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Facilitators and barriers to enrolling in falls prevention programming among community dwelling older adults

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ABSTRACT

The purpose of this cross-sectional survey study was to identify factors that increase the likelihood of enrolling in falls prevention programming among community dwelling older adults. A convenience sample of 369 participants completed a written, selfadministered questionnaire on history and beliefs related to falls, and facilitators and barriers associated with enrollment. History of falling, fear of falling, self-efficacy, and recognition of program benefits were all associated with a greatly likelihood to enroll in falls prevention programming. Additionally, seven facilitators were associated with greater likelihood to enroll, including offered close to home (OR = 6.75(3.829–11.898); p = 0.000), free vision screen (OR = 4.816 (1.442–16.084); p = 0.005), friendly leader (OR = 3.930 (2.049–7.538); p = 0.000), coffee hour to socialize (OR = 3.789 (1.309–10.971); p = 0.009), no cost (OR = 3.653 (2.125–6.253); p = 0.000), group exercise (OR = 2.584 (1.341–4.980); p = 0.004), and safe place (OR = 2.378 (1.181–4.789); p = 0.013). Physician advice to attend a program, however, was not associated with likelihood to register (p = 0.99), supporting the need for a paradigm shift from physicians serving as the key change-agent in falls prevention to multiple partnerships. In addition, although 72% of participants were likely to register for a falls prevention program, only 28% knew if a program was being offered in their community. These findings highlight a critical need to disseminate information about falls prevention programming through social marketing in locations where older adults go in their everyday lives.

1. Introduction

Falls among older adults are a significant public health issue. They are the leading cause of fatal and non-fatal injuries among people age 65 and above. According to the Centers for Disease Control and Prevention (CDCP), one out of three people aged 65 and older fall every year, and the number of deaths from falls among those over the age of 65 has nearly doubled over the past 10 years in the United States (US) (CDCP, 2016a, 2016b). Unintentional injuries are the fourth leading cause of death in the US following cardiovascular disease, cancer, and pulmonary disease, and falls are a leading cause of unintentional injuries (CDCP, 2016a, 2016b). In 2012, there were 3.2 million non-fatal fall related injuries in the US requiring medical treatment costing the health care system $30.3 billion, as well as 24,190 fatal falls which cost $616.5 million to treat (Burns, Stevens, & Lee, 2016). The financial burden from falls among older adults is expected to rise to $67.7 billion by the year 2020, due to the fact that the fastest growing segment of the U.S.'s population is over the age of 65 (Nation Council On Aging, 2014). In addition to staggering health care costs, falls negatively affect quality of life for older adults and can burden caregivers.

Over the past three decades, reducing morbidity and mortality associated with older adult falls, as well as reducing the burden of the health care costs related to falls, has been a public health priority. Much of the research in falls prevention to date has focused on identifying optimal intervention programs for modifying fall risk factors including muscle weakness, reduced balance, home hazards and psychoactive medications. Interdisciplinary programs addressing these modifiable risk factors have been shown to reduce fall risk and injuries from falls (El-Khoury, Cassou, Charles, & Dargent-Molina, 2013; Rubenstein, 2006; Sherrington, Tiedemann, Fairhall, Close, & Lord, 2011; Stevens & Burns, 2015). Hence, there has been a proliferation of evidence-based falls prevention programs offered to community dwelling seniors in the US, including Tai Ji Quan: Moving for Better Balance, Otago, Matter of Balance, and Stepping On, as well as others (Stevens & Burns, 2015).

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In spite of increased funding and availability, the literature widely reports that: 1) most seniors do not receive information from their health care providers about reducing their fall risk, 2) seniors are not routinely screened for fall risk even after being seen for medical care due to an actual fall, and 3) there are very low referral rates to falls prevention programs (Coe et al., 2017; Jones, Ghosh, Horn, Smith, & Vogt, 2011; Shubert, Smith, Prizer, & Ory, 2013; Stevens, Sleet, & Rubenstein, 2018). Additionally, many seniors do not participate in falls prevention programs even after referrals are made, and most programs are under-enrolled by 50% or more (Coe et al., 2017). These enrollment rates are consistent with the literature on participation in other evidence-based health promotion programs (Horrell & Kneipp, 2017; Shawley-Brzoska & Misra, 2018; Smith et al., 2018).

Few published research studies conducted within the US have examined older adults' beliefs about falls and their preferences for falls prevention programs. These beliefs and program preferences greatly influence seniors' decisions to enroll in falls prevention programs (Laing, Silver, York, & Phelan, 2011; McInnes & Askie, 2004; Stevens, Sleet and Rubenstein, 2018). To increase access, enrollment and regular participation in falls prevention programs, public health administrators and health care policy makers should consider the attitudes and beliefs of older adults in the development and delivery of these vital programs. By assessing factors that older adults identify as facilitators and barriers to participation, measures can be taken to minimize obstacles and increase enrollment and participation. To have an impact on this growing public health crisis, it is a public health imperative that we not only offer effective evidence-based falls prevention programs to community dwelling seniors, but also increase participation rates.

