Implementing a Community-Based Falls-Prevention Program: From Drawing Board to Reality*

Johanne Filiatrault,[1,2,3,4] Manon Parisien,[5] Sophie Laforest,[3,5,6] Carole Genest,[1] Lise Gauvin,[3,7,8] Michel Fournier,[9] Francine Trickey,[9] and Yvonne Robitaille[1,7,10]

RÉSUMÉ

Plusieurs études ont démontré, à l'aide de devis randomisés, l'efficacité de programmes de prévention des chutes destinés aux aînés vivant dans la communauté. Cependant, on connaît peu de choses quant à la faisabilité d'implanter ces programmes dans des conditions naturelles et quant à l'efficacité de ces programmes lorsqu'ils sont offerts dans de telles conditions. Les objectifs de cet article sont de: (a) décrire un programme multifactoriel de prévention des chutes (PIED) destiné à des aînés autonomes vivant dans la communauté et (b) présenter les résultats d'une analyse de la faisabilité d'une implantation du programme dans les organismes communautaires. Le programme a été implanté dans 10 organismes du milieu communautaire situés dans la région métropolitaine de Montréal dans le contexte d'une étude d'efficacité. Les résultats concernant la population recrutée et la façon dont le programme a été offert, ainsi que le niveau de participation au programme montrent qu'un programme de prévention des chutes visant plusieurs facteurs de risque peut être implanté avec succès dans des milieux communautaires.

ABSTRACT

Several studies have demonstrated the efficacy of falls-prevention programs designed for community-dwelling seniors using randomized designs. However, little is known about the feasibility of implementing these programs under natural conditions and about the success of these programs when delivered under such conditions. The objectives of this paper are to (a) describe a multifactorial falls-prevention program (called Stand Up!) designed for independent community-dwelling seniors and (b) present the results of an analysis of the practicability of implementing this program in community-based settings. The program was implemented in the context of an effectiveness study in 10 community-based organizations in the Montreal metropolitan area. Data pertaining to the reach and delivery of the program as well as participation level show that a falls-prevention program addressing multiple risk factors can be successfully implemented in community-based settings.

[1] Institut national de santé publique du Québec

[2] Programme de doctorat en santé publique, Université de Montréal

[3] Groupe de recherche interdisciplinaire en santé (GRIS)

[4] École de réadaptation, Université de Montréal

[5] Centre de Santé et de Services sociaux Cavendish—Centre affilié universitaire en gérontologie sociale

[6] Département de kinésiologie, Université de Montréal

[7] Département de médecine sociale et préventive, Université de Montréal

[8] Centre de recherche Léa-Roback sur les inégalités sociales de santé de Montréal

[9] Direction de santé publique de Montréal

[10] Department of Epidemiology and Biostatistics, McGill University

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Keywords: aging, falls prevention, program implementation, community-based organizations, community-dwelling seniors

Requests for offprints should be sent to:/Les demandes de tirés-à-part doivent être adressées à:
Johanne Filiatrault, O.T., M.Sc.
École de réadaptation, Université de Montréal
C.P. 6128, Succursale Centre-ville
Montréal, Québec, H3C 3J7
(johanne.filiatrault@umontreal.ca)

Introduction

Falls among seniors are a major public health concern because they have a high incidence and impose substantial personal and societal burdens (Marks & Allegrante, 2004). Consequently, many falls-prevention initiatives have been developed across Canada (Public Health Agency of Canada, 2005). Over the past decade, numerous studies evaluating the impact of falls-prevention programs designed for community-dwelling seniors have been published. Reviews of randomized clinical trials show that programs including exercises and targeting multiple risk factors are effective in reducing falls incidence (Chang et al., 2004; Gillespie et al., 2003; Weatherall, 2004).

Although randomized clinical trials are of an incontestable value in establishing intervention efficacy, researchers have recently underscored the importance of other types of studies, such as effectiveness trials (Glasgow, Lichtenstein, & Marcus, 2003; Victora, Habicht, & Bryce, 2004). It is argued that it is not sufficient to show that a program is effective under controlled conditions but that it is also crucial to demonstrate that it can reach its objectives when implemented under natural conditions (Prohaska et al., 2006). Indeed, the natural heterogeneity that characterizes real-world settings dictates that implementation conditions are likely to vary from one setting to another. As a result, the prerequisite conditions for program success—such as appropriate reach, delivery, and exposure—may not be present. Therefore, it is essential to address questions like ''Are practice milieus able to recruit the target population?'' ''Are they able to deliver the intervention as intended?'' and ''Are they able to ensure optimal participation in the program?'' In sum, the feasibility of implementing a program in natural settings must also be demonstrated. Unfortunately, there is a gap in the falls-prevention literature on this issue. Therefore, the objectives of this paper were to describe a multifactorial falls-prevention program (called Stand Up!) designed for independent community-dwelling seniors and to present the results of an analysis of the feasibility of implementing this program in community-based settings. More specifically, we chose to examine if community-based organizations were able to meet the three prerequisite criteria for program success: (a) reaching the target population, (b) delivering the program according to program guidelines, and (c) achieving sufficient program participation rates. Towards these ends, we first describe the program goals, components, training principles, conceptual models, underlying logic model, and program outcomes. Next, we describe how the intervention was delivered in 10 community-based organizations participating in an effectiveness study to draw inferences about program reach, delivery, and participation level.

