

A Physical Activity Program to Mobilize Older People: A Practical and Sustainable Approach

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Purpose: Despite the documented benefits of physical activity, it remains difficult to motivate older adults to start and maintain regular physical activity. This study tested an innovative intervention for mobilizing older adults into a neighborhood-based walking program. **Design and Methods:** Researchers recruited a total of 260 healthy but insufficiently active adults aged 65 to 74 years and randomly selected from the Australian electoral roll from 30 Perth metropolitan neighborhoods. Social cognitive theory guided the design of the program. Researchers collected both qualitative and quantitative data to inform the development, together with ongoing process evaluation. **Results:** A total of 65% of participants completed the program. Their mean weekly walking time for recreation increased by about 100 min, and 80% of participants reported that they would continue to walk twice per week upon program completion. **Implications:** This practical program is potentially effective and sustainable with respect to mobilizing physically inactive older people.

Key Words: Exercise promotion, Program planning, Community-based intervention, Social, Behavioral

Western societies are attracted to the luxuries of a modern lifestyle that facilitates inactivity, especially in the older age groups (DiPietro, 2001). The World Health Organization (Matsudo et al., 2004) estimated that the prevalence of insufficient physical activity (less than 2.5 hr per week of moderate activity) ranges from 31% to 51%, with other reports of up to 80%. In the United States, Healthy People 2010 (U.S. Department of Health and Human Services, 2000) indicated that 51% of adults older than 65 years are inactive. These figures are similar in Australia, where 46% of adults aged 60 to 75 years are inactive and about one third of these are completely sedentary (Bauman, Bellew, Vita, Brown, & Owen, 2002). Only 40% of people in this age group indicate they have “any intention to be more physically active” (Bauman et al., 2002 p 26).

Physical activity for people older than 65 years is a recognized public health strategy (Bauman et al., 2002), as the evidence clearly demonstrates the risk reduction of all-cause mortality in those achieving recommended levels of at least moderate-intensity physical activity (Anderson, Schnohr, Schroll, & Hein, 2000; Crespo et al., 2002; Lee & Skerrett, 2001; Wannamethee, Shaper, & Walker, 2000). An estimated half of all physical decline associated with age is preventable if adequate levels of physical activity are maintained (O’Brien Cousins, 2003).

Some have suggested that the design of the intervention is one of the most influential factors affecting participation in physical activity programs (Mills et al., 2001). A review of eight general physical activity intervention programs by Cyarto, Moorhead, and Brown (2004) found that the program designs ranged from broad-based community promotion to one-on-one counseling with a health practitioner. These interventions were based in the United States,

Australia, and Europe and had varying sample sizes (20–700). The majority used self-reporting measures, were conducted in a supervised setting, and incorporated specialized equipment. The researchers found that interventions that were more tailored and aimed to reduce barriers to physical activity were likely to be more successful. However, most of the positive results occurred with volunteer participants recruited through advertising (Baranowski, Anderson, & Carmack, 1998). Baranowski and colleagues also found greater success with volunteers after reviewing 25 physical activity interventions.

A more recent focus has been on the influence of the physical environment on activity levels. A review by Humpel and colleagues (2004) found that access to facilities—such as a local park, safe walking paths, and a local attractive area—was important for physical activity. Giles-Corti and Donovan (2003) also reported the positive influence of facility access on physical activity but concluded that the individual and the social environment outweigh the influence of the physical environment on achieving recommended levels of physical activity.

The design of a physical activity intervention needs to consider the individual and how he or she interacts with the social environment (Spence & Lee, 2003). Participants need to understand the program (Souder, 1992), and program organizers need to understand the participants' commitment. The frequency, intensity, and duration of the program must be suitable for the program participants. The friendliness of the instructor and consistency of instruction are purportedly of exceptional importance (Warren-Findlow, Prohaska, & Freedman, 2003). Cost is also relevant (Nies & Kershaw, 2002), and, as older people generally receive less encouragement for physical activity (Hayslip, Weigand, Weinberg, Richardson, & Jackson, 1996), the use of incentives and provision of regular feedback and instruction during exercise are imperative (Petosa, Suminski, & Hartz, 2003).

Given the increasing attention focused on the value of physical activity as a treatment and health management tool for the burgeoning older population, it is essential that program planners confront the multiple levels of influence so as to increase long-term exercise maintenance.