Previous studies examining self-reported barriers and facilitators of participation in falls prevention programs among community dwelling older adults have been conducted primarily in countries outside of the US (Dickinson et al., 2011; Hill, Day, & Haines, 2014; Hughes et al., 2008; McInnes & Askie, 2004). Common barriers reported in these studies include accessibility, fatalism, low self-efficacy, illness, denial, under estimation of fall risk, embarrassment or social stigma, fear of pain with exercise, lack of transportation, sedentary habits, and inconvenience. Common facilitators include programs that address individual needs or specific benefits such as improvements in balance, strength, and independence, as well as health care provider or peer advice to participate (Bunn, Dickinson, Barnett-Page, McInnes, & Horton, 2008; Dickinson et al., 2011; Yardley, Donovan-Hall, Francis, & Todd, 2006, 2007). In addition, research evidence suggests that focusing on addressing self-efficacy and activity changes may increase participation in fall prevention programs (McInnes & Askie, 2004; Yardley et al., 2007). One qualitative study conducted in the US in Washington State found that one-third of the 101 subjects reported falls to be among their least important concerns in the health arena, even though nearly half had experienced a fall in the past 12 months (Laing et al., 2011). The participants explained that the primary barrier to participating in falls prevention practices was feeling their risk of falling was not high.

Similar to findings on enrollment for falls prevention programs, results of studies on physical activity among older adults have cited poor health as a primary barrier (Macera, Cavanaugh, & Bellettiere, 2017). Additional barriers reported include fear of falling or injury, symptoms of depression, lack of time, environmental barriers and lack of interest in being active. Olanrewaju, Kelly, Cowan, Brayne, and Lafortune (2016) also identified health status as a primary barrier. In addition, they cited previous habits, low self-efficacy, time, access, and finance, perceived value of physical activity, and environment as key barriers, and enjoyment, personal challenge, social support, effective communication, information, access and convenient scheduling as key facilitators. Two of the studies in their systematic review included referral from a healthcare professional, especially a doctor, as a facilitator (Olanrewaju et al., 2016).

Table 1
Demographics, Fall History and Beliefs Related to Falls.

Characteristic	n	% Respondents
Age Range		
60–64 years old	21	56%
65–69 years old	64	177%
70–74 years old	61	17%
75–79 years old	76	21%
80–84 years old	79	22%
85–89 years old	40	11%
90 years or older	24	7%
Gender		
Female	275	75%
Male	91	25%
Number of falls in past three months		
None	293	81%
One	43	12%
Two	18	5%
Three	8	2%
Four	0	%
Five	0	0%
Six	2	1%
How fearful are you of falling?		
Not at all	88	24%
A little	147	40%
Somewhat	89	24%
A lot	41	11%
Do you believe a fall would reduce the quality of your life?		
Strongly Agree	92	26%
Agree	193	54%
Disagree	48	14%
Strongly Disagree	23	7%
Do You Believe there are things you could do to reduce risk of a fall?		
Very likely	135	38%
Somewhat likely	149	42%
Unlikely	52	15%
Not likely at all	23	6%

The purpose of this study was, therefore, to identify factors that potentially increase the likelihood of enrollment in falls prevention programming among community dwelling older adults. Findings from this study may then be tested for enhanced recruitment for falls prevention programming.

2. Materials and methods

2.1. Design

A cross-sectional survey study was conducted to gather data on factors that older adults dwelling in the community view as potentially facilitating or hindering participation in falls prevention programming. Individual participant demographics, history of falls, and beliefs related to falls were also collected (Table 1).

2.2. Participants and recruitment

A convenience sample of 369 participants, ranging from 60 to 101 years of age, were recruited from 16 senior centers and health care provider sites across the state of New Hampshire (Table 2). Data were collected between October and November 2016, from mostly rural areas with a primarily white, non-Hispanic or Latino population base. The largest town had a population of approximately 43,000 people and

Table 2
Administration Sites Data.

