Feasibility of Interdisciplinary Community-Based Fall Risk Screening

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KEY WORDS
- accident prevention
- accidental falls
- adaptation, psychological
- community health services
- postural balance
- risk

OBJECTIVE. This pilot study examined the feasibility of (1) conducting interdisciplinary fall risk screens at a communitywide adult fall prevention event and (2) collecting preliminary follow-up data from people screened at the event about balance confidence and home and activity modifications made after receiving educational information at the event.

METHOD. We conducted a pilot study with pre– and posttesting (4-mo follow-up) with 35 community-dwelling adults ≥55 yr old.

RESULTS. Approximately half the participants were at risk for falls. Most participants who anticipated making environmental or activity changes to reduce fall risk initiated changes (n = 8/11; 72.7%) during the 4-mo follow-up period. We found no significant difference in participants' balance confidence between baseline (median = 62.81) and follow-up (median = 64.06) as measured by the Activities-specific Balance Confidence scale.

CONCLUSION. Conducting interdisciplinary fall risk screens at an adult fall prevention event is feasible and can facilitate environmental and behavior changes to reduce fall risk.

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The U.S. population is aging. By the year 2030, approximately 19.3% of the population will be ages 65 yr or older (Administration on Aging, 2011). Falls are a major health concern because they commonly cause serious injury or death (Centers for Disease Control and Prevention [CDC], 2011), are multifactorial (American Geriatrics Society [AGS] & British Geriatrics Society [BGS], 2010), and occur among 1 in 3 adults ages 65 and older annually (National Council on Aging, 2011).

Early identification of fall risk by means of a multifactorial fall risk assessment that examines typical risk factors is key to limiting future falls and fall-related injuries, death, and institutionalization (AGS & BGS, 2010). In the United States, fall risk screening, assessment, and intervention often occur after a fall when the person enters the health care system for treatment of fall-related injuries. Although the AGS and BGS (2010) guidelines recommend that physicians screen for falls annually, health care professionals should be aware that older adults may not freely report their falls because of embarrassment, fear of losing their independence, or the misperception that falls are a normal part of aging (Hanson, Salmoni, & Doyle, 2009; Soriano, DeCherrie, & Thomas, 2007). Therefore, to identify older adults at risk of falling before they enter the health care system with a fall-related injury, communities may need additional avenues for early detection and prevention to complement existing clinical interventions.

Research documenting successful community-based fall risk screens or fall prevention education at health fairs is limited. Past studies examining the feasibility

and efficacy of fall risk screens at health fairs did not measure all the multiple factors involved in fall risk and involved only one discipline (e.g., physical therapy; Ness, Gurney, & Ice, 2003; Ness, Gurney, & Ishani, 2001; Ness, Gurney, Wall, Olsen, & Boergerhoff, 2004).

The study described in this article involved a pilot study to examine the feasibility of (1) conducting interdisciplinary fall risk screens at a communitywide adult fall prevention event and (2) collecting preliminary follow-up data about the balance confidence of adults screened at the event and home or activity modifications they made after receiving educational information at the event. We identified no studies that investigated the feasibility of multiple disciplines collaborating to address the multifactorial nature of falls during a communitywide fall prevention event. To meet the AGS and BGS (2010) guidelines for multifactorial fall risk identification among community-living older adults, clinicians need to explore creative strategies to conduct community-based fall risk screenings and education.

Method

Research Design and Data Collection

We used a pretest–posttest design to collect baseline data (i.e., fall risk screening, balance confidence, and questionnaire) during a 3-hr interdisciplinary fall prevention expo and follow-up data at 4 mo. At the expo, participants agreed to have researchers make a copy of their fall risk and balance confidence screenings and voluntarily submitted their baseline questionnaire for data analysis. The follow-up balance confidence scale and questionnaire were mailed to participants 4 mo after the expo. Sharon J. Elliott and volunteers who were trained in using the instruments and procedures collected the data.