The Intervention

Stand Up! (or PIED, for Programme intégré d'équilibre dynamique, in French) is a multifactorial falls-prevention program developed in 1995 by interventionists and researchers from the Montreal Public Health Department in collaboration with physical activity and rehabilitation experts and representatives of community-based organizations. Stand Up! is designed to meet the needs of independent community-dwelling seniors, with special emphasis on senior who have a history of falls, seniors who are afraid of falling, or seniors concerned about their balance (Trickey, Parisien, Laforest, Genest, & Robitaille, 2003). Like most interventions, Stand Up! was created through iterative steps. Table 1 outlines the chronology of its development and evaluation.

Stand Up! is a 12-week program that aims at modifying a variety of risk factors. It consists of three components: group exercise classes (1 hour, twice per week), a home exercise module (30 minutes practice, at least once per week), and information/discussion classes (30 minutes, once per week). Stand Up! has five specific goals: (a) improve balance and leg strength, (b) develop skills required to reduce home hazards and adopt fall-safe behaviours, (c) enhance feelings of efficacy related to falls prevention, (d) maintain bone density, and (e) encourage regular involvement in physical activity.

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Table 1: Major phases in Stand Up!' s development and evaluation

Phases	Goals	Methods	Results
1995 Program conception	Develop a rigorous program, feasible within community-based organizations' context	• Consultation with community groups and experts in rehabilitation and physical activity • Literature review • Analysis of available programs	Publishing of the first edition of the program in French (named PIED) (Trickey, Parisien, Robitaille, Gosselin, & Laforest, 1999)
1996 Pilot study	Assess program's potential for reducing risk factors	Quasi-experimental design (experimental: $n = 27$; control: $n = 16$)	Suggestion that impact of the program on participants' balance is positive (Trickey, et al., 1999)
1997–2000 Follow-up of program's natural implementation	Get feedback from community-based organizations that adopted or were interested in adopting the program	• Interviews ($n = 7$) • Phone survey ($n = 51$) • Focus group ($n = 21$)	Identification of facilitators and barriers to implementation (Trickey et al., 2001)
2000–2002 Program re-engineering	• Include recommendations provided by organizations to facilitate implementation • Update program content • Translate program from French to English	• Consultation with experts and representatives from community-based organizations • Literature update	• Publishing of a new edition of the program (Trickey et al., 2002) • Translation of the program and publishing of the English version (Trickey et al., 2003)
2002–present Effectiveness study of the program when delivered under the natural conditions of community-based organizations	• Assess program's impact on participants' static balance, mobility, stability limits, and leg strength • Assess program's impact on maintenance of involvement in physical activity • Assess program's impact on balance confidence, perceived balance, and fear of falling • Assess program's impact on falls incidence	• Quasi-experimental design • Measurements at pre-test, post-test, 3-month post-test, and 9-month post-test • Ten experimental organizations ($n = 98$) • Seven control organizations ($n = 102$)	• Positive impact of the program on static balance and mobility at the end of the program (Robitaille et al., 2005) • Positive impact of the program on two indicators of involvement in physical activity 9 months after the program: variety of physical activities and energy expenditure (Laforest et al., 2006; Laforest et al., under review) • Impact of the program on balance confidence, perceived balance, and fear of falling (Filiatrault et al., 2006; Filiatrault et al., under review) • Impact of the program on falls incidence (Robitaille, et al., under review)

Table 2 outlines evidence-based training principles that guided the conception of exercise components and provides examples of how they were integrated into the program (American College of Sports Medicine, 2000; Duncan, Chandler, Studenski, Hughes, & Prescott, 1993; Topp, Mikesky, & Bawel, 1994). The group exercise component of the program aims at improving dynamic balance, strength, and flexibility, and stimulating proprioception. Each exercise class is divided into four phases: (a) warm-up (with lower limb proprioception and ankle flexibility exercises), (b) dynamic balance exercises (with obstacle courses and movements inspired by Tai Chi), (c) strengthening exercises (using Therabands® to strengthen hip abductors), and (d) stretching and relaxation.

The home exercise component consists of 12 simple exercises to be performed independently by participants at least once a week during the 12-week program and a few times a week when the program is completed. These exercises are explained and practised during the first exercise class and are illustrated on a small poster that can be used at home as a reminder and practice guide.

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Table 2: Operationalization of training principles in the exercise components of Stand Up!

