the campaign brand COTM, the generic message ‘add 2000 steps’ and the specific COTM tagline ‘donate your steps to health research’ in the previous month (yes versus no/do not know). They were also asked ‘Have you ever heard of a pedometer or step counter?’ (yes, no, do not know) and those who positively indicated awareness were asked if they owned one (yes, no). The generic short form International Physical Activity Questionnaire (IPAQ) [13] asks about walking, moderate and vigorous physical activity in the past 7 days across all domains (work, leisure, chores and transport). As COTM was designed to encourage walking, only the questions about the number of days in the previous week that the respondent walked for at least 10 min at a time and if walking was reported, the total time spent walking per day were examined.
Analysis

Given that the IPAQ questions ask activity level summed across work, chores, transport and leisure-time activities rather than a single domain, sufficient walking was defined as walking at least an hour daily (regardless of purpose) in the week prior to the survey. Sufficient walking was then dichotomized as yes/no. Differences in prevalence rates of sufficient walking were estimated by weighting responses to the population and tested using Bonferroni-adjusted 95% confidence intervals (CIs). The relationship of the campaign brand, generic message, specific tagline and pedometer ownership to sufficient walking was assessed using odds ratios (i.e. comparing sufficient versus insufficient walking) adjusted for age, sex, income and education (secondary, college diploma or certificate, university degree) calculated using forced entry logistic regression models in SPSS version 12. The potential influence of secular trends in sufficient walking relative to campaign effects was examined by comparing the adjusted odds ratios of sufficient walking by quarter (January–March, April–June, July–August, September–December) in 2004 for those aware and unaware of the campaign against those observed by quarter in 2003.

Results

In 2004, 30.7% (95% CI 29.0–32.4%) of Canadian adults reported sufficient walking (i.e. for at least 1 hour daily in the week prior to the survey). The prevalence of sufficient walking was lower among women and low-income earners and decreased by age and education (see Fig. 1).

Table I summarizes the relationships between sufficient walking and the COTM messages and pedometer ownership. There was 2.4 and 2.3% higher prevalence of sufficient walking among those recognizing the campaign brand COTM (32.4% aware, 30.0% unaware; 2.4% difference, 95% CI 1.9–2.9%) and its general message add 2000 steps (32.8% aware, 30.5% unaware; 2.3% difference, 95% CI 1.8–2.8%) compared with those who were not aware of them. Awareness of COTM was associated with 13% higher odds of sufficient walking after adjusting for age, sex, income and education. The prevalence of sufficient walking among those recognizing the tagline donate your steps to health research was higher than that among those aware of COTM and add 2000 steps (35.7% versus 30.0–30.1%, absolute difference 5.6%, 95% CI 4.7–6.5%) and was associated with 23%
higher adjusted odds of sufficient walking compared with those who did not recognize that specific tagline. Sufficient walking was also associated with pedometer ownership. Those owning a pedometer were 14% more likely than those not owning one to engage in sufficient walking, which translated into a small increase in the overall prevalence of sufficient walking among this group (absolute difference 1.7%, 95% CI 1.4–2.0%).

Being aware of the specific COTM tagline donate your steps to health research and owning a pedometer had an additive impact on the odds of sufficient walking; those reporting this combination were 1.52 times more likely to report sufficient walking than those who did not meet this condition. This was associated with a significantly higher prevalence of sufficient walking (absolute difference 9.2%, 95% CI 8.6–9.8%) between these two groups. The adjusted odds of owning a pedometer, but not recognizing the ‘donate your steps’ tagline remained unchanged at 1.12 in the combined model compared with the independent model, as did the odds of recognizing the tagline, but not owning a pedometer (Adjusted odds ratios = 1.21).

There was a discernable seasonal pattern of sufficient walking among Canadian adults. In 2003, the likelihood of sufficient walking in the April–June (second quarter or Q2) and July–September (Q3) was higher than in January–March (Q1, referent) and October–December (Q4) (Fig. 2). The same seasonal pattern was observed in 2004 among those unaware of COTM, in that the adjusted odds of sufficient walking in Q1 2004 were equivalent to those of Q4 of 2003 and the same seasonal increases were observed in Q2 and Q3 of 2004 as in 2003. This indicated that there was no difference in the secular trend for walking between 2003 and 2004 among those unaware of COTM. By contrast, the adjusted odds ratio of sufficient walking in Q1 2004 was 4.6 times higher among those recognizing the tagline and owning a pedometer than in Q1 2003. These adjusted odds were also significantly higher than among those unaware of COTM. In Q2 of 2004, the odds of

