

28. Punjabi NM, Caffo BS, Goodwin JL *et al* Sleep-disordered breathing and mortality: a prospective cohort study. *PLoS Med* 2009; 6: e1000132.
29. Arzt M, Floras JS, Logan AG *et al* Suppression of central sleep apnea by continuous positive airway pressure and transplant-free survival in heart failure: a post hoc analysis of

the Canadian Continuous Positive Airway Pressure for Patients with Central Sleep Apnea and Heart Failure Trial (CANPAP). *Circulation* 2007; 115: 3173–80.

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Older people's preferences regarding programme formats for managing concerns about falls

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Abstract

Objective: to explore the preferences of community-dwelling older persons regarding different programme formats for managing concerns about falls.

Subjects and design: cross-sectional study of 5,755 community-dwelling people aged ≥ 70 years in the Netherlands.

Methods: a questionnaire assessed people's willingness to participate per programme format ($n = 6$), i.e. a programme at home, via telephone, via home visits *and* telephone consultations, via television or via Internet.

Results: of the 2,498 responders, 62.7% indicated no interest in any of the formats. The willingness to participate per programme format varied between 21.5 (at home) and 9.4% (via Internet). Among people interested in at least one of the formats ($n = 931$), higher levels of fall-related concerns were associated with increased preference for a programme with home visits. Poor perceived health and age ≥ 80 years were associated with less preference for a group programme. Higher educated people were more in favour of a programme via Internet compared with their lower educated counterparts.

Conclusion: the majority of community-dwelling older people are not likely to participate in any of the six proposed programme formats for managing concerns about falls. However, when diverse formats of effective programmes will be made available, uptake and adherence may be increased since programme preferences are associated to specific population characteristics.

Keywords: aged, fear of falling, programme formats, patient preference, accidental falls, elderly

Introduction

Concerns about falls, often labelled as fear of falling, are frequently reported by community-dwelling older people [1]. Concerns about falls may lead to negative consequences such as activity avoidance [2, 3], physical decline [4], increased fall risk [5, 6], reduced quality of life [7], feelings of depression and anxiety [8] and increased risk of nursing home admission [7]. Certain programmes have the ability to reduce concerns about falls, whether they are primarily or not primarily focused on managing concerns about falls [9]. Nevertheless, among the eligible populations in trials that primarily focused on these concerns, the older people's willingness to take part in (mostly group) programmes was rather low [10–14]. Moreover, drop-out rates of up to 40% among participants who enrolled in a programme are not uncommon [10–17]. This low uptake and high drop-out rate may be caused by various factors—for example, a mismatch between programme requirements and participants' capabilities, or between the programme format and participants' preferences. Clearly, a match between preferences and the programme format may increase uptake and adherence.

Yardley *et al.* studied older people's preferences regarding three fall prevention activities: (i) professionally supervised strength and balance training in a group; (ii) strength and balance training at home following general instructions and (iii) support regarding home modifications. The home-based programmes better suited the respondents' preferences: around 60% indicated their interest for a home-based programme versus 40% for the group-based programme [18]. However, there is hardly any knowledge regarding the willingness of older people to participate in a programme aimed at managing concerns about falls and whether this willingness to participate is related to the format in which the programme is offered—for instance, via telephone, television or Internet.

The aim of this study was to explore the preferences of community-dwelling older people regarding six different formats of a programme that primarily focuses on managing concerns about falls. In addition, the associations between format preferences and several demographic, health-related and fall-related characteristics were studied.

Methods

Study design and participants

A cross-sectional study was carried out in the south of the Netherlands as part of the screening procedure for an RCT. Between March and December 2009, a short questionnaire was mailed to 5,755 community-dwelling people aged ≥ 70 years. People from the general population were randomly selected to participate in the study by local municipal registry offices. A reminder was sent if the questionnaire was not returned within a fortnight. The Medical Ethics

Committee of Maastricht University/Academic Hospital Maastricht approved this study.

Measures

To assess the willingness of respondents to participate in a programme for managing concerns about falls, the following question was formulated:

There are different ways to learn how to manage concerns about falls. A number of possible programme formats, which consist of eight sessions each and are supervised by a community nurse, are presented below. Consider that you are concerned about falling and that you would like to do something about this. In which of the following programme formats would you be willing to participate: (1) in a group (programme with 8–10 persons located in your neighbourhood); (2) at home; (3) by telephone; (4) at home and by telephone (a combination of format 2 and 3); (5) via television or (6) via Internet?

For each format, people indicated their willingness to participate by answering with 'definitely yes', 'maybe yes', 'maybe no' or 'definitely no'.

Furthermore, concerns about falls ('Are you concerned about falling?') and associated activity avoidance ('Do you avoid certain activities due to concerns about falls?') were assessed. Answer options were: 'never', 'almost never', 'sometimes', 'regularly', 'often' and 'very often'. These answer options were then arranged in categories of 'never' (i.e. never and almost never), 'sometimes' and 'often' (i.e. regularly till very often). In addition, several socio-demographic and health-related characteristics were assessed: age (70–75, 75–79 or ≥ 80 years), gender (male or female), living situation (alone or not alone), educational level based on completed education and completed professional courses during lifetime (low, middle or high) [19], perceived general health (good, fair or poor) [20] and falls in the past 6 months (never, once or more than once).