Training Principles	Operationalization in the Program
Training Volume	At least one home practice session (30 min.) is added to group exercise classes (2 × 60 min.) to ensure sufficient training time on a weekly basis.
Specificity	Exercises are designed to target the physiological components involved in balance and meet other program goals.
Overload	Exercises challenge balance and strength more than what is usually required in daily life (e.g., standing on one leg, standing on an unstable surface).
Gradation	The intensity of exercises is gradually increased, and conditions are of increasing complexity (e.g., eyes open, then closed during unipodal exercise).
Personalization	Suggestions are provided in program guide to adapt exercises to each participant's capacities (e.g., exercising with or without support).
Minimize Adverse Effects	Instructors should monitor signs of fatigue and discomfort and ensure safety at all times. A co-leader is recommended for groups including more than 10 participants, to ensure safe supervision.
Minimize Detraining	Home training continuation should be encouraged at the end of the program. A list of other available programs in the community should be provided to participants.
Maximize Participation	The instructor should phone absent participants after exercise classes. Leadership tips are provided in the program guide to make the program enjoyable and gratifying.

The educational component of Stand Up! includes 10 weekly 30-minute information/discussion classes. To optimize program participation, these classes are held at the beginning or at the end of an exercise class. As shown in Figure 1, the PRECEDE/PROCEED model (Green & Kreuter, 2005) was used as a guide during the planning phase of this component of the program. The educational approach suggested for these classes was inspired by health behaviour models (Bandura, 1977; Bandura, 1986; Rosenstock, 1990). Information/discussion classes focus on participants' personal experience and on learning through modelling, personal reflection, experimentation, and positive reinforcement. They cover topics such as strategies to increase home safety, fall-safe behaviours, osteoporosis prevention, appropriate shoes, safe drug consumption, and exercise maintenance.

The program was designed to be offered by community-based organizations to groups of 10 to 15 seniors.

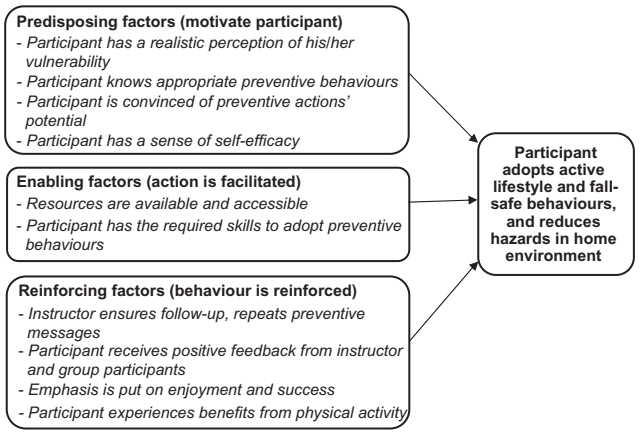


Figure 1: PRECEDE-PROCEED model underlying information/discussion classes

However, since Stand Up! targets independent seniors who may present mild balance alterations, it should be delivered by experienced rehabilitation or exercise professionals. A detailed program guide in English and in French is available to instructors (Trickey et al., 2003; Trickey, Parisien, Laforest, Genest, & Robitaille, 2002). This guide provides helpful tools for each step of the implementation process. It also includes a physical screening questionnaire (named the Capacity-for-Exercise grid) that was developed especially to screen out seniors who are unable to perform relatively demanding exercises within a group context. This grid includes questions regarding physical capacity, such as "Can you walk two blocks without getting out of breath or so tired you need to sit down?" and a series of questions addressing health problems. A 1-day training session is available to prepare professionals to become Stand Up! instructors. More information about the program and a list of available publications can be found on the Web site of the Montreal Public Health Department (see Agence de la santé et des services sociaux, 2006, 2007).

Figure 2 illustrates the program's logic model. It shows the linkages between Stand Up!'s components and its expected outcomes. It also highlights three prerequisite conditions for the program's success: that the program reach its target population (*program's reach*), that the program be offered as intended (*program's delivery*), and that participants attend a reasonable number of exercise classes (established for this study as 75% of the classes or more) and comply with the home exercise module (*program's exposure*).

Program Outcomes

As indicated in Table 1, an effectiveness study recently showed that Stand Up! improved static