| Table I. The relationship of COTM and pedometer ownership to walking an hour daily |
|----------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                                                                                   | **n** | **Walking % (2004)** | **Adjusted odds ratios** | **Lower (95% CI)** | **Upper (95% CI)** |
| **Overall Adults 18 and older**                                                                                   |       |                   |                       |                 |                 |
| **Message awareness**                                                                                               |       |                   |                       |                 |                 |
| COTMa                                                                                                               |       |                   |                       |                 |                 |
| Not aware                                                                                                            | 6710  | 30.0              | Reference             |                 |                 |
| Aware                                                                                                                | 3045  | 32.4              | 1.13                  | 1.03            | 1.24            |
| Generic, add 2000 stepsa                                                                                             |       |                   |                       |                 |                 |
| Not aware                                                                                                            | 8600  | 30.5              | Reference             |                 |                 |
| Aware                                                                                                                | 1155  | 32.8              | 1.12                  | 0.98            | 1.28            |
| Specific, donate your steps to health researcha                                                                     |       |                   |                       |                 |                 |
| Not aware                                                                                                            | 8685  | 30.1              | Reference             |                 |                 |
| Aware                                                                                                                | 1070  | 35.7              | 1.23                  | 1.07            | 1.41            |
| **Pedometer ownershipa**                                                                                             |       |                   |                       |                 |                 |
| No                                                                                                                   | 8249  | 30.2              | Reference             |                 |                 |
| Yes                                                                                                                  | 1506  | 31.9              | 1.14                  | 1.01            | 1.30            |
| Donate your steps to health research plus pedometera                                                                  |       |                   |                       |                 |                 |
| Not aware, no pedometer                                                                                                | 7319  | 30.0              | Reference             |                 |                 |
| Not aware, own pedometer                                                                                                | 1366  | 31.0              | 1.12                  | 0.98            | 1.27            |
| Aware of donate steps, no pedometer                                                                                   | 930   | 35.2              | 1.21                  | 1.04            | 1.40            |
| Aware of donate steps and own a pedometer                                                                             | 140   | 39.2              | 1.52                  | 1.09            | 2.12            |

*aAdjusted for age, sex, income and education.*
sufficient walking (adjusted for age, sex, income and education) among pedometer owners aware of the tagline decreased and no longer differed neither from Q1 2003 nor from those who had not heard of COTM. However, subsequent to the second phase of the campaign in June 2004, the adjusted odds increased to 2.3 in Q3 and 3.5 in Q4 of 2004. As a result, whereas there was no difference in the seasonal patterns of sufficient walking between those unaware of the campaign in 2004 and that of 2003, a change was observed in the seasonal pattern of sufficient walking among those who owned a pedometer and were aware of the specific campaign tagline. By Q4 2004, higher adjusted odds of sufficient walking were observed among pedometer owners who were aware of the specific tagline compared with all quarters (Q1–Q4) in 2003 and among those unaware of the campaign in all quarters of 2004.

**Discussion**

The hierarchy of effects model often used in creating communication campaigns [14] proposes a series of intervening causal variables from messaging to behavior change: exposure → awareness → knowledge → attention → intention → behavior change. As previously reported, COTM was successful in that it created awareness of its brand name and the message add 2000 steps, and captured the ‘attention’ of Canadians through its unique campaign tagline donate your steps to health research [12]. Furthermore, other proximal impacts were observed; specifically, COTM was associated with pedometer ownership and with pedometer usage in the week prior to the survey. These represent proximal impacts, namely, raising awareness and salience by which the success of a campaign can realistically and immediately be judged [15]. Here, we extend this more typical approach to campaign evaluation to demonstrate a distal, behavioral impact for COTM that was also linked to these earlier campaign effects. A year after its launch, awareness of COTM was associated with a 13% increase in the likelihood of sufficient walking, adjusting for age, sex, income and education. Achievement of such a public health goal might only realistically be observed through ongoing surveillance of continuous longer term campaigns [15].

![Adjusted odds ratios of walking an hour per day (2003–04) in relation to COTM.](image-url)
Documented impacts of mass public education campaigns on physical activity are rare. Short-term effects have been linked to focused mass media campaigns in Australia and New Zealand [16–18], but not elsewhere [19]. The lack of behavioral impacts in previous public health-oriented campaigns may be due in part to the difficulty of measuring behavioral outcomes and subsequently attributing these changes to campaign timing. Another limitation may be insufficient funding to generate enough community awareness of an issue. In Canada, the monthly PAM surveillance system enabled us to assess walking behavior in relation to specific campaign timing. Strategies to influence population levels of physical activity require such systematic mechanisms to realistically evaluate the impact of changing policies and practice in addition to planned broad-based interventions.