The expo was developed as an outreach of the SPICE for Life program (Senior Safety, Prevention, Intervention, Community-based Education fall prevention program; Painter & Elliott, 2004) in collaboration with state and local fall prevention coalitions, the local Council on Aging, health care professionals, and health care students. It was designed for adults ≥55 yr old who were interested in learning about falls and fall prevention and identifying their fall risk. The expo was advertised through the media and flyers were posted in the community.

We assessed the feasibility of offering effective fall prevention education at an event of this type by examining the following data: (1) participants' scores on an interdisciplinary fall risk screen, (2) participants' baseline and follow-up scores on a balance confidence scale, (3) participants' responses to a questionnaire about anticipated home and activity modifications, and (4) completed home and activity modifications made after receiving educational information and screenings at the expo. The institutional review board of the University of Indianapolis approved this study, and all participants provided consent (participants screened for fall risk provided consent in writing; other participants provided verbal consent).

Participants

Study participants were recruited from a convenience sample of community-dwelling adults ≥55 yr old who attended the expo. Study inclusion criteria required attendance at the expo and consent for study participation. Adults who were cognitively unable to provide consent or who declined participation were excluded from the study.

Fall Prevention Expo Program Elements

The expo included four primary elements: (1) fall prevention education, (2) an interdisciplinary fall risk screen, (3) a balance confidence screen, and (4) a baseline questionnaire. All elements were available to all attendees and were not limited to those who consented to study participation. The expo educational intervention included viewing and discussing a DVD with fall prevention experts; this DVD presented statistics on the magnitude of the issue and a discussion of fall risk factors, home modifications, safety equipment, medication review, exercise, vision screening, and safe footwear (Home Safety Council, 2004). Participants also had the opportunity to interact with vendors who provided information about many areas of fall prevention, including rehabilitation services, emergency calling systems, durable medical equipment, exercise programs, low vision and falls, and medications and fall risk.

Volunteer screeners from various health care disciplines worked collectively to complete one tool, an interdisciplinary fall risk screen (a modified version of the Falls Risk for Older People: Community Setting [FROP–Com]; National Ageing Research Institute [NARI] & Melbourne Extended Care and Rehabilitation Service [MECRS], 2008; Russell, Hill, Blackberry, Day, & Dharmage, 2008), rather than using multiple discipline-specific assessments. Using the FROP–Com, occupational therapy screeners interviewed participants about fall history, home environment, daily living tasks, and functioning. Physical therapy screeners assessed balance and gait and interviewed attendees about physical activity levels. Emergency medical technicians and nurses used interviews, screenings, and clinical observation to obtain fall-related medical history, including foot and leg

sensation, cognition, continence, nutrition, and feet and footwear. Vision technicians conducted visual screenings, and pharmacy screeners reviewed medications in relation to fall risk. All screeners used the scoring and recommendation guidelines accompanying the FROP–Com (Russell et al., 2008).

Attendees completed the Activities-specific Balance Confidence (ABC) scale (Powell & Myers, 1995) with the occupational therapy screeners. Each person's fall risk and balance confidence screens lasted about 50 min. The screeners tabulated the scores on the FROP–Com and the ABC scale and encouraged attendees to review results with their physician and obtain one or more referrals for services, if appropriate. Finally, before leaving the expo, attendees who had provided consent completed and returned a questionnaire that listed their anticipated home and activity modifications to reduce their fall risk. Participants also turned in copies of their screenings at this time. Four months after the expo, participants who had received both screenings were mailed a follow-up ABC scale and follow-up anticipated modifications questionnaire to complete and return in a self-addressed stamped envelope.

Instruments

We used two standardized screening tools, the modified FROP–Com to identify participants' individual fall risk factors and the ABC scale to assess their balance confidence related to functional tasks. The FROP–Com is a multifactorial screening that identifies 13 types of fall risk factors among community-living older adults and has good intrarater reliability (.93) and interrater reliability (.81; NARI & MECRS, 2008; Russell et al., 2008). FROP–Com scores indicate whether a person's fall risk is low (0–15 points), mild to moderate (16–24 points), or high (>24 points) and can be used to guide recommendations for intervention or referral to other health care professionals (NARI & MECRS, 2008). Sharon J. Elliott modified the FROP–Com to omit the home safety assessment (because of time constraints) and to enable different disciplines to complete specific sections of the tool.

