

Effectiveness of Recruitment Strategies for a Physical Activity Intervention in Older Adults With Chronic Diseases

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Background: Engaging sedentary individuals in physical activity (PA) is challenging and problematic for research requiring large, representative samples. For research projects to be carried out in reasonable timeframes, optimum recruitment methods are needed. Effective recruitment strategies involving PA interventions for older adults have not been determined. **Purpose:** To compare the effectiveness of recruitment strategies for a PA intervention. **Methods:** Two recruitment strategies, print media and personal contact, targeted health-care professionals and the general public. **Results:** The strategies generated 581 inquiries; 163 were randomized into the study. Advertising to the general public via print materials and group presentations accounted for 78% of the total inquiries. Referrals from physicians and health-care professionals resulted in 22% of the inquiries. **Conclusion:** Mass distribution of print material to the general public, enhanced by in-person contact, was the most effective recruitment strategy. These findings suggest various recruitment strategies targeting the general population should be employed.

Key Words: exercise, randomized controlled study, enrollment, health-care professionals

The majority of Canadians are inactive, with the greatest proportion observed among older adults.¹ In the older adult population, 67% of women and 55% of men are not physically active enough to achieve health benefits² and, as a result, the

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economic burden of physical inactivity in Canada is staggering.³ As the incidence of lifestyle-related disease, disabilities, and death continues to increase,⁴ the importance of adopting and maintaining an active lifestyle is paramount in decreasing health-care costs associated with a sedentary lifestyle and an aging population. However, encouraging sedentary individuals to adopt a physically active lifestyle is a challenging endeavor. Further evidence is necessary to determine effective strategies to promote the adoption and maintenance of physically active lifestyles. This requires intervention research that utilizes carefully designed randomized controlled trials that specifically target older adults. These types of studies, however, require the recruitment of sedentary individuals into long-term intervention programs. In order for research projects to be carried out in reasonable time frames and with appropriate sample populations, information regarding optimum methods to recruit older adults is essential.

Recruiting older individuals into research projects has traditionally been difficult,^{5,6} with study duration⁷ and perceived benefits and risks⁸ influencing the success of the recruitment strategy. To date, few studies have evaluated strategies to recruit older adults into physical activity intervention studies. Thus, there are limited data on successful strategies to generate interest among older adults to participate in research endeavors, ultimately obtaining a high proportion of eligible participants. This latter goal is especially important, because earlier work reported that, for every 9 to 12 inquiries, only 1 will be eligible for randomization into a study.^{9,10} Aside from inclusion and exclusion criteria, several reasons have been cited as potential barriers affecting the recruitment of community-dwelling older adults. These include physical (i.e., general health, chronic illness, impaired sensory function), social (i.e., family and friend support, physician and healthcare professional advice or approval), and psychological factors (i.e., cognitive function, perceived personal benefits, motivation). In addition, age and gender could also affect recruitment, because response rates are generally lower in older adults than in the younger population and, in particular, fewer male participants.⁷

To date, much of the recruitment literature has reported on the effectiveness of recruitment strategies for multicenter pharmacological interventions.¹⁰⁻¹⁴ Given the limited data on recruitment strategies for nonpharmacological interventions such as physical activity, our purpose was to evaluate the effectiveness of various strategies to recruit older adults with chronic diseases into a physical activity study ("50+ In Motion") comparing class- and community-based programs. The costs associated with the recruitment strategy were also assessed.

Methods

This study sought to recruit individuals into 50+ In Motion, a randomized clinical trial comparing class- and community-based physical activity programs for adults age 50 years and older with chronic diseases. Eligible participants were informed they would be randomly assigned to either an unstructured, unsupervised community-based program of their choice (the "community arm") or a structured, supervised, class-based program (the "First Step" program, a prevention and rehabilitation program for people with chronic diseases, combining physical activity and education) carried out 3 times per week in a city leisure center.

Recruitment Strategies

Before the enrollment process, a registered nurse with a background in public health was hired as the lead person to design and implement a recruitment strategy in collaboration with the project steering committee. The goal of the recruitment strategy was to increase enrollment of older adults in a physical activity intervention study (50+ In Motion). Two recruitment strategies were designed based on suggestions from the literature: one encouraging health-care professionals to refer patients to the study and the other encouraging the general public for self-referral.