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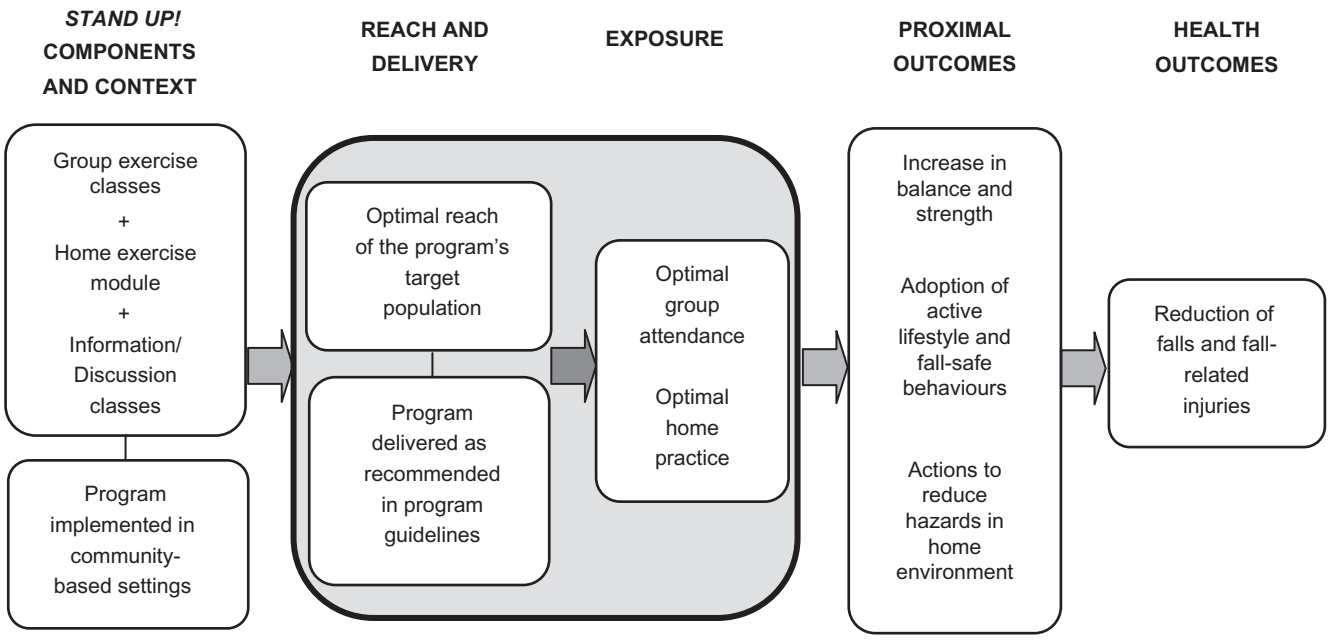


Figure 2: Stand Up!'s underlying logic model and the emphasis of this current paper

balance and mobility among independent community-dwelling seniors recruited through community-based organizations (Robitaille et al., 2005). This study was conducted with a sample of 200 community-dwelling seniors aged 60 years and over and living in the Montreal metropolitan area. Ninety-eight participants were recruited from 10 community-based organizations considered as *intervention sites* and 102 participants were recruited from 7 community-based organizations considered as *control sites*. A series of variables, including static balance and mobility performance, was measured at baseline, immediately after the intervention (post-test) as well as 3 months and 9 months after the completion of the intervention. An analysis of program outcomes at post-test showed that static balance and mobility improved more among participants in intervention sites than among participants in control sites (Robitaille et al., 2005).

Methods

Recruitment of Organizations into the Effectiveness Study

The effectiveness study was approved by the Montreal Regional Health and Social Services Board's ethics committee, which ascribes to the Tri-Council Ethics Statement and Procedures. To recruit organizations for the effectiveness study, an invitation was sent to representatives of community-based organizations that had previously expressed interest in the program. Representatives of 10 organizations agreed to recruit experimental participants for the effectiveness study and to implement the program in their community. Seven organizations agreed to recruit control participants for the effectiveness study and wait until the end of the study's experimental phase (i.e., 12 months) to offer the program. To offer the program, organizations received "seed monies" from regional health authorities. The 12-week program costs about CAD$1,900, including material expenses and professional fees.

Among the 10 organizations in charge of implementing the program, 6 were senior community centres and 4 were community health centres. They were located in cities and suburbs characterized by a range of levels of affluence. Only 5 organizations were providing group exercises on a regular basis prior to the study. Seven of the 10 organizations established partnerships with other organizations of the community to implement the program. This allowed for a sharing of responsibilities (recruitment of participants, organization of space and material, leading group classes) between organizations.

For the effectiveness study, representatives of community-based organizations were asked to recruit community-dwelling seniors aged 60 years and over who were exempt from cognitive deficits and disabling conditions, had the required capacities to get involved in a group exercise program, and were able to speak either English or French. Representatives of community-based organizations were also

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encouraged to use key words, such as *falls*, *balance*, *strength*, *healthy bones*, and *exercises*, for their advertising, in order to recruit seniors that represented the Stand Up! target population. All study participants were informed about the research objectives and process and signed a consent form. They were also informed that data collected would remain confidential. Participants who were recruited to receive the intervention were also informed of the potential risks associated with participation in the program.

Measures

Population Reached

Information about participants was collected through a structured, face-to-face interview, 1 week prior to the beginning of the program. The questionnaire tapped into socio-demographic characteristics and other variables, such as perceived health status, which was assessed with a question from the Canadian Community Health Survey (Statistics Canada, 2000). To examine the match between recruited participants and the program's target population, data about perceived balance, falls/near falls, and fear of falling were also collected. Perceived balance was assessed with a single item dealing with one's overall perception of balance on a 10-point ordinal scale. Falls and near falls were assessed by asking participants if they had experienced falls or near falls in the previous 12 months. Fear of falling was assessed by asking participants if they were afraid of falling, using a four-category response scale (*never*, *occasionally*, *often*, and *very often*). Since the effectiveness study focused on participants' balance, a battery of balance performance tests was also administered by trained physical therapists prior to and following the program. The battery included the One-Legged Stance and Tandem Stance tests for static balance, the Functional Reach and Lateral Reach tests for stability limits, and the Tandem Walk test for mobility (Baloh et al., 1994; Brauer, Burns, & Galley, 1999; Duncan, Weiner, Chandler, & Studenski, 1990; Franchignoni, Tesio, Martino, & Ricupero, 1998).

