Effect of Community Volunteering on Physical Activity
A Randomized Controlled Trial

Vijay R. Varma, PhD, MPH,[1,2] Erwin J. Tan, MD,[3] Alden L. Gross, PhD,[1,4] Greg Harris, BA,[1,2] William Romani, PhD,[5] Linda P. Fried, MD,[6] George W. Rebok, PhD,[1,2] Michelle C. Carlson, PhD[1,2]

Introduction: Older adults with a high number of chronic conditions and who live in environments that do not promote physical activity have great difficulty initiating and adhering to exercise programs. Novel lifestyle activity interventions that can effectively increase physical activity may address disparities in health in these populations. This study evaluates the effects of the Baltimore Experience Corps program, a community-based volunteer program, on walking activity in older adults.

Methods: The Baltimore Experience Corps Trial is a sex-stratified RCT that recruited participants from 2006 to 2009. Older adult participants aged ≥ 60 years ($n=123$) were from a nested objective physical activity trial within the larger Baltimore Experience Corps Trial. Participants randomized to the intervention group were placed as volunteers within the Baltimore public school system for 2 years. The primary study outcome was objectively measured total amount of walking activity measured in steps/day. Differences between intervention and control groups were measured at 12 and 24 months using linear mixed effects models. Data were analyzed in 2014.

Results: At 24 months, women, but not men, in the intervention group showed an increased amount of walking activity, averaging 1,500.3 (95% CI=77.6, 2,922.9) greater steps/day compared with the control group. Women in the control group showed a decline of 1,191.6 (95% CI=−2243.7, −139.5) steps/day at 24 months compared to baseline.

Conclusions: A community-based volunteer intervention increased walking activity among older women, who were at elevated risk for both inactivity and adverse health outcomes.

Trial registration: This study is registered at www.clinicaltrials.gov NCT00380562.
(Am J Prev Med 2016;50(1):106–110) © 2016 American Journal of Preventive Medicine

Introduction

Physical activity is associated with a lower risk of adverse health outcomes[1–5]; however, only 20% of older adults meet U.S. physical activity guidelines.[6–8] This is particularly concerning for low-SES older adults who, compared with high-SES individuals, have lower baseline levels of physical activity and access to fewer physical activity–related facilities owing to restrictive neighborhood characteristics.[7,9–12]

Experience Corps (EC), a community-based health promotion model, represents a novel approach to physical activity interventions. EC places older adults as volunteers within the public school system to simultaneously increase their physical, cognitive, and social activity, while improving the academic outcomes of children.[13,14] EC was designed specifically to attract a diverse population of older adults who may not engage in typical exercise and other health promotion interventions.[13,15]

Here, we report on the effectiveness of the long-term, 2-year EC intervention within the Brain Health Study (BHS), a substudy within the Baltimore EC Trial (BECT), to increase walking activity in an older cohort at elevated

From the ¹Johns Hopkins Center on Aging and Health, Baltimore, Maryland; ²Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland; ³The Corporation for National and Community Service, Washington, District of Columbia; ⁴Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland; ⁵AARP, Inc., Washington, District of Columbia; and ⁶Mailman School of Public Health, Columbia University, New York, New York

Address correspondence to: Vijay R. Varma, PhD, MPH, Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, Hampton House 8th floor, 624 N. Broadway St., Baltimore MD 21205. E-mail: vvarma1@jhu.edu.

risk for cognitive and functional decline. We explored whether BHS participants randomized to the intervention, compared with controls, showed increased daily walking activity.

Methods

Participants

Participants were from the BHS,[16] a nested objective physical activity and neuroimaging trial within the larger BECT, a sex-stratified, randomized controlled effectiveness trial to evaluate whether the intervention reduced mobility disability among older adults.[17] Details on sex-stratified randomization, study design, sampling methodology, recruitment, and enrollment criteria are described elsewhere.[16,17]

From 2006 to 2009, a total of 702 participants were randomized to either EC or the low-activity control. Of those, 123 were also simultaneously enrolled in the BHS (Figure 1). Rationale for sample size has been described previously.[17] The final sample in this study included 114 participants; reasons for exclusion are described in Figure 1. The study protocol was approved by the Johns Hopkins IRB, and each participant provided written informed consent.