Referral by a Health-Care Professional. Given the type of chronic illnesses of interest for this study, health-care professionals targeted included physicians, physiotherapists, chiropractors, nurses, dietitians, pharmacists, and diabetes educators, as well as hospital nursing units. The registered nurse hired to lead recruitment contacted health-care professionals for in-person appointments to explain study details. Information packages were also provided, which included letters detailing the study, glossy posters and brochures to be displayed in clinics, and patient/client referral sheets to be faxed to the research office. When in-person contact with a health professional was not possible, an information package was left with office staff along with details for contacting the recruitment strategist or research office for more information. In total, 135 physicians, 56 chiropractors, 8 physiotherapy clinics employing approximately 50 physiotherapists, and 2 dietitians were contacted and provided with information packages. Information packages were also provided to the nursing staff of 12 hospital wards (4 wards in each of the 3 local hospitals).

Additional methods to promote referrals from health-care providers included display tables at 3 continuing professional education conferences (2 medical, 1 nursing); 2 diabetes conferences (aboriginal diabetic conference, a healthy living conference); presentations at regular staff meetings for physiotherapy (2), home-care (7), and diabetes education professionals (1); and presentations at the citywide department of family medicine meetings (2) by one of the coinvestigators, a family physician.

Referral by the General Public. The general public was recruited for self-referral primarily via the mass media. Two paid advertisements, 1 in the fall and 1 in the winter, were placed in a weekly newspaper delivered to all homes in the city and area. The study was also summarized in a feature article in the same newspaper in the spring. Free advertisements were placed in community and service group newsletters, church bulletins, and publications of specific interest to older adults, accounting for 50 notices in all. In addition, 100 posters were placed in highly visible areas in pharmacies, grocery stores, weight-loss clinics, service clubs, public health clinics, nonprofit social service agencies, natural-health centers, seniors' buildings, primary health centers, city leisure facilities, libraries, churches, hospitals, local businesses, and shopping malls, as well as at the local offices of the Heart and Stroke Foundation and Canadian Diabetes Association. Information tables were set up at influenza vaccination clinics organized by the public health department and at blood-pressure, cholesterol, and diabetes clinics. Furthermore, information was presented to 12 senior- and community-group meetings (e.g., Rotary, Lions, Kinsmen clubs), 5 seniors' housing complexes, and 16 work sites (e.g., banks, police

services, Federated Co-op). Finally, the study was profiled by a local television program, *The Health Show*, shown multiple times by a local cable station.

Recruitment Costs and Time

The overall recruitment cost consisted of the salary of the registered nurse and printing of mass-media materials. Total time spent on subject recruitment was based on the number of hours devoted to the project by the registered nurse. The calculated cost per inquiry overall was derived by dividing the cost of the recruitment strategy by the number of inquiries. Similarly, the cost per randomized participant was obtained by dividing the recruitment cost by the number of randomized participants. Costs for the 2 strategies were computed separately in a similar manner using the proportion of time devoted to each strategy.

Subjects. Inclusion criteria for the target population included a) age 50 years and over; b) one or more of the chronic health conditions overweight or obesity (BMI between 25 and 40 kg/m²), stable type II diabetes mellitus, osteoarthritis, high blood pressure or high blood cholesterol; and c) the ability to participate safely in a physical activity program without direct monitoring or supervision. Participants were excluded if they had a prior history of stroke or cardiac or chronic respiratory disease, were regularly active more than twice a week for the preceding 6 months, or had prior involvement in the class-based intervention program (First Step). Individuals with type II diabetes were required to undergo an exercise tolerance test before acceptance into the study, and those with evidence of silent ischemia were excluded. Those meeting the eligibility criteria took the Functional Fitness Test¹⁵ and the Physical Performance Test¹⁶ and had measurements taken of height, weight, and waist and hip girth. Participants were then required to complete 2 exercise familiarization sessions (EFS) within 7 to 10 days of the baseline assessment to ensure safe participation in a physical activity program. After the 2nd EFS, participants were randomized into the study.