Program Delivery

To determine the extent to which the program was delivered as recommended by program guidelines, we examined the following dimensions: (a) recruitment and selection of participants, (b) group format, (c) instructor background and leadership style, and (d) application of exercise training principles. Program delivery was examined through two assessment methods. First, a trained research assistant observed one exercise class in each organization between the 4th and 8th weeks of the program and used a checklist describing the instructor's leadership style and the instructor's reliance on the program's training principles during group exercises. Second, at the end of the program, a structured telephone interview with the coordinator and group instructor from each community-based organization was conducted by another research assistant. This interview included questions about the leader's professional background, about recruitment and selection of participants, and about group format, as well as about reliance on the program's training principles during group exercises.

Program Participation

The level of participation in Stand Up! was examined through two indicators: attendance at group exercise classes and compliance with the home exercise module. A record of participants' attendance at each class was maintained by each group instructor to allow for compilation of each participant's attendance rate. Compliance with the home exercise module was self-reported and was recorded through a structured interview with each participant conducted 1 week after the end of the program.

Data Analysis

Except for program delivery, which was analysed at the organizational level, all analyses were performed at the individual level. Descriptive statistics (mean, standard deviation, and proportions) were computed to develop a profile of participants in terms of socio-demographic characteristics, perceived health status, falls/near falls, fear of falling, and perceived balance. Individual-level data were also used to examine participation level in the program. The absolute number of organizations meeting each program guideline was used to examine organizational compliance with each program guideline.

Statistical procedures were applied to compare subgroups of participants: (a) participants who attended 75 per cent or more of the group exercises classes with those who attended fewer than 75 per cent of classes and (b) participants who practised home exercises at least once a week as suggested in the program guide with those who practised home exercises less often. Comparisons were made on a series of characteristics, including socio-demographic variables, perceived health, falls/near falls, fear of falling, perceived balance, and balance performance. Student t tests were used with continuous variables such as age, perceived balance, and balance performance. When required, transformations were performed to achieve

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normality prior to statistical testing. When transformations did not result in normal distributions, variables were categorized through a tertile split. For categorical variables, we applied χ^2 tests to examine if proportions of persons falling into each sub-group differed.

Results

Match between Population Reached and Target Population

Table 3 shows participants' characteristics at their entry into the study. Participants were heterogeneous in terms of socio-demographic and health characteristics, although most participants were women (84% of participants). Table 3 also indicates that almost 40 per cent of participants reported having experienced one or several falls in the previous 12 months and that 26 per cent of participants reported having experienced near falls in the previous 12 months. Twenty-six per cent of participants reported experiencing fear of falling often or very often, whereas 38 per cent experienced fear of falling occasionally. Only 13 per cent of participants considered their balance as weak (i.e., score < 5 on a 1 to 10-point rating scale). More than half of participants considered their balance as moderate (i.e., score of 5, 6, or 7).

Table 3: Characteristics of participants at entry into Stand Up! (*N* = 98)

Characteristics	Mean (*SD*, range) or %
Sociodemographic Characteristics	
Age	73.6 (7.4, 60–91)
Sex (female)	84%
Living Conditions (live alone)	55%
Education Level[a]	
Primary	29%
High school	42%
College/University	29%
Perceived Health Status[a]	
Poor/Average	26%
Good/Very good	57%
Excellent	17%
Criteria Defining Target Population[b]	
Falls (occurrence of one or several falls in the previous 12 months)	39%
Near Falls (occurrence of one or several near falls in the previous 12 months)[c]	26%
Fear of Falling:	
Often/Very often	26%
Occasionally	38%
Never	36%
Perceived Balance (score on a 1- to 10-point rating scale)[a]:	
Score < 5	13%
Score of 5, 6 or 7	52%
Score of 8, 9, or 10	35%

a One missing observation for these variables (*n* = 97)
b Data for falls and near falls are not mutually exclusive
c Two missing observations for this variable (*n* = 96)

Analysis of participants' characteristics at entry into the program revealed that 50 per cent of participants were seniors who met one or several of the following criteria, which define the program's core target population: (a) experienced one or several falls in the previous year, (b) experienced fear of falling often or very often, and (c) perceived their balance as weak. Another 37 per cent of participants met one or several of the following criteria, which define what could be called the program's secondary target population: (a) experienced one or several near falls in the previous 12 months, (b) were occasionally afraid of falling, and (c) perceived their balance as moderate. The remaining 13 per cent of participants did not meet any of the criteria related to the program's target population.