Administration Site within each Town	# of Surveys per Site	Town Population[a]	% of Persons 65 and Older[a]	% White, Not Hispanic or Latino[a]	% Persons 65 or older with Income below Poverty Level[b]
Hospital Outpatient Clinic Visiting Nurse Association Senior Center	2 18 34	42,695	13.8%	90.5%	6.7%
Senior Center	19	5,250	16.9%	97.5%	7.6%
Hospital Outpatient Clinic Senior Center	24 113	23,409	14.7%	94.3%	11.2%
Community Recreation Center	1	2,301	19.6%	96.8%	1.1%
Hospital Volunteer Program	31	4,397	30.7%	95.4%	1.0%
Senior Center	11	4,106	11.5%	95.5%	4.8%
Senior Center	19	5,379	13.0%	94.8%	6.5%
Senior Center	14	15,951	18.1%	93.5%	6.3%
Senior Center	18	8,477	15.1%	95.2%	9.1%
Senior Center	12	7,356	13.5%	96.1%	5.6%
Senior Center	26	1,650	13.2%	96.5%	4.1%
Senior Center	15	3,567	20.0%	95.5%	6.6%
Meals on Wheels	32	400,721[c]	11.9%	87.6%	6.1%

[a] Source: U.S. Census Bureau, 2010 Census.
[b] Source: U.S. Census Bureau, 2012–2016 American Community Survey 5-Year Estimates.
[c] Represents County rather than Town.

the smallest approximately 1600. Survey administration sites were chosen because of their access to community dwelling older adults. There were three inclusion criteria: 1) 60 years of age or older, 2) reside in the community, and 3) read and write English in order to complete the survey. Participation was voluntary, and the survey was completed anonymously.

2.3. Survey instrument and administration procedure

The original survey instrument was developed by the first author and piloted with a small group (n = 21) of older community dwelling adults in the Boston-area the year prior to this study. Its construct was based on the health belief model, which is used in health promotion planning to better understand the factors associated with participation in evidence-based programs. The questionnaire gathered data on individual factors as well as the perceived barriers and facilitators associated with the likelihood of registering for a falls prevention program. Barriers and facilitators included in the survey were based on findings of published international studies available at this time since US data was scarce (Bunn et al., 2008; Dickinson et al., 2011; Hill et al., 2014; Hughes et al., 2008; McInnes & Askie, 2004; Yardley et al., 2006, 2007). Pilot findings supported the feasibility of using this written, self-administered questionnaire with older community dwelling adults. Participants completed the survey without asking clarifying questions in approximately five minutes, and results of the pilot study were presented at a national conference (Kiami, Wong, & Beguerie, 2017).

The version of the survey used in this study, similar to the original, included facilitators and barriers associated with registering for a falls prevention program, demographics, history of falling, fall risk beliefs, physician communication, and beliefs about the impact of a fall on their quality of life. Additionally, four questions were added to this version to elucidate the impact of fear of falling, self-efficacy (the belief that the individual can prevent or reduce fall risk), and knowledge of falls preventions programs in their community on the likelihood of registering for a program taking into consideration all of the factors addressed in the survey (see Appendix 1).

The New Hampshire Community Falls Prevention project worked collaboratively with the New Hampshire Falls Risk Reduction Task Force to identify organizations willing to participate as data collection sites. Data collectors were given copies of the survey to administer in their settings. Some data collectors sought volunteers to complete the survey during communal meals or other communal activities, while others left copies in waiting rooms for individuals to complete and return to their health care provider if they were willing to participate. All were completed by respondents themselves with little to no direction or interpretation, and no surveys were completed via verbal report. In accordance with national guidelines, the Institutional Review Board granted the study an exempt research category given that the survey was voluntary, anonymous, and identified at the lowest level of risk to participants. Completed surveys were returned to the New Hampshire Community Falls Prevention project members for data entry.

2.4. Statistical analysis

Data were entered into Excel spreadsheets, coded, and then exported to IBM SPSS Statistics 23 software program for analysis. Descriptive statistics were used to calculate response rates to survey questions. Percentages reported represent the number of participants who chose each answer as a proportion of the total number of participants responding to that particular question. Likewise, percentages for

likelihood to register for a falls prevention program represent the number of participants for a particular factor that reported to be likely to register as a proportion of the total number of participants responding to that question.

In addition, chi-square analyses were utilized to assess the significance of proportional differences between factors. To enhance intelligibility and minimize respondent ambiguity inherent when using Likert scales, data related to history of falls and beliefs were collapsed to create binary groups as follows: 1) no history of falling in the past three months versus one or more reported falls, 2) fear of falling reported as "not at all" versus any of the other three levels of fear including "a little," "somewhat," or "a lot," 3) falling harmful reported as "strongly agree" or "agree" that a fall would reduce your quality of life versus "disagree" or "strongly disagree, and 4) self-efficacy reported as "very likely" or "somewhat likely" to do something to reduce the risk of a fall versus "unlikely" or "not likely at all.". For all other chi square analyses, binary groups were created by reporting the item as a program benefit, facilitator or barrier versus not identifying it as such.

Level of significance was set at .05. For chi square results reaching $p \leq .05$, odds ratio (OR) analyses were performed to compare the odds of registering for a falls prevention program based on the collapsed binary groups. A 95% confidence interval (CI) was used to estimate the accuracy of the OR.