Study Design

Participants randomized to the intervention group were placed as volunteers in Baltimore City public elementary schools for 2 academic years.[13,17] Details of the intervention as well as the low-intensity control conditions have been described previously.[17]

The BHS was designed to measure the effect of the intervention on levels and patterns of walking activity occurring outside the intervention. This was in response to evidence suggesting that physical activity often declines after interventions cease,[18] and recommendations to measure and better understand how daily civic engagement may impact the maintenance of physical activity.[19] By design, the majority of participants were evaluated in the summer and early fall (prior to the academic year) in order to capture daily walking activity outside the intervention and to reduce seasonal bias.

Walking Activity Measure

Walking activity was measured using a Step Activity Monitor (SAM) at baseline and follow-up visits at 12 and 24 months. The SAM is an accelerometer that has been validated across a range of community-dwelling older adult populations with varying levels of function.[20–22]

Participants were instructed to wear the SAM for up to 7 days while keeping a wear time/activity diary at approximately 1-hour intervals. The data cleaning protocol has been described previously.[23]

The main outcome measure was daily walking activity, measured by the number of steps walked/day averaged across all valid surveyed days.

Statistical Analysis

All analytic methods considered initial treatment assignment, rather than treatment compliance, to evaluate the effect of the intervention; individuals who did not provide SAM data were excluded (Figure 1). All analyses were sex stratified a priori; the BHS was designed specifically to explore sex differences in intervention effects.[24] Linear mixed-effect models to account for subject-level clustering with random intercepts were adjusted for age at baseline and race. We additionally adjusted for BMI in women because of significant differences between baseline characteristics of study subjects (Appendix Table 1, available online). Data were analyzed in 2014.

We estimated the following at 12 and 24 months: (1) intervention effect, intervention minus control group; and (2) change in walking activity relative to baseline for the intervention and
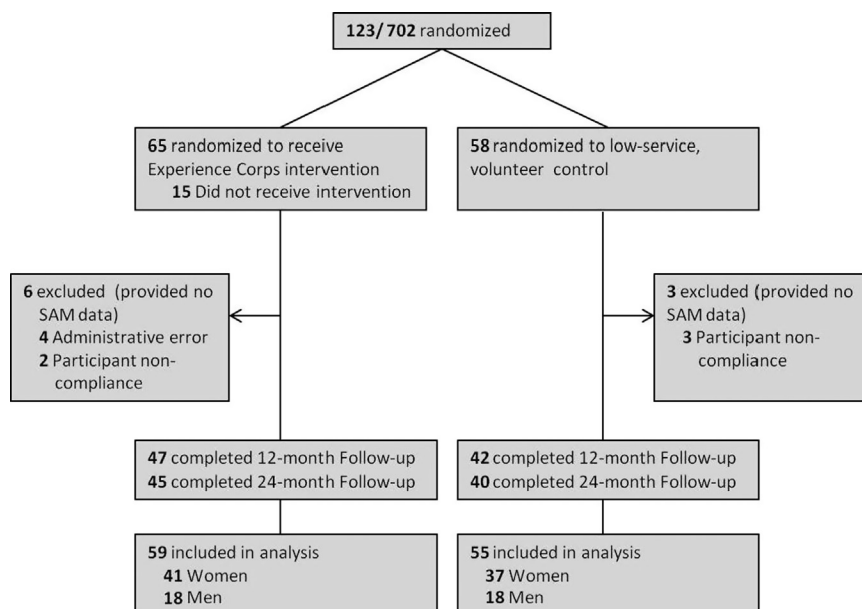
Figure 1. CONSORT diagram summarizing flow of participants through the Brain Health Study.