Match Between Program Delivery and Program Guidelines

Table 4 outlines the number of community-based organizations meeting each of the program's guidelines. In general, compliance of community-based organizations with these guidelines was good. More specifically, every organization used several recruitment strategies as recommended in program guidelines. The most frequent strategies adopted by organizations were information sessions about the program during a seniors' community activity, ads in local newspapers, and use of printed materials. Thirty-three per cent of participants reported having heard about the program through an information session during a seniors' community activity. Other participants indicated being provided information about Stand Up! through family and friends (18%), a health professional (18%), an ad in a local journal (16%), or by consulting other written material, such as a poster or a pamphlet (15%). The Capacity-for-Exercise grid was used in all community-based organizations, although a few instructors did not systematically collect the medical authorization form when required.

The size of each group of participants was also in keeping with Stand Up! guidelines. It varied from 5 to 15 participants (*mean* = 10). However, no instructor turned to a co-leader for assistance when groups included more than 10 participants. Group leaders were mostly physical therapists (*n* = 4) and physical rehabilitation technicians (*n* = 5). Other leaders included an occupational therapist and a physical

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Table 4: Number of community-based organizations meeting each program guideline

Program Guidelines	Number of Community-Based Organizations Meeting Guideline
Participant Recruitment and Selection	
Use several recruitment strategies[a]	10
Use the Capacity-for-Exercise grid[a]	10
Collect medical authorization form when required by the Capacity-for-Exercise grid[a]	7
Group Format	
Group size not exceeding 15[a]	10
Co-Leader for group size above 10[a]	None of the 6 groups over 10 used a co-leader
Leadership Background and Style	
Group led by rehabilitation or exercise professionals[a]	10
Dynamism and humour[b]	10
Positive reinforcement[b]	10
Reliance on Program's Training Principles	
Suggest variations to personalize exercises[b]	10
Gradually increase exercise intensity[a]	9 (report doing it often)
Phone absent participants to maximize attendance[a]	5 (report doing it often or always)
Encourage home practice[b]	5
Correct participants' position to prevent adverse effects during exercises with Therabands ® [b]	7

a Data collected by interview
b Data collected by observation of one group exercise class

educator. Data regarding reliance of instructors on training principles for exercises showed that the personalization of exercises was respected by every instructor. Also, most instructors respected the gradation principle for exercise intensity and corrected participants' position to prevent adverse effects. However, some instructors failed to call up absent participants or to encourage participants to practise their exercises at home.

Program Participation

The attendance records showed that, among the 98 participants, 10 dropped out of the program. Of these, 5 did so during the first 2 weeks of the program. Drop-outs did not differ from the other participants in terms of age, gender, health status, falls, or fear of falling (all p values >0.05). The average attendance rate among the participants, including drop-outs, was 78 per cent. This rate accounted for the total number of classes provided by community-based organizations, which varied between 19 and 24 sessions. The most frequent reasons reported by participants for missing a group class were a health problem (20%) or being engaged in another social or familial activity (13%).

Compliance with the home exercise module was recorded for 88 participants. At the end of the program, 79 per cent of these participants reported having practised Stand Up! home exercises at least once a week. Moreover, 55 per cent of these participants reported having practised home exercises at least twice a week.

We compared seniors who participated in a minimum of 75 per cent of group exercise classes (higher attendance sub-group) with seniors whose attendance rate was less than 75 per cent of classes (lower attendance sub-group). This cut-off point was chosen following an examination of the distribution of attendance rates and based on the minimum exposure level that was thought to be required to achieve the program's goals. Results shown in Table 5 indicate that scores on the One-Legged Stance (eyes open, left side), the One-Legged Stance (eyes closed, right and left sides), and the Functional Reach tests at entry into the program were significantly lower for participants who did not attend 75 per cent of classes, indicating a lower initial balance performance in the lower attendance sub-group. However, we did not observe any other significant differences between these sub-groups of participants in terms of perceived health, falls/near falls history, and fear of falling. It is interesting to note that a large majority of seniors (i.e., 90%) who did not attend 75 per cent of group exercise classes were compliant with the home exercise component of the program (i.e., they reported having practised home exercises at least once a week).

We also compared seniors who reported having performed the home exercise module at least once a week (compliant sub-group) with seniors who did not perform the home exercise module on a weekly basis (less compliant sub-group). We observed that seniors who were less compliant with the home exercise module had higher scores on the One-Legged Stance (eyes open, right and left sides), the One-Legged Stance (eyes closed, right side), and the Lateral Reach (right and left sides) tests at entry into the program in comparison to participants who were compliant with the home exercise module. However, most of these less compliant seniors (i.e., 89%) attended more than 75 per cent of group exercise classes. We did not observe any other significant differences between compliant and less compliant seniors' characteristics.