Theoretical Planning Framework

We selected the PRECEDE-PROCEED model for health program planning as the overall conceptual framework for the project (Green & Kreuter, 2005), as it is one of the most influential models for the planning of health programs. Its use provides for consideration of the shortcomings and strengths of previous community-based physical activity interventions and ensures that there is thorough consultation and comprehensive planning. It is consistent with the social ecological framework (Sallis, Johnson, Calfras, Caparosa, & Nichols, 1997).

The framework systematically considers the social and situational circumstances of the target group, relevant epidemiological data, environmental and behavioral (lifestyle) factors, and factors that influence these behaviors and the environments in which they occur (i.e., predisposing, enabling, and reinforcing factors; Green & Kreuter, 2005; Howat, Jones, Hall, Cross, & Stevenson, 1997). *Predisposing factors* are the motivators for physical activity and include knowledge, attitudes, and beliefs that may be addressed through relevant education. *Enabling factors* are characteristics of the environment, such as accessibility and cost of a program, as well as skills for accomplishing activities. *Reinforcing factors* include rewards for the physical activity behavior, such as support from walk leaders, peers, and family.

We identified predisposing, enabling, and reinforcing factors based on relevant components of the health belief model (e.g., perception of barriers and facilitators to physical activity behavior; Glanz, Rimer, & Lewis, 2002) and social cognitive theory (e.g., to measure

influences of the social environment on health behaviors; Bandura, 1986, 1997), along with SCT its central construct of self-efficacy. Increasing confidence to participate and maintain physical activity is enhanced via education, reinforcement, and opportunity to practice and to experience success with physical activity (Glanz et al., 2002; McAuley & Blissmer, 2000; McAuley, Jerome, Marquez, & Steriani, 2003). Social cognitive theory emphasizes the dynamic interaction of the individual's characteristics, his or her behavior, and the environment in which he or she functions. An effective intervention program should respond to these interactions.

This article presents selected process evaluation data to illustrate the program's development and structure. The purpose is to provide a practical approach for practitioners when designing neighborhood-based physical activity programs involving older people, with a particular emphasis on sustainability. Figure 1 summarizes the components of the program.

[Figure 1 about here]

Formative Research

Literature Review

The literature review identified the theoretical basis relevant to the program model. It gave an opportunity to identify the barriers and enablers to commencing and maintaining physical activity, as well as to consider how an individual and the environment interact. It provided valuable direction for the focus groups, identifying issues that required exploration and further clarification that would inform the development of the intervention program.

Research Expertise

The research team drew on its experience in intervention research (Howat et al., 1997) and physical activity programs (Clarke & Gordon, 2001; Fisher, Li, Michael, & Cleveland, 2004; Foreman, Walsh, Brown, Marshall, & Abernethy, 2003). Results from previous studies concerning older adults indicated that a range of neighborhood factors, such as social cohesion and access to facilities, are associated with increased walking (Fisher et al., 2004; Li et al., 2005).

Qualitative Data

Qualitative data obtained from focus groups provided an opportunity to explore aspects of the program that the older adults considered important. Researchers recruited 25 participants aged 65 to 75 years via the Positive Aging Association (an association for older people) and pensioner groups. They were purposely drawn from low to medium socioeconomic neighborhoods, as determined by Socio-Economic Index for Area values (Australian Bureau of Statistics, 1998). An experienced researcher conducted the focus groups, which lasted approximately 1 hr, at a location convenient to the participants. Researchers obtained informed consent, and each participant received a reimbursement of A\$10 for travel costs incurred. The researchers obtained permission to record the discussions and then made verbatim transcriptions. They analyzed the data using qualitative content thematic analysis. This approach is most suitable for qualitative descriptive studies, as it draws on the tenets of naturalistic inquiry (Sandelowski, 2000).

The aims of the focus groups were to determine (a) attitudes toward physical activity, and barriers and motivators to joining a walking group; (b) the preferred structure of a walking group; and (c) salient social supports. The Appendix gives the relevant questions asked. The

information helped inform the program planning and design. In particular, there was a need to change the mindset about walking capacity and the importance of providing older people with social experience and group support. In addition, being able to access the walking location was another popular issue, along with easy access to facilities such as toilets and resting spots.