3. Results

3.1. Participant age, gender, and residence

Participants' ages ranged from 60 to 101 years old, with the majority between the ages of 65–84 years old (Table 1). Three-quarters of the participants were female. Nearly half of the participants reported living alone.

3.2. Fall history, perceived fall risk, and fear of falling

Nearly 25% of the participants reported a fall within the past three months (Table 1). Of those who reported a recent fall, 32.9% identified that the fall resulted in an injury that caused the respondent to limit their regular activity for at least a day, or to go see their doctor. While 41.1% of respondents "strongly agree" or "agree" that others familiar with them might feel they are at risk for a fall, only 35.6% endorsed being "somewhat" or "a lot" fearful of falling. However, if "a little" fearful of falling is included, then the percentage of respondents reporting some level of fear of falling increases to 75.88%. Forty-five respondents (12.4%) reported that their fear of falling had "extremely," "quite a bit," or "moderately" interfered with normal social activities during the past four weeks.

3.3. Self-efficacy and awareness of local fall prevention programming

The majority of respondents (80.1%) "agree" or "strongly agree" that a fall would negatively affect their quality of life, and 79.1% of the responses reflected self-efficacy, the belief that it is "somewhat likely" and "very likely" that there are things they could do to reduce their risk of a fall (Table 1). Awareness of local falls prevention programming, however, was limited. Only 38.8% of participants reported hearing about either of the two evidence-based falls prevention programs widely available in New Hampshire, *Tai Ji Quan: Moving for Better Balance* and *A Matter of Balance*, and even fewer respondents (28.0%) were aware if either of these programs were offered in their area.

3.4. Perceived benefits of participating in a falls prevention program

The benefit of participating in a falls prevention program most frequently identified by participants was "getting some exercise" (82.78%). A majority of participants (77.81%) also identified "reducing my risk of falling" as a benefit. Substantially fewer respondents, however, identified "learn something new" (56.95%) as a benefit, and less than half of the participants reported the benefit "meeting new people" (43.71%). None of the participants added a benefit that was not already listed on the survey in the "other" category.

Table 3
Frequencies and Percentages for Program Facilitators and Barriers (n = 306).

	Frequency	%
Facilitators		
Offered close to home	205	67%
No cost - free	199	65%
MD advice to attend	125	41%
Friend encouraging me to attend	63	21%
Safe environment	77	25%
Friendly group leader	116	38%
Transportation	39	13%
Low cost	68	22%
Coffee hour - socializing	44	14%
Free vision screen	41	13%
Group exercise	93	30%
Know fall risk	99	32%
Barriers		
Belief won't fall	65	21%
Lack time	73	24%
Transportation	46	15%
Not offered nearby	141	46%
Too Sick or Ill	18	6%
Won't prevent falling	31	10%
Too rigorous	35	11%
Not rigorous enough	14	5%
Dislike group exercise	24	8%
Pain with Exercise	46	15%
Too tired – Feel fatigued	29	10%
Associated with being old	17	6%

3.5. Self-reported facilitators and barriers to participating in a falls prevention program

Two facilitators for participation in a falls prevention program were reported by a majority of the participants: "offered close to home" (67%) and "no cost–free" (65%) (Table 3). These two facilitators were reported substantially more frequently than the other potential facilitators listed on the survey. The facilitator "Doctor's advice to attend" was identified by less than half of the participants (40.8%). In addition, percentages for identification of this facilitator were similar for those with a history of one or more falls in the past three months and non-fallers. The two least frequently reported facilitators were "transportation available" (12.7%) and "free vision screening" (13.4%).

Barriers to participation in a falls prevention program were less frequently chosen by participants than facilitators (Table 3). Less than half of the participants reported "not offered close to home" (46.1%) as a potential barrier, and "not going to fall" and "lack of time" were reported by less than a quarter of the participants. The remainder of barriers listed on the survey were infrequently chosen.

3.6. Likelihood to register for falls prevention program

When asked about the likelihood of registering for an evidence-based falls prevention program, 71.5% of the participants said they were "Very likely" or "Somewhat likely" to do so. Of those likely to register, only 54.2% had heard of either of the two falls prevention programs offered in their community, and even fewer, 41.4% knew if

Table 4
Likely to Register Frequencies, Percentages, Chi Square and Odds Ratio Results by Fall History, Beliefs and Program Benefits.