Participants used the ABC scale to self-report balance confidence (from 0%, *no confidence,* to 100%, *completely confident,* in 10% increments) when completing 16 functional tasks (e.g., using the stairs, reaching items overhead; Myers, Fletcher, Myers, & Sherk, 1998; Powell & Myers, 1995). This tool has an internal consistency reliability of .95 using Cronbach's α (Talley, Wyman, & Gross, 2008), good test–retest reliability (.92), and good criterion validity (Powell & Myers, 1995). Screeners calculated an average ABC score; lower scores are associated with less confidence in one's balance when performing tasks (Powell & Myers, 1995). A score of <67% indicates a person is at risk for falls, and a score of ≤80% implies that intervention may be necessary to improve balance confidence (Lajoie & Gallagher, 2004; Myers et al., 1998). This study used the revised scale with 10% increments rather than a continuous 0%–100% scale because the continuous scale has been criticized as difficult for older adults to use (Myers, 1999). A baseline questionnaire was used to gather demographic data and the number of falls in the past year (Table 1). Participants reported whether they planned to visit their physician after attending the expo to discuss their fall risk and delineated their anticipated home environment or activity changes resulting from the educational information and screenings received at the event (Table 2). The follow-up questionnaire administered 4 mo after the expo asked participants whether they had visited their physician to discuss their fall risk and made any home environment or activity modifications since attending the expo. A member of the study team was available to answer participants' questions about either questionnaire.

Data Analysis

Descriptive statistics and tests of significance using IBM SPSS Statistics 19.0 (IBM, Armonk, NY) were used. Comparison of pretest and posttest ABC scale scores was performed using the Wilcoxon signed-ranks test, and $p < .05$ was considered statistically significant.

Results

Fifty-one of the 60 adults who attended the expo consented to participate in the study. Figure 1 depicts the starting sample of attendees and the participant flow resulting in the final sample of participants with follow-up information ($n = 11$). Table 1 presents participants' baseline characteristics.

Fall Risk Screens

Of the 20 participants who completed the screenings (modified FROP–Com and ABC scale), 12 were identified as being at mild to high fall risk on the basis of FROP–Com scores, and 10 were identified as at risk for falls on the basis of ABC scale scores of <67% (Lajoie & Gallagher, 2004). Seven participants were identified as being at risk by both the FROP–Com and the ABC scale. The most commonly identified fall risk factors using the FROP–Com at baseline included the number and type of

Table 1. Participants' Baseline Characteristics

Characteristic	All Participants ($N = 35$)		Participants Who Completed the Modified FROP–Com and ABC ($n = 20$[a])	
	n	%	*n*	%
Gender				
Male	5	15.6	1	5.6
Female	27	84.4	17	94.4
Missing gender	3		1	
Race				
White	17	60.7	7	46.7
African-American	10	35.7	7	46.7
Asian	1	3.6	1	6.7
Missing race	7		4	
Lives alone or with others				
Lives alone	14	48.3	10	62.5
Lives with others	15	51.7	6	37.5
Missing lives alone or with others	6		3	
Age, yr				
55–64	7	21.9	2	11.8
65–74	11	34.4	9	52.9
75–84	10	31.3	4	23.5
85+	4	12.5	2	11.8
Missing age	3		2	
Prior falls				
No prior falls	11	33.3	7	41.2
1 prior fall	10	30.3	3	17.6
2+ prior falls	12	36.4	7	41.2
Missing prior falls	2		2	

Note. ABC = Activities-specific Balance Confidence scale; FROP–Com = Falls Risk for Older People: Community Setting.
[a]One participant elected not to complete the baseline characteristics information.

medications; gait, physical activity, and balance skills; and foot impairments and unsafe footwear.