Quantitative Data

Quantitative data collected from a baseline mail survey gave further insights into the uniqueness and potential fragility of the sample. The researchers were mindful that an older cohort of volunteers (Chatfield, Brayne, & Matthews, 2005; Jacomb, Jorm, Korten, Christensen, & Henderson, 2002) with a history of being physically less active (Martin & Sinden, 2001) and not highly motivated were less likely to complete the program. The baseline data showed that the participants had an higher than average body mass index (Dishman, 1991) and a lower SF12v2 Health Survey mental health score ($M = 48.1$; Chatfield et al., 2005; Jacomb et al., 2002; van der Bij, Laurant, & Wensing, 2002) when compared to the population mean of 51.6 for this age group (Ware, Kosinski, & Keller, 1996). A higher exercise self-efficacy score is generally linked to greater adherence (Martin & Sinden, 2001) and activity maintenance (Resnick & Spellbring, 2000). However, self-efficacy decreases as age increases (Resnick, Palmer, Jenkins, & Spellbring, 2000). The mean exercise self-efficacy score for the sample participants was 6.5 ($SD = 2.04$) on a Likert scale of 1 to 10 (McAuley & Mihalko, 2003). In effect, these factors emphasized the importance of encouragement and reassurance to the older people (Hayslip et al., 1996) and the need to enhance social support.

Participant Selection for Intervention

Researchers randomly selected the program participants from 30 neighborhoods within metropolitan Perth, the capital of Western Australia. Neighborhoods in the study were required (a) to be composed of at least 11% persons 65 years old or older, reflecting the State average (Australian Bureau of Statistics, 2001); (b) to contain at least 100 people older than 65 years; (c) to have a boundary not within 1 km of a waterway (i.e., a river or beach) in order to minimize the impact of the physical environment, or the so-called coastal effect, on physical activity (Bauman, Smith, Stoker, & Booth, 1999). (Bauman et al. found that respondents who lived near the coast were more likely to be sufficiently active.) Researchers selected the distance of 1 km after considering the definition of a walkable neighborhood (Pikora et al., 2002) and calculated it via a Geographical Information System. Researchers assigned neighborhoods to low, medium, or high level of socioeconomic status using the Socio-Economic Index for Area (Australian Bureau of Statistics, 1998).

Researchers sought and obtained written permission for access to the Federal Electoral Roll, which contains the name, age, and address of Australian citizens older than 18 years of age. To be eligible, participants were required to be (a) aged 65 to 74 years, (b) *insufficiently active* (defined as not achieving at least 30 min of moderate physical activity on at least 5 days a week; Lim & Taylor, 2005), and (c) healthy to the extent that participation in a low-stress walking program would not place them at risk for or exacerbate any existing health condition. The pool of potential participants drawn from the Federal Electoral Roll ($n = 7,378$) was then matched to the Perth Electronic Telephone Directory ($n = 6,401$). This telephone matching had an 86% success rate in identifying potential telephone contacts. Approximately nine phone calls were needed to recruit one participant, with the aim of recruiting 12 to 15 walkers per neighborhood.

Potential participants received a postcard explaining that their name had been randomly selected from the Australian electoral roll for involvement in a 6-month walking program. The postcard detailed who was conducting the research and that a phone call should be expected within the next fortnight. Consequently, potential recruits were aware of the project when contacted and knew that the program was legitimate. This method is successful at improving response rates (Iredell, Shaw, Howat, James, & Granich, 2004). The researchers later sought written consent from each participant on attendance at the first walking group session. Ethical approval was obtained from the Human Research Ethics Committee of the researchers' institution. A total of 260 participants completed the baseline questionnaire and thereby technically entered the 6-month intervention program. The mean age of participants was 69 years ($SD = 2.89$); the majority were female (67%, $n = 174$), had a partner (66%, $n = 172$) and Australian born (67%, $n = 174$). All participants were insufficiently active when recruited.

Tailored Intervention

The intervention program was designed to address motivators and barriers to physical activity. In particular, the local neighborhood meeting points were aesthetically pleasing (Ball, Bauman, Leslie, & Owen, 2001), safe (S. Booth, Mayer, Sallis, & Ritenberg, 2001), and had facilities such as toilets and park seating available for resting (Brawley, Rejeski, & King, 2003). The research team selected these meeting points by consulting a street directory and locating green spaces within the neighborhood. The team then visited the sites to assess suitability. The exercise locations were easily accessible (Ball et al., 2001; M. Booth, Owen, Bauman, Clavisi, & Leslie, 2000), thereby avoiding transport difficulties and costs associated with inconvenient locations (Corti et al., 1995; Godin, Desharnais, Valois, Jobin, & Bradet, 1994). The researchers

contacted the Council (local government) responsible for each meeting place and informed it of the program. The team obtained support and permission to access facilities such as toilets.