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Table 5: Results of statistical tests comparing sub-groups of participants on a series of characteristics

Variables	Attendance at Group Exercise Classes			Compliance with Home Exercise Module		
	Higher Attendance Mean (*SD*) or % ($n = 71$)	Lower Attendance Mean (*SD*) or % ($n = 27$)	*p* value	Compliant Mean (*SD*) or % ($n = 69$)	Non-compliant Mean (*SD*) or % ($n = 19$)	*p* value
Sociodemographic Characteristics						
Age[a]	73.3 (7.6)	74.1 (7.0)	0.65	74.1 (7.4)	71.7 (7.0)	0.22
Sex (female)[b]	82%	89%	0.39	86%	74%	0.23
Education Level[b]						
Primary	24%	42%	0.11	29%	26%	0.81
High school	42%	42%		42%	37%	
College/University	34%	15%		29%	37%	
Perceived Health:[b]						
Poor/Average	24%	30%	0.57	28%	16%	0.52
Good/Very good	56%	59%		55%	68%	
Excellent	20%	11%		17%	16%	
Fall-Related Variables						
Falls/Near falls (occurrence of one or several falls/near falls)[b]	58%	48%	0.39	59%	53%	0.60
Fear of falling (often/very often)[b]	27%	26%	0.93	30%	11%	0.08
Balance						
Perceived balance[a]	6.4 (1.9)	6.5 (2.1)	0.91	6.3 (2.0)	6.7 (1.8)	0.43
Static balance tests (s)						
One-legged stance (eyes open, R)[a]	15.6 (19.8)	10.8 (15.0)	0.20	12.6 (17.3)	24.5 (23.6)	**0.01**
One-legged stance (eyes open, L)[a]	12.9 (16.8)	6.7 (11.9)	**0.03**	10.1 (15.1)	19.4 (19.1)	**0.02**
One-legged stance (eyes closed, R)[a]	2.9 (2.0)	2.2 (1.6)	**0.05**	2.5 (1.7)	3.9 (2.5)	**0.01**
One-legged stance (eyes closed, L)[a]	3.0 (3.8)	2.0 (1.5)	**0.05**	2.8 (3.8)	2.9 (1.7)	0.46
Tandem stance[b]	31.5 (23.9)	19.0 (23.0)	0.11	24.9 (22.8)	37.5 (24.9)	0.09
Stability limits tests (cm)						
Functional reach[a]	25.3 (6.6)	21.9 (6.9)	**0.02**	24.1 (6.4)	27.1 (7.0)	0.07
Lateral reach (R)[a]	15.1 (5.2)	14.6 (5.4)	0.68	14.6 (5.1)	17.9 (5.1)	**0.02**
Lateral reach (L)[a]	14.6 (5.1)	13.0 (4.5)	0.16	13.7 (4.4)	17.2 (5.8)	**< 0.01**
Mobility Test (s)						
Tandem walking[a]	17.0 (11.8)	16.0 (5.4)	0.96	17.6 (12.0)	14.5 (6.5)	0.37

a Comparison of sub-groups based on student *t* tests
b Comparison of sub-groups based on χ^2 tests

Discussion

The objectives of this paper were to describe a multifactorial falls-prevention program (called Stand Up!) that was designed for independent community-dwelling seniors and to present the results of an analysis of the feasibility of implementing this program in community-based settings. Although there was heterogeneity across implementation contexts, community-based organizations were successful in recruiting the target population and in delivering Stand Up! according to program guidelines. In addition, attendance rates and compliance levels were in the range required to result in measurable differences in terms of balance, a major factor to consider for the prevention of falls. These data suggest that Stand Up!, can successfully be implemented in community-based organizations in urban and suburban areas.

Successful recruitment into the program may have resulted from the clear marketing message and the variety of recruitment strategies used by the community-based organizations. Furthermore, results suggest that community-dwelling seniors are able to establish the suitability of a falls-prevention program like Stand Up!, as only 18 per cent of participants were referred to the program by a health professional. Thus, the registration of a majority of seniors rested on their self-assessment of the program's appropriateness for their needs and capacities. As for the remaining 13 per cent of participants who did not meet any of the criteria related to the program's target population, they may have registered for Stand Up! for other reasons, such as socialization, general fitness, or stress relief. Such motives have been noted as reasons reported by adults for engaging in physical

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activity (Sherwood & Jeffery, 2000). Further analysis showed that these participants were more likely to participate in other activities scheduled within their community-based organization. Unfortunately, no other data were collected regarding possible motives for program enrolment. It is also interesting to note that this type of program seems to appeal to seniors of different ages, with different education levels, living conditions, and perceived health status. However, the program drew proportionately more women (84% of the sample). This proportion is above and beyond the actual proportion of women (i.e., 60%) found in the elderly population (Institut national de santé publique du Québec, 2006). This is consistent with other data showing that women are more likely to seek out preventive services than men (Bertakis, Azari, Helms, Callahan, & Robins, 2000).