Balance Confidence and Home and Activity Modifications

Baseline and Follow-Up ABC Scale Scores. Twenty participants completed the baseline ABC scale. These participants scored the lowest on the ABC (i.e., less confidence in their balance) for walking on icy sidewalks, standing on chairs and reaching, and stepping on and off escalators while holding packages. They scored the highest (i.e., more confidence in their balance) for obtaining a can from a shelf, walking around the house or to the car, and getting into and out of a car. Respondents' median ABC score was 66.56, and score range was 16.25–99.38. Twelve participants completed both the baseline and 4-mo follow-up ABC scale. Follow-up ABC scale results indicated that 8 people were at risk for falls, 1 more than at baseline ($n = 7$). The distribution of ABC scores was similar at baseline and follow-up (Wilcoxon $z = -1.216$, $p = .224$). The median score (64.06) and range (20.63–93.75) on the follow-up ABC scale were similar to those at baseline (median = 62.81; range = 16.25–97.50). Again, a score <67% indicates a person is at risk for falls, and a score of ≤80% indicates intervention may be necessary to improve balance confidence (Lajoie & Gallagher, 2004; Myers et al., 1998).

Baseline and Follow-Up Questionnaire. Of the 35 participants who completed the baseline questionnaire, 20 also completed the fall risk and balance confidence screenings (FROP–Com and ABC scale). Among those 20 participants, a greater proportion anticipated discussing their fall risk with their physician ($n = 18$, 90%) and making environmental changes to reduce fall risk ($n = 15$, 75%) than among the 15 participants who did not complete the screenings ($n = 10$, 66.7%; $n = 8$, 53.3%, respectively). Most of the participants who were screened and completed the follow-up questionnaire ($n = 8/11$, 72.7%) made changes to reduce their fall risk. The number of anticipated environmental changes was similar between screened and unscreened participants (0–3). The proportion of participants who anticipated making activity changes was similar among those who received a screening ($n = 13/20$, 65.0%) and those who did not ($n = 10/15$, 66.7%). However, participants who completed both screenings identified a higher range of anticipated changes (0–3) than those who did not receive screenings (0–1).

Eleven participants completed the modified FROP–Com, baseline and follow-up ABC scales, and the baseline

Table 2. Anticipated and Completed Home Environment and Activity Changes of Participants Who Received Fall Risk Screenings ($N = 11$)

Baseline: Anticipated Changes[a]		Follow-Up: Completed Changes[b]	
Response	Anticipated Changes	Response	Completed Changes
Environmental Changes			
Yes ($n = 8$)	• Increase lighting • Remove clutter • Add railing or grab bar • Purchase tub seat • Obtain emergency response system	Yes, made at least one change ($n = 6$) No changes made ($n = 2$)	• Increased lighting • Removed clutter • Added railing or grab bar • Removed or secured scatter rugs • Moved furniture and items for easier access
No ($n = 2$)	None	Yes, made at least one change ($n = 1$) No changes made ($n = 1$)	Used a stool to reach above the waist
Already made change ($n = 1$)	None	No changes made ($n = 1$)	None
Activity Changes			
Yes ($n = 7$)	• Change footwear. • Exercise more. • Be more cautious. • Increase awareness of environment. • Take breaks when tired. • Use stair rails.	Yes, made at least one change ($n = 7$)	• Changed footwear • Exercised more • Was more careful on stairs • Participated in Matter of Balance program • Used reacher to obtain items • Used cane • Had vision checked • Stayed away from crowded places
No ($n = 3$)	None	No changes made ($n = 3$)	None
Already made changes to make home safer ($n = 1$)	None	Yes, made at least one change ($n = 1$)	

[a]Baseline questionnaire questions: Do you expect to make changes to reduce your fall risk? What changes do you think you will make in your home environment to reduce your fall risk? What changes in your daily activities do you think you will make to reduce your risk of falling? (Please describe.)
[b]Follow-up questionnaire questions: Did you make any changes to reduce your fall risk? What changes did you make in your home environment to reduce your fall risk? What changes in your daily activities did you make to reduce your risk of falling? (Please describe.)

and follow-up questionnaires. Nine of the 11 participants (81.8%) anticipated talking to their physician at baseline, and 5 followed through (45.5%). Most people who anticipated making environmental or activity modifications followed through and made changes to reduce their fall risk (Table 2).