The walking groups met twice a week for 26 weeks. The walk leaders received a prescriptive progressive weekly exercise program that contained written information on the appropriate length for the walking program; illustrations for stretching exercises; and suitable ball skills, such as side twist leader ball. The graduated and standardized physical activity program commenced at a very low level and catered to the previously inactive older adults. The first meeting comprised 10 min of walking and two stretching exercises. By the end of 6 months, the group was physically active for 1 hr, which consisted of walking for 45 min plus doing flexibility and ball drills. This range of activities aimed to improve endurance, balance, and flexibility.

Moreover, individual tailoring enabled flexibility of the program. The walk leaders were able to modify the prescribed program to suit the needs of the individuals within their group. For example, the less able participants were provided with walking shortcuts, whereas the more able participants were encouraged to walk further and complete a greater number of exercises. This was possible because walk leaders were aware of the program's objectives (having undergone training), interacted closely with each of the walkers, and monitored their behavior.

Besides considering the factors of fatigue (Corti et al., 1995), the graduated program incorporated aerobic, strength, and flexibility training for increased health benefits and to maintain interest. Throughout the course of the program, walk leaders provided the walkers with new skills and regular feedback via 6-min walk tests (Bautmans, Lamber, & Mets, 2004), a tool suitable for assessing the exercise capacity of older people; as well as the Rating of Perceived Exertion (Borg, 1998). The Borg scale is based on physical sensations experienced while

exercising, such as increased heart rate, increased respiration, and fatigue. Participants received instruction in the procedure and how to monitor their pulse rate.

Walk Leaders

The volunteer walk leaders were young students recruited from Western Australian universities who were required to commit to the 6-month program. After interviewing them, the research team selected them based on their personality, enthusiasm, leadership quality, and empathy for older people.

The research team established a crucial link with the walk leaders. This successful relationship was achieved by maintaining support and open communication channels. Leaders and researchers remained in contact via telephone, e-mail, or postal mail on a weekly basis. The leaders were thus able to readily consult with the research team should any issues arise. This ensured that problems or queries were dealt with quickly and the intervention operated at its optimal level. The research team was aware of how important the walk leaders were to the program, so it spent time supporting them and forging relationships.

The walk leaders were required to inform the research team whenever they were unavailable. All walk leaders exchanged personal information so that another leader could be contacted to fill a position if necessary. A total of 30 regular walk leaders and 3 backup leaders were available. However, replacements for leaders were seldom required, and no walk leaders were lost during the program. All leaders had formed a relationship with their walkers and “cared about the members of their group.”

The walk leaders attended three 2-hr training sessions and received a Walking Leaders Manual on (a) the health benefits of physical activity, (b) example exercises, (c) safety issues, (d)

effective communication strategies, and (e) measurement and documentation procedures. They also received a suggested meeting point, a map of their neighborhood, and a pedometer to monitor the distances walked. They were also informed that the research team would conduct onsite spot checks to ensure the program was being implemented as intended.

To increase their commitment to the program, the research team award the trained walk leaders a small remuneration to cover transport costs and incidental expenses. The walk leaders appeared to be significant in motivating the walking groups. Postintervention surveys of the participants indicated that they perceived that their walk leader was “encouraging” (99%, $n = 162$) and “motivated them to continue with the program” (88%, $n = 156$).

Walk leaders coordinated the distribution of nonmonetary incentives such as Christmas cards and small gifts to each participant. They were also responsible for delivering and explaining any educational material. These materials were provided over the course of the program and included program pamphlets, exercise sheets, a calendar of suggested activities, health information, and a fortnightly “chatty” walker’s newsletter. An exercise gerontologist who was a member of the research team produced all materials, including the newsletter.

Social Support

The fortnightly newsletter provided specific information on health, walking, and exercise and contained profiles of walk leaders and researchers. Walkers were encouraged to contribute news items and photographs. The newsletter enhanced communication between the research team and the walking groups and was a valuable resource based on the anecdotal feedback from the participants. Indeed, 83% of respondents ($n = 98$) found the newsletter “interesting,” 52% ($n = 62$) reported that it “encouraged them to keep walking,” and 55% ($n = 65$) believed it “helped

them feel part of the walking group.” The majority of participants had at least one positive response to the newsletter.