Falls & Beliefs	Frequency Likely to Register & %	Chi Square	df	p Value	Odds Ratio (95% CI)
History of Fall	52/81%	4.012	1	0.045*	1.985 (1.006–3.918)
Fear of Falling	195/79%	31.011	1	0.000*	4.350 (2.549–7.509)
Falls Harmful	191/76%	9.844	1	0.002*	2.465 (1.389–4.374)
Self-Efficacy	186/74%	4.002	1	0.045*	1.788 (1.007–3.175)

Program Benefits	Frequency Likely to Register & %	Chi Square	df	P Value	Odds Ratio (CI: 95%)
Reducing Risk of Falling	191/81%	10.221	1	0.001*	2.584 (1.427–4.679)
Getting Exercise	171/85%	23.409	1	0.000*	3.804 (2.174–6.656)
Learning Something New	154/90%	34.755	1	0.000*	5.523 (3.025–10.083)
Meeting New People	109/83%	3.913	1	0.048*	1.758 (1.001–3.086)

CI denotes "confidence interval."
* Statistically Significant p = ≤ .05.

one of the programs was offered in their area. In addition, chi square analyses revealed statistically significant associations between likely to register and all of the factors associated with fall history and beliefs about consequences and risks of falls (Table 4). Participants were more likely to register for a falls prevention program if they reported one or more falls in the past three months, fear of falling, belief that a fall would reduce quality of life, or belief that they could do things to reduce their risk of a fall (self-efficacy). The factor associated with the highest odds of registering for a falls prevention program was fear of falling. Chi square analyses also revealed a statistically significant greater likelihood to register for a falls prevention program for each of the four potential program benefits. The program benefit "learn something new" was associated with the highest odds of registering for falls prevention programming.

In addition, chi-square analyses were performed to examine the associations between participants' self-identified facilitators and their likelihood to register for a falls prevention program (Table 5). Statistically significant associations were found for seven of the 12 potential facilitators listed on the survey including "offered close to home," "no cost-free," "friendly group leader," "free vision screening," "group exercise class," "coffee hour to socialize after class," and "safe environment." The most frequently reported facilitator, "offered close to home," was also associated with the highest odds of registering for a program. Statistical significance was not reached for the other five facilitators.

Chi square analyses were also performed for the reported barriers that participants identified as potentially making them less likely to participate in a falls prevention program (Table 5). Only four of the 12 barriers listed on the survey reached statistical significance. These included "belief that I am not going to fall," "lack of time," "not offered close to home," and "I do not believe they will help prevent me from falling." Odds ratios for barriers were expected to be associated with a

Table 5
Likely to Register Frequencies, Percentages, Chi Square and Odds Ratio Results by Facilitators and Barriers (n = 306).

Facilitators	Frequency Likely to Register & %	Chi Square	df	P Value	Odds Ratio (CI: 95%)
Offered close to home	179/87%	49.144	1	0.000*	6.75 (3.829–11.898)
No cost - free	167/84%	23.373	1	0.000*	3.653 (2.125–6.253)
MD advice to attend	94/75%	0.000	1	0.990	N/A
Friend encouraging me to attend	50/79%	0.750	1	0.386	N/A
Safe environment	66/86%	6.136	1	0.013*	2.378 (1.181–4.789)
Friendly group leader	103/89%	18.591	1	0.000*	3.930 (2.049–7.538)
Transportation	32/82%	1.136	1	0.287	N.A.
Low cost	57/84%	3.512	1	0.061	N.A.
Coffee hour - socializing	40/91%	6.825	1	0.009*	3.789 (1.309–10.971)
Free vision screen	38/93%	7.784	1	0.005*	4.816 (1.442–16.084)
Group exercise	80/86%	8.438	1	0.004*	2.584 (1.341–4.980)
Know fall risk	80/81%	2.498	1	0.114	N.A.

Barriers	Frequency Likely to Register/%	Chi Square	df	P Value	Odds Ratio (CI: 95%)
Belief won't fall	36/55%	17.295	1	0.000*	0.301 (0.168–0.539)
Lack time	62/85%	4.900	1	0.027*	2.181 (1.080–4.401)
Transportation	34/74%	0.045	1	0.831	N.A.
Not offered nearby	119/84%	11.943	1	0.001*	2.631 (1.584–4.630)
Too Sick or Ill	15/83%	0.684	1	0.408	N.A.
Won't prevent falling	17/55%	7.633	1	0.006*	0.353 (0.165–0.757)
Too rigorous	24/69%	0.110	1	0.741	N.A.
Not rigorous enough	10/72%	0.920	1	0.337	N.A.
Dislike group exercise	18/75%	0.000	1	0.985	N.A.
Pain with Exercise	39/85%	2.683	1	0.101	N.A.
Too tired – Feel fatigued	24/83%	0.990	1	0.320	N.A.
Associated with being old	10/59%	2.574	1	0.109	N.A.

CI denotes "confidence interval.
N.A. denotes "not applicable" because chi square analysis did not reach statistical significance.
* Statistically Significant p = ≤ .05.

reduction in likelihood of registering for a program, however, two of the barriers, "lack of time" and "not offered close to home," had odds more than twice as likely to register than those who did not identify the factor as a barrier.