Historically, leisure-time physical activity has increased in Canada and walking continues to be the most prevalent activity reported by Canadians [20]. One could therefore surmise that the increase in walking observed over the year was simply a reflection of these more secular trends. However, disentangling the odds of sufficient walking by quarter between those owning pedometers and aware of the unique campaign tagline (donate your steps to health research) compared with those not aware of the campaign has allowed us to observe that (i) there was no change in the level of sufficient walking between 2003 and 2004 among those who had not heard of COTM, (ii) COTM was associated with increased odds of sufficient walking among those aware of the campaign in a pattern consistent with the campaign timing, (iii) the odds of sufficient walking at the end of the campaign period among those aware of the unique campaign tagline and owning a pedometer were substantially higher than those observed among adults unaware of the campaign during the peak walking seasons of Q2 and Q3. Collectively, these observations allow us to conclude that COTM has had a real impact on walking behavior among Canadians who were aware of the campaign.

Recall of the specific tagline donate your steps to health research appears to have resonated with Canadians, appealing perhaps to their concerns either with the overall health of the nation or with the altruistic aspect of the message. It also represents the opportunity for participating in an immediate and reinforcing behavior, that is, the process of self-monitoring and logging one’s own behavior. Increasing pedometer ownership through the distribution campaign (e.g. through cereal box distribution) may also have been a uniquely successful element, as ownership was associated with a 12% increase in the likelihood of sufficient walking. Interventions designed to encourage participants to monitor their walking have shown improvement in a number of important health outcomes (e.g. weight, waist girth, blood pressure) with increases as little as ~2500 steps day \(^{-1}\) over baseline [21, 22] and up to an increment of 4300 steps day \(^{-1}\) [23]. Monitoring devices, in this case pedometers, can be used to motivate people to walk and to assist in setting and monitoring the achievement of personally set goals [7, 24]. In the mass education campaign described here, linking an objective monitoring device with the health-related message and tagline appears to have been effective in further increasing the likelihood of sufficient walking and suggests that combining an easy-to-use tool for self-regulation of the target behavior with relevant messaging may result in a larger campaign effect than either just the message or distribution of the tool alone.

The limitations of this study include lack of information on usage patterns and reasons for owning a pedometer (such as for motivation or self-monitoring) and the reliance on self-reported behaviors that are associated with a number of well-known weaknesses including recall and social desirability biases. However, the IPAQ questions used to assess sufficient walking have acceptable measurement properties and are recommended for international monitoring of population levels of physical activity [13]. Further, the size and representativeness of the PAM rollout contribute to its impressive sensitivity evidenced by the opportunity to tease out targeted campaign affects related to its timing. Although the overall impact in walking rates across the 12-month period of the campaign on population levels of sufficient walking in 2004
might appear small at first glance (30.7% overall compared with 30.0% among those unaware), it must be remembered that the campaign occurred in two waves during the year with an increase in proximal impacts observed in February and again in July [12]. In particular, recall of donate your steps increased from 4.5% at baseline to 14.5 and 14.7%, respectively, after the two campaigns with declines in recall observed between the two waves of the campaign. At baseline, 1.5% of adults had bought a pedometer and none had obtained one via the campaign. After the first wave, 4.3% had bought a pedometer and the rate remained at that level after the second wave. In contrast, obtaining a pedometer from a cereal box increased to 3.2% after the first and then to 7.4% at the end of the second wave in July. By year-end, 2 750 000 adults (11%) heard and recalled the specific donate your steps message. Among these individuals, the increased prevalence of walking during the fourth quarter (October–December) translates into a 26.5% increase in the number of sufficient walkers attributable to the campaign and would have been expected. Nonetheless, this impact was restricted to only those Canadians aware of the message, so society as a whole did not walk more. This result compares favorably with campaign effect sizes observed previously in tobacco campaigns in the United States, which ranged from an absolute decrease of 1.3% in smoking rates over a 1-year period in Michigan to a 2.7% decrease over successive 3-year periods in California [25].

In summary, the more distal impact of increased sufficient walking among adult Canadians associated with the previously established proximal effects [12] supports the role for ongoing well-resourced and coordinated mass public education campaigns. It is logical to conclude that the COTM initiative contributed to improvements in physical activity-related health status among adult Canadians that extended beyond the actual campaign time lines. The effectiveness of campaigns to specifically change walking behavior may be improved by combining motivational and explicit health-related messages with a user-friendly and affordable tool for self-monitoring purposes. Repeated and lasting population effects may require the public health commitment to resource continuous message delivery, supported by ancillary services and programs.

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Conflict of interest statement

None declared.

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