Enhancement of social support was a planned component of the program aimed at encouraging group cohesiveness and physical activity maintenance. The walk leaders provided expert advice, reassurance, encouragement, and feedback to participants. They were also responsible for organizing social activities such as breakfasts and morning teas. These activities fostered social support and facilitated group cohesiveness (Corti et al., 1995; Warren-Findlow et al., 2003), which in turn are related to exercise adherence, intentions to be physically active, and perceived behavioral control (Carron, Hausenblas, & Mack, 1996; Chogahara, O’Brien Cousins, & Wankel, 1998). Research has consistently found that the social environment and friends influence participation in physical activity (Chogahara et al., 1998; Stahl et al., 2001), especially for older adults (O’Brien Cousins, 1995; Stahl et al., 2001).

Having the opportunity to be physically active in their own neighborhood with members of their local community appeared attractive and motivating to this older cohort, as it led to the development of social networks. For the older population, social networks are associated with higher levels of physical and mental health (Bennet, Schneider, Tang, Arnold, & Wilson, 2006; Grant, Todd, Aitchison, Kelly, & Stoddart, 2004; Wenger, 1990). Furthermore, friendships at a neighborhood level are vital because of mobility restraints related to both health and transport in this age group (Wenger, 1990). Social networking has additional benefits that flow to the community by improving the health of the whole neighborhood (Fisher et al., 2004).

Sustainability

A total of 65% of walkers completed the program. This is a reasonable adherence rate when compared to other programs with older persons (Dishman, 1994; McAuley, Courneya, Rudolph, & Lox, 1994; Morey et al., 2003). At least half of the walking sessions were attended by 93% of participants, and more than 85% of participants attended 70% of the walking sessions over the 6-month period. All groups continued to meet until the completion of the program. In terms of group size, 6 to 10 walkers was optimal based on feedback from the walk leaders.

The self-completed International Physical Activity Questionnaire (Craig et al., 2003) indicated that the baseline mean walking time for recreation was 1 hr ($SD = 1.65$), increasing to 2.69 hr ($SD = 2.02$) per week by the end of the program. Results of the self-completed postal satisfaction survey showed that the majority of walkers “felt fitter” (81%, $n = 143$), were “able to get more done in a day” (59%, $n = 102$), and were “more aware of health and well-being” (77%, $n = 136$). The participants acknowledged that they generally became more active (68%, $n = 121$), with some becoming involved in additional physical activities (26%, $n = 46$). The responses demonstrated the positive attitudes of the participants that served to reinforce continuing participation. The majority of walkers indicated that they would continue to walk twice a week when the program concluded (80%, $n = 141$) and in 6 months time (70%, $n = 124$). The research team conducted a separate follow-up postal survey 12 months post program. For those 113 respondents who completed the questionnaire, the mean weekly walking time for recreation was 2.51 hr ($SD = 3.60$). However, information on who actually kept walking was unavailable for nonrespondents.

The program incorporated a range of strategies to extend its life beyond the 6-month intervention. First, participants received health education as a scientific rationale for being

physically active. Second, they learned skills on correct stretching and strength exercises and how to effectively warm up and cool down, as well as techniques to monitor their physiological responses. Third, the small walking group environment enabled the walkers to interact with one another and form social networks in their local neighborhoods. Fourth, walkers interested in leading their group were identified and encouraged to do so post intervention.

This intervention was funded for A\$200,000. The estimated costs to replicate the intervention include salary for a part-time coordinator, intervention materials and incentives (\$30/person), postage (\$5/person), walk leader reimbursement (\$30/week/group), walk leader training (\$500/day), leader manuals (\$40 each), balls (\$5 each), pedometers (optional, \$21 each), administration costs (\$10/person), and process evaluation (\$5/person).

Study Limitations

We should address several limitations. The selected neighborhoods were required to have at least 11% people older than 65 years. These were older suburbs with more established infrastructure supportive of physical activity, which might compromise the generalizability of the findings. Data on control group and program dropouts were unavailable. However, there was a reasonable adherence rate, as 65% of participants completed the program. The research team successfully accomplished this project within the available budget, but replication of the study on a large scale would require substantially more resources, funding, and volunteers. It would also require the careful selection of walk leaders and admission to the networks to access them. Most tertiary institutions have students of high caliber to provide a pool of walk leaders.

Conclusions and Recommendations

The physical activity intervention program described in this article was specifically tailored for the older adult. Its development followed detailed consideration of the literature and careful consultation with the target group. The researchers placed an emphasis on creating a supportive social and physical environment for physical activity. The program content was responsive to the dynamic interaction of the individual and the environment. It provided updated skills and social networks in order to increase the likelihood of continued physical activity and program sustainability.

