



Applying the ecological model of behavior change to a physical activity trial in retirement communities: Description of the study protocol

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ABSTRACT

Objectives: To describe the intervention protocol for the first multilevel ecological intervention for physical activity in retirement communities that addresses individual, interpersonal and community influences on behavior change.

Design: A cluster randomized controlled trial design was employed with two study arms: a physical activity intervention and an attention control successful aging condition.

Setting: Sixteen continuing care retirement communities in San Diego County.

Participants: Three hundred twenty older adults, aged 65 years and older, are being recruited to participate in the trial. In addition, peer leaders are being recruited to lead some study activities, especially to sustain the intervention after study activities ceased.

Intervention: Participants in the physical activity trial receive individual, interpersonal and community intervention components. The individual level components include pedometers, goal setting and individual phone counseling. The interpersonal level components include group education sessions and peer-led activities. The community level components include resource audits and enumeration, tailored walking maps, and community improvement projects. The successful aging group receives individual and group attention about successful aging topics.

Measurements: The main outcome is light to moderate physical activity, measured objectively by accelerometry. Other objective outcomes included physical functioning, blood pressure, physical fitness, and cognitive functioning. Self report measures include depressive symptoms and health related quality of life.

Results: The intervention is being delivered successfully in the communities and compliance rates are high.

Conclusion: Ecological Models call for interventions that address multiple levels of the model. Previous studies have not included components at each level and retirement communities provide a model environment to demonstrate how to implement such an intervention.

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1. Introduction

The importance of environmental factors in older adults' health and functioning is emphasized in environmental gerontology theories (e.g., Lawton's person environment fit model; [1]) and in the international classification of functioning,

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disability and health [2]. More specifically, numerous cross-sectional studies have demonstrated the influence of built environmental attributes on physical activity (PA) in older adults [3,4]. Various reports from authoritative groups including the World Health Organization [5], the Environment Protection Agency's Aging Initiative [6], and the American Association of Retired Persons [7] have highlighted the particular need for community design changes to support seniors' walking.

Although expensive, built environmental changes can benefit large population groups over longer timeframes [8]. Yet, environmental facilitators alone will not increase healthy behaviors across the population. As suggested by the Ecological Model of behavior change, attention must be given to the multiple levels of individual, interpersonal, community, and policy factors, and their interactions, in order to influence change [9]. In other words, the old adage "if you build it they will come" seldom holds true for health behaviors without awareness, personal motivation, and appropriate behavior change skills implemented alongside environmental change. An Ecological approach addresses both individual and interpersonal skills and motivations, and further ensures a supportive social and community environment. Indeed, this combination of psychosocial and built environmental factors is significantly related to seniors' PA [10].

Older adults are the least physically active segment of society, with recent objective monitoring indicating only 2.5% of adults over age 60 meet PA recommendations with levels decreasing with each decade after the age of 60 [11]. Moreover, seniors spend the most amount of time sitting: over 8 h daily [12]. This is of concern given the substantive evidence showing that PA is related to reduced morbidity and mortality [13,14], and is essential in the prevention and treatment of obesity, type 2 diabetes, cardiovascular disease, and osteoporosis, as well as for improving postural stability and reducing falls risk [15–17]. Additionally, evidence has emerged that prolonged sitting has an impact on gene expression and molecular and metabolic processes involved in the etiology of obesity, type 2 diabetes, and coronary artery disease that is independent of moderate-to-vigorous intensity PA [18,19]. Overall, this highlights the urgent need for interventions to increase the amount of physical movement by seniors.

Due to their complexity, multilevel Ecological interventions are scarce. However, for encouraging older adults to be physically active and less sedentary, retirement communities provide an ideal, small-scale, self-contained environment in which interventions based on the Ecological Model of behavior change can be tested. The nature of the setting allows for multiple levels to be influenced. Thus, designing and testing an ecological intervention within retirement communities can inform the development of larger, neighborhood-wide ecological interventions. This paper describes intervention protocol for the Multilevel Intervention for Physical Activity in Retirement Communities (MIPARC) – the first study to simultaneously address all levels of the Ecological Model of behavior change to improve PA in older adults. The purpose of the paper is to describe MIPARC's ecological intervention and evaluation, and to demonstrate a real world application of the Ecological Model that other researchers can replicate and adapt to neighborhood settings, environments, and other age groups.

2. Methods

2.1. Overview and study design

MIPARC is a group randomized controlled trial assessing the effectiveness of a 12 month multilevel intervention for improving PA in Continuing Care Retirement Community (CCRC) residents. The Ecological Model provided the framework for the multilevel intervention design. Moreover, social cognitive theory guided the intervention's use of specific behavior change strategies, while principals of organizational change theory and community mobilization informed the policy components [19–22]. In summary, the intervention includes individual components (pedometer-based self-monitoring, educational materials, and tailored bi-weekly counseling calls); interpersonal components (bi-weekly group sessions and peer mentoring); environmental components (walking signage prompts, tailored community walking maps, posted step counts of different corridors and classes); and policy components (improvement of onsite activity opportunities and walking environments through peer led advocacy). Up to sixteen retirement community sites in San Diego County are being randomized to the intervention or control condition using an Efron-type procedure [23]. Ethical approval for the study was obtained from the University of California, San Diego (#091028).

2.2. Recruitment and eligibility criteria

2.2.1. Sites

Contact information and mailing addresses for CCRC facilities in San Diego County were identified from county Elder Care resources. Sites with over 100 residents, independent living accommodations, and a park or shops within walking distance (1 mile) were eligible to participate. Twenty sites met these criteria, all were contacted but two sites refused to participate, one discontinued contact due to staffing pressures, and two sites were not able to recruit more than 10 participants. A total of 7 sites have been recruited to date (May 2012). Site managers and activity directors were given information about the study and a memorandum of understanding was signed before randomization. New sites are brought on every 6 months with at least 2 sites running in any one sixth month period.

2.2.2. Peer leaders

In each site, 2–5 peer leaders aged 65 or above are selected to help deliver the program. Potential peers are identified from staff and resident recommendations, flyers and personalized letters. We ask staff to identify residents who are leaders in their community, engaged in the programs offered at the site, and, in at the PA sites only, a good role model for physical activity. Applicants are interviewed and screened for their availability and commitment to the program. The interview includes several questions including: any past leadership experience, ideas to engage residents in programming, their comfort level in contacting other residents during the study, and (in PA sites) the physical activities they enjoy. Peers are given a \$600 personal honorarium for the 12 month study period in the intervention sites, \$300 in the control sites. Payments are made in installments upon completion of the peer training, 6 month measures, and 12 month measures.

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