4. Discussion

The purpose of this cross-sectional survey study was to identify factors that increase the likelihood of enrollment in falls prevention programming among community dwelling older adults. While research on the impact of participation in evidence-based falls prevention programs on reduction of fall rates is positive, and there has been an increase in federal funding and offering of these programs in communities throughout the US, falls prevention programming can only be successful if people enroll and participate.

4.1. Fall history, fear of falling, impact on quality of life and self-efficacy

As anticipated, participants with a history of falling were nearly twice as likely to register for a falls prevention program, and those with a fear of falling were more than four times as likely to register for a program (Table 4). However, in contrast to previous falls prevention literature (Bunn et al., 2008), most of the participants in this study agreed that a fall would negatively impact their quality of life, and most identified that there are things they can do to reduce the risk of falling, reflecting self-efficacy (Table 1). The participants who agreed a fall would be harmful and endorsed self-efficacy were 2.5 and 1.8 times more likely to register for a falls prevention program, respectively (Table 4). Further, the majority of all participants responded that they were likely to register for a falls prevention program.

Participant responses align with a belief that falls are not an inevitable part of aging, and our participants' understanding of the impact and non-fatalistic attitude towards falls may be explained by the robust national, state and community public health falls prevention campaigns in the US. In addition, health care practitioners in the US are often required by institutional policies to inquire about recent falls, and to recommend falls prevention measures based on their patient's risk of falling.

These findings at first glance suggest that our current falls prevention educational campaigns are effective. However, while older adults in our sample recognized the value of falls prevention programming, only about half of the participants had heard about the two evidence-based falls prevention programming offered in their state, and even fewer knew if either program was offered near them. This highlights the critical need to get information about local programs to the target audience of older adults. We, therefore, suggest that falls prevention programs be advertised and offered in locations where older adults go in their everyday lives, such as, houses of worship, community centers, fitness clubs, restaurants, and retail stores, such as, pharmacies and supermarkets. Support for this recommendation comes from published studies showing that social marketing has been found to increase enrollment in falls prevention programs (DiGuiseppi et al., 2014; Kreuter & Bernhardt, 2009; Markle-Reid et al., 2017).

4.2. Perceived benefits of participating in a falls prevention program

Participants were asked if they could imagine benefiting from a community-based falls prevention program, and all four potential benefits listed on the survey were found to increase the likelihood of registering for a fall prevention program (Table 4). The two most frequently chosen benefits were "getting some exercise" and "reducing my risk of falling" (Table 3). These findings support the educational component of falls prevention programs. Additionally, program marketing should include not only the benefit of reducing risk of falls, but a wider range of benefits of programming components, such as, physical activity and learning new information.

4.3. Self-reported facilitators and barriers to participating in a falls prevention program

Seven of the 12 potential facilitators were associated with a greater likelihood to register for a falls prevention program (Table 5). These included, in order of the magnitude of the odds ratio, "offered close to home," "free vision screen," "friendly leader," "coffee hour to socialize," "no cost," "group exercise," and "safe place." Interestingly, the frequency of participants identifying a factor as a facilitator was not necessarily associated with the magnitude of the OR. For example, "free vision screen" was one of the least frequently reported facilitators, yet the odds of one of these participants registering for a program was nearly five times higher than a participant who did not identify "free vision screen" as a facilitator. This demonstrates that the findings need to be applied with caution. That is, identifying a particular factor as a facilitator or barrier may not translate into registering for a falls prevention program when all of the influencing factors are weighed against personal preferences and individual needs.

An unexpected finding of this study, and perhaps one of the most important, is related to current literature and falls prevention campaigns that focus on increasing physician fall risk screening, education, and referral to falls prevention programming. This approach reflects a belief that patients will adhere to their health care practitioners' recommendations. Thus, we anticipated that a physician's advice to attend a falls prevention program would be a facilitator highly associated with registering for a program. Instead, less than half of the participants identified "Doctor's advice to attend" as a facilitator, and doctor's advice did not statistically increase their likelihood of registering for a falls prevention program. Interpretation of this finding is challenging, because surveys typically do not provide the process or depth of the participants' decision-making. Our sample may glean the value of falls prevention programming without physician guidance, or other factors may hold greater importance or influence on their decision-making.

Furthermore, citing that only the most basic of needs can be met by a single source Kreuter and Bernhardt (2009), recommend utilizing partnerships for dissemination. They also identified the need for significant investment in a customer-centered marketing and distribution infrastructure that provides evidenced-based public health programs when, where, and how they are needed. Another of their key strategies for bridging the communication gap includes assembling inventories of effective programs, combined with a coordinated distribution on all evidence-based programs in that community. In addition, it is essential that marketing cover a wide range of media, locations, and content aligned with their target audience.