The program provided a practical community-based method for mobilizing older people. It should be a useful guide for others intending to implement similar interventions. This article has highlighted several factors for consideration in future studies. These include the value of tertiary students as a skilled resource, the use of volunteers to contain cost, the importance of a tailored progressive program, the appropriateness of walking as a form of physical activity for this age group, the enjoyment associated with being in a walking group, the receptiveness to learning new skills with regard to exercises and ball drills, and the usefulness of social support.

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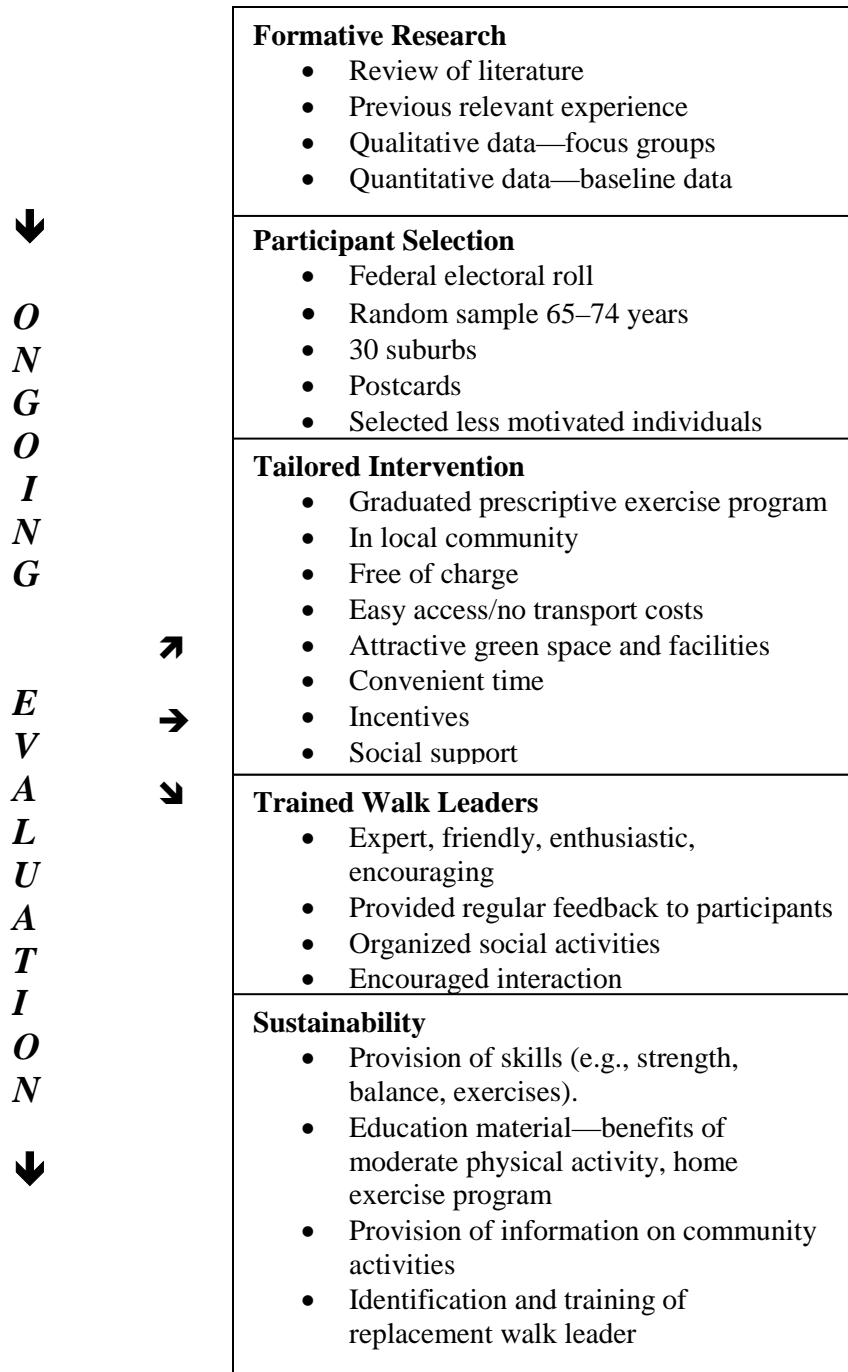
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Figure 1. Program components.



Appendix

Relevant Focus Group Questions

- When you think about walking, what makes it unappealing?
- If you were invited to join a walking program, what would stop you?
- What would make you want to join a walking group?
- What would make it easier for you to participate in a walking program?
- How would you like the program set up?
- What kind of information or educational material would you like?
- What would you like in regard to social activities or social supports?