Intervention. Participants assigned to the First Step program exercised under the guidance of trained instructors who assessed the individuals' needs and developed individualized exercise programs consisting of endurance, resistance, and flexibility exercise. Ten education sessions on goal setting, benefits of activity, nutrition, weight control, stress management, stages of behavior change, arthritis, footwear and foot care, and risk factors for heart disease were offered to all participants within the first 6 months of randomization. Individuals randomized to the community arm received physical activity program options and advice on exercise frequency, intensity, and duration, as well as safety precautions from trained individuals. In addition, they received regularly scheduled follow-up telephone calls to answer questions related to physical activity. All participants in the community arm were provided with the option of attending education classes within the 1st 6 months of randomization on the same topics provided to those in the First Step program. The randomization procedure and details of the study protocol were explained to all participants before they entered the study. Although the cost of the physical activity program was the responsibility of each participant, it was explained during the screening procedure that funding was available for individuals who felt that money was a barrier to their participation.

Results

In total, the research office received 581 inquiries over a 10-month period, resulting in 163 participants randomized into the intervention study. Because individuals could have learned about the study from a number of sources, we attempted to identify the most recent recruitment strategy that prompted their inquiry (Table 1). Referrals from health-care professionals accounted for 127 (21.9%) of the calls, and 50 of those participants were randomized into the study. Of all referrals made by health-care professionals, 74% were from physicians; however, 87% of these referrals were received from 1 physician.

Inquiries generated by the general public yielded 454 calls (78.1%), with 113 individuals being randomized. Inquiries that did not result in successful recruitment were most often the result of participant ineligibility (27.6%) or “other” (34.6%) (e.g., individuals either indicating that they wanted more information or needed to think about it, or could not be contacted after they left a message; Table 2). Women accounted for the majority of interested participants (75.3%) and subsequent enrollees (73.6%) into the study. Although data for age were not available for all persons inquiring about the study, study participants ranged in age from 50 to 82 years (mean age = 60.3, *standard deviation* = 7.42). One-way ANOVA and chi-square analyses were used to assess differences in baseline demographics (marital status, education, employment, and income) and defined health conditions (hypertension, abnormal cholesterol, diabetes, osteoarthritis, and overweight) between the 2 study groups based on recruitment strategy. There were no significant differences in baseline demographics or health conditions based on recruitment method, with the exception that more participants with diabetes were referred by health-care professionals than were self-referred ($P = 0.000$).

The majority of the registered nurse’s time (73%) was spent initiating in-person contact with health-care professionals. The total cost of the recruitment strategy was Can\$27,220.00. Almost 90% was attributed to the part-time salary of the registered nurse, with the remaining 10% covering the cost of the print material. The cost per inquiry averaged approximately Can\$47.00, and the cost per

Table 1 Source of All Referrals

Source of referral	Number of inquiries (total = 581)	Percent
Family physician	94	16.2
Medical specialist	1	0.2
Chiropractor	17	2.9
Physiotherapist	6	1.0
Other health-care professionals	9	1.6
Word of mouth	27	4.7
Advertisement/Poster	250	42.9
Presentation/Conference	73	12.6
Unknown	104	17.9

Table 2 Recruitment Success

Recruitment outcome	<i>n</i>	Percent
Enrolled	163	28.1
Not eligible	160	27.6
No time/too busy	2	0.3
Not convenient	12	2.1
Lack of money	5	0.9
Don't want to commit	34	5.9
Misunderstood project	4	0.7
Other	201	34.6

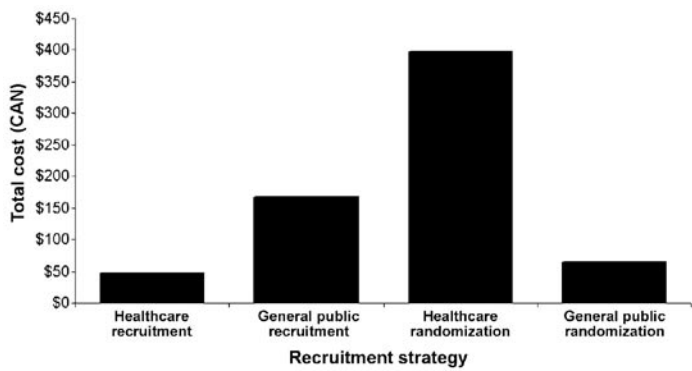


Figure 1 — Costs per participant for recruitment and randomization based on recruitment strategy.

randomized participant into the study was Can\$167.00. Recruitment costs were also considered for each of the 2 recruitment strategies. The cost per randomized participant referred by a health-care professional was approximately Can \$397.00 and the cost per person for randomized participants who were self-referred was Can\$65.00 (Figure 1).