Last, barriers to participating in a program were substantially less frequently identified by participants compared to facilitators (Table 5). Only a third of the barriers listed on the survey were associated with a difference in likelihood to register for a falls prevention program. As expected, there were lower odds of registering for a falls prevention program for participants who believed that they would not fall or that a falls prevention program would not help prevent falling. In contrast, surprisingly the odds of registering for a falls prevention program were more than twice as likely for participants who identified the barriers "lack of time" and "not offered close to home." For these participants, the increased odds in registering for a program may reflect the complexity of decision-making and greater influence of other factors.

4.4. Facilitators and barriers across physical activity and falls prevention studies

Comparing facilitators and barriers across studies is difficult due to differences in the nature of the interventions, choice of factors in the study's questionnaire or interview, and population subgroups including age, gender, culture, living environment, and health status. Furthermore, health promotion programs are most often multi-dimensional, combining a wide range of interventions beyond strengthening, flexibility or balance exercises. For example, in addition to physical activities, falls prevention programs typically include education about fall risks and injury, benefits of fall prevention programming, health and medication management, footwear, residence home safety, and vision. While study findings vary in their lists of facilitators and barriers to enrollment, the Andersen Behavioral Model has been utilized by Olanrewaju et al. (2016) to categorize common emerging predisposing, enabling and need factors impacting physical activity and falls prevention programming uptake. Predisposing factors are based on the individual's personal characteristics and propensity to participate in the programming, including physical health, fall history, fear of falling or injury, self-efficacy or fatalism, social contact, and instructor support. Enabling factors are based on enrollment facilitators, including access, time and cost, and need factors relate to referral from a health professional to participate in a preventative or rehabilitative program. These common emerging facilitators and barriers to enrollment closely match our study's findings.

4.5. Study limitations and recommendations for future research

A central limitation of this study is that the data reflect participant self-reported likelihood to register for a falls prevention program based on specific facilitators and barriers to enrollment, and not actual enrollment. Therefore, to identify the best strategies for falls prevention programming recruitment, it is recommended that future studies establish specific recruitment goals, measure success in goal attainment, collect data on factors influencing enrollment from enrolled participants, and modify recruitment strategies based on feedback. Although more challenging to acquire, data on those who chose not to register would provide important insight when planning marketing campaigns and choosing intervention sites.

Second, inherent in convenience sample studies, the findings should not be generalized to the population at large. Our sample was homogeneous, and limited to English speakers who were community dwelling older adults residing in state of New Hampshire. Findings, therefore, may not be generalizable to older adults from other cultures, or those living in institutional settings, more urban environments, or internationally. Formative research using social marketing that identifies the wants and needs of the target audience is, therefore, recommended to determine the best ways to reach each unique population.

Additionally, caution when interpreting the findings is recommended, as a particular factor identified as a facilitator or barrier may not translate into registering for a program when all influencing factors are weighed against personal preferences and individual needs. Focus groups and other qualitative research designs are therefore recommended to elucidate the process of weighing the multiple factors that influence decision-making. Focus groups provide an opportunity to solicit individual needs, beliefs, opinions and program preferences without the restriction or constraints of survey methodology. They also enable deeper exploration of participant responses with follow-up questioning. In addition, use of an ethnographic approach is recommended to provide an in-depth assessment of the habits and attitudes of a target group. Social marketing campaigns can then be optimized by matching development of the program, recruitment and retention to that target group.

Last, it is recommended that the last survey question be revised to refer generally to the likelihood of registering for a falls prevention program rather than specific programs for which the participant may be unfamiliar. Only about half of the participants reported to be familiar with either of the two falls prevention programs, A Matter of Balance or Tai Ji Quan: Moving for Better Balance, offered in their region. Being unfamiliar with the programs, however, did not preclude participants from identifying that they were likely to register. Of the 240 participants identifying themselves as likely to register, nearly half of the participants were unfamiliar with either program.

5. Conclusion

The purpose of this cross-sectional survey study was to identify factors that increase the likelihood of enrollment in falls prevention programming among community dwelling older adults. The majority of participants in our sample recognized the value of falls prevention programming, the negative impact of a fall on quality of life, believed they could do something to reduce their fall risk, and indicated a likelihood to register for a falls prevention program. Less than half of the participants, however, knew if a falls prevention program available in their area was being offered. This highlights the critical need to disseminate information about local falls prevention programs through multiple partnerships and social marketing in locations where older adults go in their everyday lives, such as, houses of worship, community centers, fitness clubs, restaurants, pharmacies, supermarkets, and other stores.

As expected, many facilitators increased the likelihood of participants registering for a falls prevention program. Caution, however, is recommended when interpreting this finding, since participant identification of a specific facilitator or barrier did not necessarily translate into greater likelihood of registering for a falls prevention program. More likely, enrollment reflects the complexity of decision-making. Focus groups, ethnographic research and other qualitative research designs are recommended to elucidate the process of weighing the multitude of personal preferences and needs that influence decision-making.

