

Research Letter

Pedometers As a Means to Increase Walking and Achieve Weight Loss

To the Editor: There is ample evidence proving the benefits of exercise,¹ but limited data on ways to motivate sedentary individuals to achieve sustained increases in physical activity. Pedometers have been used to measure physical activity levels and investigated as a means of increasing physical activity. Studies have found that pedometer use increased average daily steps taken by employees over an 8-week period^{2,3} and increased short walking trips by family medicine patients over a 9-week period.⁴ We performed a pilot study to examine whether pedometer use would lead to sustained (6-month) increases in physical activity in patients seeking usual care in a family medicine setting.

We chose a sedentary, overweight, and obese adult population as a group that would benefit from increasing physical activity. The goal was to determine whether an easy-to-implement intervention, encouraging participants to record daily steps taken, as measured by a pedometer, could motivate a significant long-term increase in physical activity levels. Body mass index (BMI) was also tracked to see whether this intervention would result in weight loss.

Study Design

The study took place at the Scottsdale Healthcare Family Practice Center (training site for the Scottsdale Healthcare Family Medicine residency program). Patients aged 18 to 69 with BMI measurements of 25 or greater were identified as potential participants. Pregnant women and non-English speaking patients were excluded. Potential participants who reported baseline physical activity of less than 1 hour per week were considered sedentary and invited to participate in the study. Thirty-nine patients were recruited and randomly assigned to 2 groups using a computer-generated randomization table. Both groups received handouts promoting exercise, advice to increase walking to improve health and help control weight, and instructions to return in 3 and 6 months for follow-up. Participants were phoned up to 3 times each to remind them to schedule follow-up visits. A self-reported physical activity questionnaire was completed, and BMI was calculated at baseline and follow-up visits. The intervention group also received a pedometer (Sportline 330 model), monthly logbook, and instructions to record the number of steps taken each day for 6 months. Pedometer users were asked to work up to a daily goal of either 10,000 steps or twice their baseline steps.

Findings

The pedometer ($n = 23$) and control ($n = 16$) groups were similar in terms of age, gender, BMI, and baseline activity level. Thirty-five participants (90%) returned for

at least one follow-up visit and were included in the final analysis. Of the pedometer group, 14 of 23 participants (61%) returned step-count logs. The 14 logs contained an average of 5.1 months of recorded steps, and 90% of the days during those months had step counts recorded. The mean step count during the study was 6100 per day.

Table 1 summarizes the physical activity questionnaire data. Among the pedometer group, the percentage of participants who reported walking for exercise increased from 39% at the first visit to 79% at the final visit. Among the control group, the percentage of participants who reported walking for exercise increased from 50% at the first visit to 62% at the final visit. Although there was no statistical difference between the 2 groups, the percentage of people in the pedometer group who reported walking for exercise doubled during the study.

At baseline, one quarter of all study participants reported walking for exercise during the prior week. At the final visit, significantly more of the pedometer group (70%) reported walking for exercise during the past week compared with the control group (33%, $P = .04$). When asked how many days participants walked for exercise during the past week, both groups averaged approximately one half day per week at the initial visit. At the final visit, the control group reported an increase of 1 day per week on average (up to 1.4 days per person per week), and the pedometer group had increased by 2 days per week (up to 2.6 days per person per week).

Table 2 lists the average BMI for participants at baseline, at the second visit for all participants, and at the final visit for all participants. On average, participants had no significant weight loss or weight gain during the study.

Conclusions

A main goal of this study was to determine the feasibility of introducing pedometers as an intervention for increasing physical activity during typical family physician office visits. The study duration time of 6 months was chosen to find whether pedometer use could provide sustained benefit beyond the initial period of novelty, and because routine follow-up for chronic conditions often takes place at 3- to 6-month intervals. In the pedometer group, patient acceptance was high, office interruption was minimal, and a majority of patients completed step-count logs for multiple months.

Participants in both groups reported an increase in physical activity during the study, but a significantly higher percentage of the pedometer group (70%) reported walking for exercise at the final visit compared with the control group (33%). Among the pedometer group, twice as many reported walking for exercise at the end compared with the start of the study. Previous studies in which pedometer use had a positive impact on physical activity were 8- to 9-week trials.²⁻⁴ It is encour-

Table 1. Physical Activity Questionnaire Results at Baseline and Final Visit

	Pedometer Group (%)	Control Group (%)	P Value*
Physically active 1 or more hours per week:			
Baseline visit	1/23 (4)	0/16 (0)	1.00
Final visit	11/19 (58)	7/13 (54)	1.00
Walk for exercise			
Baseline visit	9/23 (39)	8/16 (50)	.53
Final visit	15/19 (79)	8/13 (62)	.43
Walked for exercise the past week			
Baseline visit	6/23 (26)	4/16 (25)	1.00
Final visit	14/20 (70)	5/15 (33)	.04
Days walked during past week			
Baseline visit (days/person)	0.6	0.5	.47
Final visit (days/person)	2.6	1.4	.13

* Discrete variables compared using Fisher's exact test with 2-sided *P* values, days walked compared using *t* test for equality of means.

Table 2. Average Body Mass Index (BMI) at Baseline, Second, and Final Visit

	Pedometer Group (n = 20) Mean BMI ± SD	Control Group (n = 15) Mean BMI ± SD	P Value
Baseline visit	37.8 ± 8.7	39.5 ± 9.3	.59
Second visit	37.2 ± 7.5	39.2 ± 9.2	.44
Final visit	37.8 ± 9.2	39.1 ± 9.2	.26

aging to see positive results in a 6-month trial of pedometer usage. Unfortunately, neither the control group nor the pedometer group lost weight during the course of the study. Studies of people who successfully lose weight find that very few do so through exercise alone.⁵

In a family medicine setting, pedometer use is easy to implement and well accepted among sedentary, overweight, and obese patients. Regular use of a pedometer seems to increase physical activity in this population for up to 6 months. An economical and widely available intervention, pedometers warrant further research as a tool to improve the health of sedentary people.

We acknowledge Elizabeth Bongiovanni, research assistant, for patient recruitment, tracking, and data collection. Pedometers were donated by Scottsdale Healthcare Community Health Education Program.

Rebecca Dicken-Kano, MD
Marvin Moe Bell, MD, MPH
Scottsdale Healthcare Family Medicine Residency
Scottsdale, AZ

References

1. U.S. Department of Health and Human Services. Physical Activity and Health: A Report of the Surgeon General. Atlanta (GA): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion; 1996.
2. Croteau KA. A preliminary study on the impact of a pedometer-based intervention on daily steps. *Am J Health Promot* 2004;18:217–20.
3. Rooney B, Smalley K, Larson J, Havens S. Is knowing enough? Increasing physical activity by wearing a pedometer. *WMJ* 2003;102:31–6.
4. Stovitz SD, VanWormer JJ, Center BA, Bremer KL. Pedometers as a means to increase ambulatory activity for patients seen at a family medicine clinic. *J Am Board Fam Pract* 2005;18:335–43.
5. Klem ML, Wing RR, McGuire MT, Seagle HM, Hill JO. A descriptive study of individuals successful at long-term maintenance of substantial weight loss. *Am J Clin Nutr* 1997;66:239–46.