Discussion

The purpose of this study was to investigate the effectiveness of recruitment strategies targeting older adults with chronic diseases to volunteer for a physical activity intervention. The results of the study indicated that targeting the general public for self-referral was the most effective recruitment strategy, accounting for 78% of the inquiries and 69% of those successfully recruited. This finding supports previous recruitment literature showing that mass-circulation advertisements including posters, newspaper ads, community newsletters, and church bulletins generate a high response rate and are low in cost.^{7,17,18} Based on these results, we suggest that

recruitment strategies that are low in cost and have the ability to reach a large target audience are likely to be more successful than any 1 specific strategy.

Existing research on the recruitment of older adults has suggested that time and effort of the researchers and adequate funding for the project itself are essential for successful recruitment.¹⁹ To address these issues, we hired a registered nurse whose sole purpose was to recruit participants for the study and dedicated research staff who carried out the daily administrative priorities involved in a large-scale study. Research staff members were also available to explain the details of the study and to screen interested participants. As it was thought that a successful recruitment strategy would require a large amount of time devoted to in-person contact, it was deemed appropriate to hire a health professional to focus on this activity.

Recruitment research has indicated that the predicted time to obtain the appropriate sample size is often misjudged,¹⁹ and only rarely are the required number of subjects enrolled within the original time frame.⁸ The 50+ In Motion project had a recruitment time line of 10 months, which was considered sufficient time to recruit the desired sample size of 330 subjects. Preliminary figures after 5 wk into the recruitment strategy did not alter our projections, because the recruitment strategy generated 153 inquiries, 71 of which resulted in enrollment in the study. The recruitment strategy targeting both health-care professionals and the general public began in September; between November and mid December, however, only 20 subjects were enrolled. A 2nd wave of recruitment, again targeting health-care professionals and the general public, occurred during January and February and resulted in enrollment of an additional 42 subjects. The remaining 33 subjects were enrolled in the final 4 months of recruitment. The 2 waves of recruitment were attributed to the timing of the ads placed in a free community-wide newspaper that appeared at the beginning of the recruitment process (September) and again at the start of the new year. A seasonal trend could also explain recruitment success, as is the case in First Step (the class-based intervention program), where enrollment rates traditionally tend to increase in the fall after summer holidays and again in January after Christmas.

Although interest in the study was continuous throughout the time frame of the recruitment strategy, nearly 30% of those who expressed interest did not meet the inclusion criteria. Approximately 6% of eligible subjects reported unwillingness to participate in a study that lasted for 1 yr. Only 1% of subjects indicated that lack of money was a barrier to participation. However, this was not surprising, because lack of time is usually cited as a primary barrier to physical activity participation and because participants were informed that funding was available to offset the cost of the physical activity programs. Although transportation is often described as a barrier for older adults participating in research studies,²⁰ it was surprising that only 2% of the eligible sample indicated transportation as a barrier.

Previous research has suggested that individuals who are advised by a health-care provider to engage in physical activity are more likely to be interested in a physical activity study.²¹ Although it has been suggested that the endorsement of research studies by health-care professionals such as physicians, nurses, chiropractors, and physiotherapists can provide credibility to the project, thus influencing an individual's participation,⁷ recruitment by health-care professionals has generally been less effective.²² This was confirmed in the present study, in which 213 recruitment packages delivered and explained to physicians and health-care

professionals resulted in only 22% of referrals. Although 120 family physicians and 15 specialists received information on the study, only 16% of the inquiries were from direct physician referral. These referrals yielded an enrollment rate of 25%, although it must be emphasized that 87% of referrals were received from 1 physician. Without the referrals received from this physician, greater differences between the cost-effectiveness of each approach would be apparent. For example, with the randomized participants recruited by this physician removed, the cost per randomized participant referred by a health-care professional would have been over Can\$900.00. The physician responsible for this high recruitment rate was not a member of the study group.