The last, and perhaps most important finding, is that the anticipated facilitator "Doctor's advice to attend" was not found to increase the likelihood of registering for a program. This finding supports a paradigm shift from the current health promotion focus on health care practitioners serving as the key change-agents. For wider reach, as stated previously, promoting enrollment in falls prevention programming requires dissemination partnerships and social marketing where older adults reside.

Conflict of interest statement

The authors have no conflicts of interest to report related to this original research.

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Appendix 1. Survey Introduction and Questions

The Foundation for Healthy Communities and the NH Falls Risk Reduction Task Force thanks you for agreeing to take part in this survey. The Foundation for Healthy Communities is seeking to understand through this survey people's beliefs and attitudes around falls risk and falls prevention programs as part of an US DHHS Administration for Community Living grant. The survey results will be used to better serve people as they age to prevent falls. Falls are the leading cause of both fatal and non-fatal injuries for NH older adults

This survey should only take 3 to 4 minutes to complete. The answers you provide will be kept confidential. Survey responses will only be shared in aggregate, meaning only a summary of results will be shared.

The Foundation for Healthy Communities is grateful for the partnership of the NH Falls Risk Reduction Task Force to conduct this survey. To learn more about the NH Falls Risk Reduction

Task Force and other falls prevention resources, please check out the Task Forces website: www.NHFallsTaskForce.org.

Falls Risk Awareness Survey for Individuals 65+

1. What is your age? _____Years
2. Do you live alone? ❑ Yes ❑ No
3. Are you: ❑ Male ❑ Female?
4. In the past 3 months, how many times have you fallen? ❑ none ❑ ____times
   a. If you fell in the past 3 months, how many of these falls caused an injury? *(By an injury we mean the fall caused you to limit your regular activities for at least a day or to go see a doctor.)*
      _____number of falls causing an injury
5. How fearful are you of falling?
   ❑ Not at all ❑ A little ❑ Somewhat ❑ A lot
6. During the last 4 weeks, to what extent has your concern about falling interfered with your normal social activities with family, friends, neighbors or groups?
   ❑ Extremely ❑ Quite a bit ❑ Moderately ❑ Slightly ❑ Not at all
7. Has your doctor ever talked to you about your risk of falling? ❑ Yes ❑ No
8. Might others familiar with you feel you are at risk for a fall?
   ❑ Strongly Agree ❑ Agree ❑ Disagree ❑ Strongly Disagree
9. Do you believe a fall would reduce the quality of your life?
   ❑ Strongly Agree ❑ Agree ❑ Disagree ❑ Strongly Disagree
10. Do you believe there are things you could do to reduce your risk of a fall?
    ❑ Very likely ❑ Somewhat likely ❑ Unlikely ❑ Not likely at all
11. Have you heard of the evidenced-based community fall prevention programs *A Matter of Balance* or *Tai Ji Quan: Moving for Better Balance?*
    ❑ Yes ❑ No
12. Do you know if either of these programs are offered in your area?
    ❑ Yes ❑ No
13. What might make you **more** likely to participate in a falls prevention program? **Check all that apply:**
    ❑ Offered close to home ❑ Transportation available
    ❑ No cost - free ❑ Low cost
    ❑ Doctor's advice to attend ❑ Coffee hour to socialize after class
    ❑ Friend's encouraging me to attend ❑ Free vision screening
    ❑ Safe environment ❑ Group exercise class
    ❑ Friendly group leader ❑ Knowing my fall risk
    ❑ Other? _____
14. What might make you **less** likely to participate in a falls prevention program? **Check all that apply:**
    ❑ Belief that I am not going to fall ❑ Don't like exercising in groups
    ❑ Lack of time ❑ Pain with exercise
    ❑ Transportation issues ❑ Too tired/feeling fatigued
    ❑ Not offered close to home ❑ Associate programs with being old
    ❑ Too sick or ill to participate
    ❑ I do not believe they will help prevent me from falling
    ❑ Belief that programs are too rigorous for me.
    ❑ Belief that programs are not rigorous enough for me.
    ❑ Other? _____
15. What benefits could you imagine from participating in a community based fall prevention program? **Check all that apply:**
    ❑ Feeling that I am taking care of myself, reducing my risk of falling.
    ❑ Getting some exercise.
    ❑ Learning something new.
    ❑ Meeting new people.
    ❑ Other? _____
16. Given your understanding of your risk for a fall, the impact a fall might have on your life, the barriers and benefits you anticipate in participating in an evidenced based community

    prevention program, what is your likelihood that you might register for either A Matter of Balance or Tai Ji Quan: Moving for Better Balance?
    ❑ Very likely ❑ Somewhat likely ❑ Unlikely ❑ Not likely at all

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