Discussion and Implications for Practice

This pilot study demonstrated preliminary evidence that conducting interdisciplinary fall risk screens at a community-based fall prevention event, such as an expo, is feasible and efficient, can facilitate environmental and activity changes to reduce fall risk, and can add to the limited knowledge on this topic (Ness et al., 2001, 2003, 2004). We recommend several procedural changes to enhance the study's replicability and utility. To maximize data collection and minimize attrition, researchers can offer participants an incentive (e.g., monetary or other gift) and ensure that they understand the benefits of study participation. Offering free transportation or travel reimbursement and obtaining prior informed consent to decrease participants' time commitment at the event may decrease the burden of participation (Mody et al., 2008). Researchers should train volunteer screeners in completing the data collection forms accurately, reviewing the forms before collecting them, and collecting the forms as they are completed to minimize missing data.

Another suggested procedural change is to add monthly follow-up recording of fall incidents by participants who received and did not receive the risk screenings for 1 yr to help enhance participants' reporting accuracy (Ganz, Higashi, & Rubenstein, 2005) and identify changes in fall frequency after attendance at an educational fall

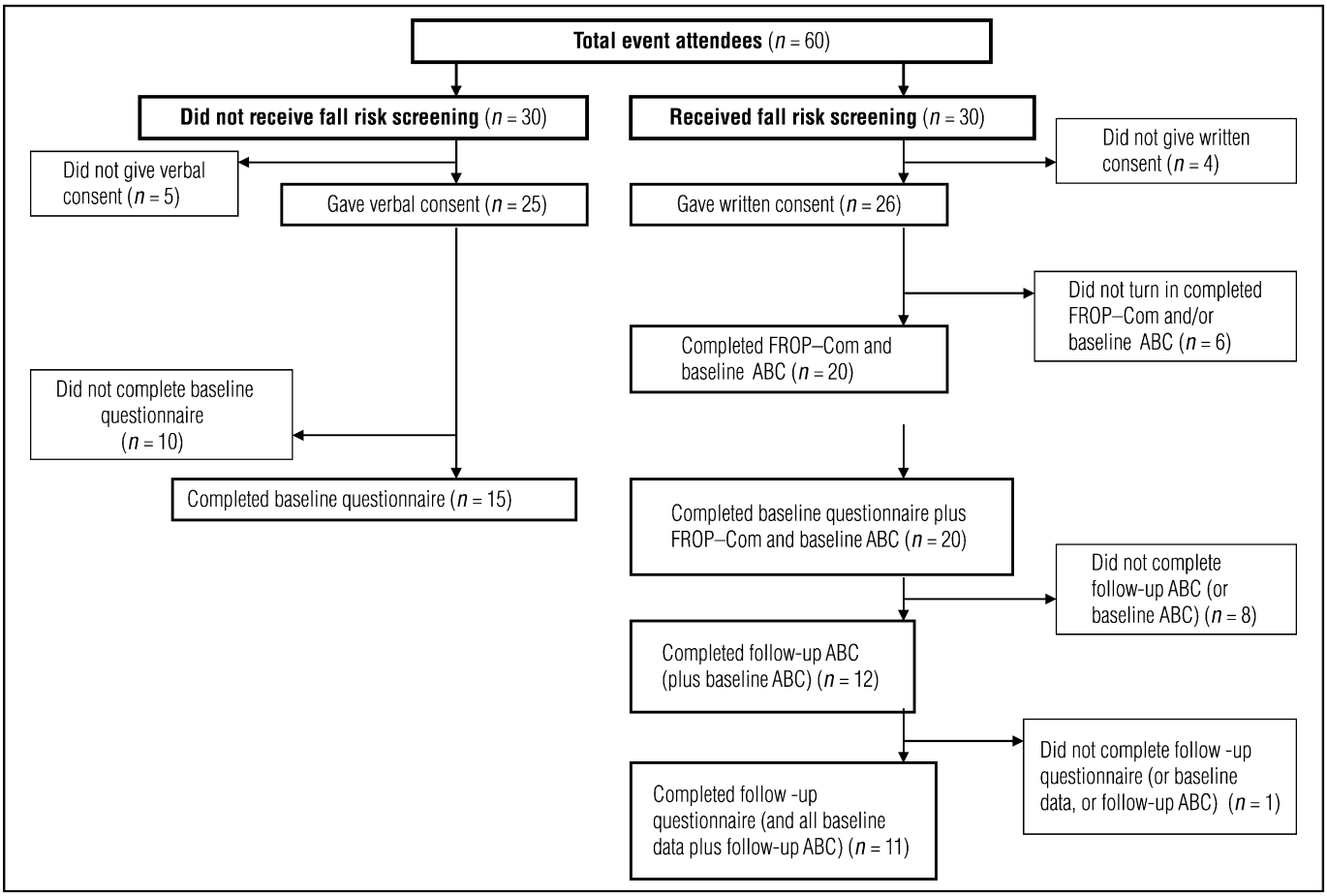

Figure 1. Participant flow chart.

Note. ABC = Activities-specific Balance Confidence scale; FROP–Com = Falls Risk for Older People: Community Setting.

prevention expo. Providing participants with a copy of their anticipated home environment and activity changes at the expo may reduce unintended discrepancies between anticipated and completed changes to reduce fall risk. To increase the accuracy of self-reported changes made during the 4-mo follow-up, researchers could ask participants to use a journal to record completed home environment or activity modifications as they occur. Additionally, steps to promote the interrater reliability of screeners may improve data collection accuracy.

The preliminary data gathered in this pilot study demonstrate that the expo participants who completed the baseline and follow-up questionnaires followed through and made changes to their home environment or activities after attending the expo. ABC balance confidence scores, however, were similar at the event and at follow-up.