Before the study, the research team was concerned that physician referral might be limited by time constraints on physicians in busy practices.^{17,23} Every attempt was made to reduce the clinician burden by designing a simple physician referral that could be faxed to the research office and assuring physicians that the research staff would fully inform participants of study details. Low physician referral rates resulted, despite 2 personal contacts by the R.N. with 36% of the family physicians who expressed an initial interest in participating in the study. Of these, 27% received 3 or more personal contacts. Although we did not investigate the physicians' personal interests in the study, others have reported that recruitment rates could be adversely affected if there is low enthusiasm for the topic among physicians.²⁵ However, research projects that are of "concrete daily interest" to physicians might be perceived as more attractive²⁴ and hence could result in higher referral rates. This latter finding might explain the high referral rate of one of the physicians participating in the present study. Future research should explore the barriers and motivating factors, including physician's personal interests related to the physical activity, that could affect their referral of patients to these types of programs.

As with physicians, our results also indicate minimal success in obtaining referrals from other health-care professionals (e.g., nurses, physiotherapists, chiropractors, dieticians). In contrast to other studies indicating success in recruiting older adults into research studies through primary health-care providers,¹⁷ our results indicate that health-care professionals collectively accounted for only 5.5% of total referrals. For approximately 18% of the initial phone calls, data regarding source of referral were not obtained; however, these calls were attributed to the recruitment strategy targeting the general public (e.g., posters, ads, word of mouth), because it was assumed that all health-care-professional referrals would have been received in the form of a direct referral to the research office. Note that 39% of those referred from health-care providers were randomized into the study, whereas self-referral from the general public resulted in only 24.8% being randomized. Although this could suggest that health-care providers were selective in their referrals (i.e., pre-screening and referring only patients who met all eligibility criteria), 24.4% of participants referred by health-care professionals were ineligible for the study.

Adding to the challenge of recruitment is the common problem of obtaining a representative sample of the population. Research suggests that the sampling approach can influence the representativeness of the sample.⁷ Although there is a tendency in the literature to consider the older adult population as homogeneous, this is not the case given different life experiences and situations.⁷ Many studies recruit a convenience sample through community advertising, thus recruiting

participants who are typically self-selected, healthy, and motivated.²⁶ In addition, Halbert et al.²⁷ suggest that projects involving physical activity interventions tend to recruit a volunteer population composed of healthy individuals who have a personal interest in physical activity. Although motivation to begin a physical activity program might have been the initial impetus for inquiring about the present project, we specifically sought to recruit individuals with chronic conditions who were not physically active.

An additional goal of recruitment was to obtain a representative sample of both men and women. Since the majority of individuals inquiring about the project at the outset were female, the R.N. targeted predominantly male community-service organizations (e.g., Lions, Rotary, and Kinsmen service clubs). In the end, 24% of the general inquiries were received directly from men, resulting in an enrollment rate of 25%. Although some studies suggest that men are less likely than women to participate in research studies,²⁸ others have found that men are more likely to participate.⁷ Although some suggest that older men are more easily recruited, because they are retired and have more time,²⁹ in our study women were more easily recruited than men by a 3:1 ratio. Therefore, we suggest more aggressive recruitment strategies to increase male participation in physical activity research projects, particularly in the older adult population.

Conclusion

This project focused on effective strategies for recruiting older adults into a physical activity study. Based on our findings, we suggest that adequate time be devoted to developing and implementing a comprehensive recruitment approach during the initial stages of a project. We also recommend that the total cost of a recruitment strategy, including both personnel and materials, should be considered in preparing the funding budget. Although health-care professionals with an interest in the proposed research might be a valuable source for recruitment, we suggest that targeting the general public is more cost-effective, reaches a larger target audience, and subsequently results in higher recruitment rates. Given the low enrollment of men in our study, additional recruitment strategies focusing on older men might be warranted.

Acknowledgment

This research was supported through a Community Alliances for Health Research grant by the Canadian Institutes for Health Research.

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