Overall, the program guidelines were well followed within community-based organizations, as shown in Table 4. Many factors may have contributed to this positive result. First, the fact that Stand Up!'s content rested on evidence-based principles gave the program credibility and may have facilitated its adoption and reliable delivery by professionals. Second, the availability of a user-friendly guide, formal training, and access to professional support from the Montreal Public Health Department likely contributed to compliance with program guidelines. Third, Stand Up! was developed in partnership with community-based organizations. This allowed for the creation of a program that was realistic in terms of human and physical resources. Finally, the financial support likely acted as an incentive for reliable program delivery.

Certain elements were not applied optimally. In the future, program guidelines and instructor training should further emphasize the importance of (a) collecting medical authorization forms from seniors presenting specific risks (as detected by the Capacity-for-Exercise grid) prior to entry into the program, (b) encouraging participants to practise home exercises between group exercise classes to meet the frequency-of-exercise requirements of the program, and (c) following up with participants who missed a group exercise class. Results also show that instructors did not rely on a co-leader when groups included more than 10 participants. This may reflect that there were insufficient human resources available for acting on such a recommendation.

The average attendance rate for group sessions (78%) and the compliance levels with the home exercise module (79%) were very good, considering that there were no incentives (e.g., transport, money) for participating in the program. These results are somewhat comparable to those reported in the literature for similar programs (Jette et al., 1996; Lord & Castell, 1994). This high level of participation in the program can be attributed to several factors. First, participants' attendance maybe partially explained by their concerns about balance and falls. Second, the fact that group exercises involve a gradual increase in difficulty level, while allowing for personalization, provides an environment that is favourable to developing self-efficacy for exercise involvement (Dishman, 1994). Finally, the use of humour, the competence and dynamism of instructors, and the positive feedback from instructors and other participants are other factors that might have influenced participation rates positively (Oakley et al., 1996).

Analysis of individual factors associated with group attendance suggests that more strategies should be included in the program to enhance group participation for seniors presenting lower levels of balance. However, the fact that participants who attended fewer than 75 per cent of group exercise classes were compliant with the home exercise module suggests that the mixed approach chosen for Stand Up! (that is a group exercise component combined with a home exercise module) is appropriate. Such an approach reaches both seniors who respond more favourably to a group format and seniors who respond more favourably to an individual format for exercise practice.

Study Limitations and Future Directions for Research

Findings from the present investigation suggest that Stand Up! is a community falls-prevention program that can be successfully implemented in community-based settings in urban and suburban areas. However, findings must be interpreted with caution due to certain study limitations. One limitation is that several analyses relied on self-reported data, such as data reported by instructors regarding program delivery and data reported by participants regarding frequency of home exercise practice. These self-reported data may have been biased due to the social desirability of some responses. Another limitation is the small number of units of analysis involved in the study (i.e., 10 community-based organizations). Finally, it is important to mention that results regarding program reach and delivery as well as participation in the program could be biased positively toward the program, since analyses involved data collected during a study about the program's effects. Instructors and participants were probably highly motivated because they were part of such a study.

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Future studies should examine whether the program can be successfully implemented and maintained under varying conditions of support (financial, technical, and training) and in more heterogeneous, community-based organizations in terms of geographical, cultural, and economic characteristics. Such studies are essential to understand what contextual factors contribute to or hinder program implementation and sustainability in community settings (Prohaska et al., 2006).

As shown in Table 1, other studies related to the evaluation of Stand Up! are currently part of the research team's agenda. These studies focus on examining the impact of the program on outcomes such as balance confidence, involvement in physical activity after the program, maintenance of effects in terms of balance performance after the program, and reduction of falls incidence.

The Future of Stand Up! in Quebec

In 2003, the Quebec Ministry of Health identified strategies that should be promoted regarding falls prevention among seniors (Ministère de la Santé et des Services sociaux, 2003). To operationalize these strategies, an Advisory Committee was mandated to formulate recommendations to the Ministry of Health. These recommendations can be found in a recent publication available at http://www.msss.gouv.qc.ca (Direction générale de la santé publique, 2004). Among its recommendations, the Advisory Committee suggests that an intervention, such as Stand Up!, addressing multiple risks of falls should be offered by community-based organizations to independent-living seniors who are presenting some level of risk (e.g., seniors who have fallen in the previous year and/or seniors who are concerned about falls or their balance). In keeping with this recommendation, Quebec's National Institute of Public Health is currently working on the training of professionals to facilitate the implementation of Stand Up! across the province.

Conclusion

Recognizing the pivotal role of context in implementing health-related programs, the present investigation supports the idea that multifactorial falls-prevention programs including exercise and educational components can be successfully offered in community-based settings. Furthermore, this paper exemplifies the fulfilment of recent recommendations that researchers should not only report results regarding program impact but should also provide evidence of program reach and delivery and of level of participation (Des Jarlais, Lyles, & Crepaz, 2004; Glasgow et al., 2003). Such information is essential to address the issue of the feasibility of broader program implementation, to inform researchers about the generalizability of results, and to support "clinicians, health directors, and decision-makers responsible for selecting prevention and health promotion programs" (Glasgow et al., 2003, p. 1266).

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