Use of the modified FROP–Com to determine fall risk factors provided local organizations with information about needed community resources to identify and reduce fall risk. For example, the local Council on Aging now provides balance screenings conducted by occupational and physical therapists. Determining participants' balance confidence using the ABC scale may help screeners identify which people can appropriately be referred to evidence-based community programs such as Matter of Balance (Tennstedt et al., 1998) to reduce fear of falling.

In summary, the preliminary evidence of this pilot study has the following implications for occupational therapy practice:

- Conducting interdisciplinary fall risk screens at a community-based fall prevention event is feasible and efficient.
- Holding a communitywide fall prevention event can facilitate environmental and activity changes to reduce fall risk.
- Gathering fall risk statistics from participants at this type of event can inform the community about needed fall prevention resources.

Limitations

The effects observed in a convenience sample cannot be generalized to the entire population of community-dwelling adults. The small sample size and variable response rates call into question the veracity of the observed effects. Moreover, participants may have inaccurately recalled the number of fall events and home or activity modifications when completing the baseline and follow-

up questionnaires, an inherent limitation in self-reported recall over the past year (Ganz et al., 2005; Mackenzie, Byles, & D'Este, 2006) that could have weakened the findings. Interrater reliability was not established for the tools, which may have affected the study results.

Future Research

A randomized controlled trial comparing participants who received and did not receive a fall risk screening or fall prevention education, or both, with a control group would help identify differences in completed home and activity modifications between these groups. Further empirical research using different fall risk screening instruments could help health care professionals determine the most appropriate screening tools to use with different client populations. Comparing single- and multiple-discipline fall risk screenings would shed light on the efficacy of these different strategies. It could also be beneficial to investigate the prevalence and severity of a variety of fall risk factors identified during the fall risk screenings.

In summary, given the study's results, occupational therapy clinicians should proactively explore the feasibility of developing and implementing similar community-wide events, which may lead to more targeted community resources, assessments, and interventions to reduce fall risk. ▲

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