Statistical analyses

Differences in age and gender between responders and non-responders to the questionnaire were tested using Student's *t*-test for age and a Chi-square test for gender. Descriptive analyses were used to obtain insight into the characteristics and preferences of the participants. Prior to the logistic regression analyses answer options of the dependent variable 'willingness to participate in a specific programme format' were dichotomised into 'yes' ('definitely yes' and 'maybe yes') and 'no' ('definitely no' and 'maybe no'). Univariate logistic regression analyses were performed to identify associations between the characteristics and programme format preference. Multivariate logistic regression analyses, in which all variables were included, were performed to test which of the characteristics were independently associated with preference for a programme format. These analyses were first performed in the total group of responders ($n = 2,498$) and next in the subgroup of

Table 1. Population characteristics, preferences for formats of a programme for managing concerns about falls and univariate and multivariate associations ($n = 2,498$)

Characteristics		Preference for intervention formats ^a		Associations	
		None <i>n</i> (%)	At least one <i>n</i> (%)	Univariate OR (95% CI)	Multivariate OR (95% CI)
Total population	2,498 (100.0)	1,567 (62.7)	931 (37.3)		
Demographic					
Gender					
Male	1,085 (43.4)	686 (63.2)	399 (36.8)	—	—
Female	1,413 (56.6)	881 (62.3)	532 (37.7)	1.04 (0.88–1.22)	0.89 (0.73–1.09)
Age					
70–74 years	981 (39.3)	661 (67.4)	320 (32.6)	—	—
75–79 years	784 (31.4)	464 (59.2)	320 (40.8)	1.43 (1.17–1.73)	1.26 (1.02–1.55)
≥ 80 years	733 (29.3)	442 (60.3)	291 (39.7)	1.36 (1.11–1.66)	0.92 (0.74–1.16)
Living situation					
Not alone	1,481 (59.3)	969 (65.4)	512 (34.6)	—	—
Alone	1,017 (40.7)	598 (58.8)	419 (41.2)	1.33 (1.13–1.56)	1.21 (1.00–1.46)
Educational level					
Low	1,354 (54.2)	947 (69.9)	407 (30.1)	—	—
Middle	765 (30.6)	408 (53.3)	357 (46.7)	2.04 (1.70–2.45)	2.39 (1.96–2.92)
High	379 (15.2)	212 (55.9)	167 (44.1)	1.83 (1.45–2.32)	2.26 (1.75–2.91)
Health-related					
Perceived general health					
Good	1,396 (55.9)	925 (66.3)	471 (33.7)	—	—
Fair	987 (39.5)	584 (59.2)	403 (40.8)	1.36 (1.15–1.60)	0.92 (0.76–1.12)
Poor	115 (4.6)	58 (50.4)	57 (49.6)	1.93 (1.32–2.83)	1.07 (0.69–1.65)
Fall-related					
Falls in the past 6 months					
Never	1,808 (72.4)	1,225 (67.8)	583 (32.2)	—	—
Once	408 (16.3)	217 (53.2)	191 (46.8)	1.85 (1.49–2.30)	1.38 (1.09–1.74)
More than once	282 (11.3)	125 (44.3)	157 (55.7)	2.64 (2.05–3.41)	1.47 (1.10–1.97)
Concerns about falls					
(Almost) never	1,346 (53.9)	990 (73.6)	356 (26.4)	—	—
Sometimes	797 (31.9)	432 (54.2)	365 (45.8)	2.35 (1.95–2.83)	2.03 (1.63–2.54)
Regularly till very often	355 (14.2)	145 (40.8)	210 (59.2)	4.03 (3.16–5.14)	3.11 (2.22–4.35)
Avoidance of activities					
(Almost) never	1,648 (66.0)	1,152 (69.9)	496 (30.1)	—	—
Sometimes	493 (19.7)	249 (50.5)	244 (49.5)	2.28 (1.85–2.80)	1.56 (1.22–2.00)
Regularly till very often	355 (14.2)	166 (46.5)	191 (53.5)	2.67 (2.12–3.37)	1.46 (1.06–2.03)

OR, odds ratio; CI, confidence interval; [—], reference group. Odds ratios with significant results are displayed in bold.

^aThe dependent variable ‘willingness to participate in a programme for managing concerns about falls’ was dichotomised into preference for programme formats of ‘none’ and ‘at least 1’. ‘None’ implies that respondents answered ‘maybe no’ or ‘definitely no’ for all six formats; ‘at least one’ implies that respondents answered ‘definitely yes’ or ‘maybe yes’ for at least one of the six presented formats.

responders who indicated their interest for at least one of the programme formats ($n = 931$). A 0.05 level of significance was used for all analyses. All data were analysed using SPSS 17.0.

Results

Of the 5,755 sent questionnaires, 2,997 were returned (response rate: 52.1%). Since 499 questionnaires were incomplete, 2,498 were included in the analyses. Non-responders and those excluded (total: $n = 3,257$) differed significantly from responders ($n = 2,498$) regarding age (mean age: 77.6, standard deviation (SD) = 5.7 versus mean age 77.0, SD = 5.3, respectively; $P \leq 0.001$) and gender (60.7 versus 56.6% female, respectively; $P = 0.02$).

Table 1 (second column) shows the characteristics of the responders. In short, nearly 45% were male, nearly 40% were aged 70–74 years and more than 50% rated their general health as good. One or more falls were reported by less than 30% of the responders, slightly over 45% reported that they had concerns about falls sometimes till very often and almost 35% reported that they avoided activities sometimes till very often due to concerns about falls.

Table 1 also shows that the minority of the responders of the total group (37.3%) were interested in participating in one of the formats. Among the responders who actually reported concerns about falls, the interest to participate in at least one format increased to 45.8% (for those who reported having concerns about falls sometimes) and 59.2% (for those who reported having concerns about falls regularly till very often). There was an overlap in preferences,

Table 2. Preferences for formats of a programme for managing concerns about falls according to population characteristics (*n* = 2,498)

Characteristics	More likely to participate in an intervention format ^a :					
	in a group	at home	by telephone	at home and by telephone	via television	via Internet
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Total population	429 (17.2)	536 (21.5)	441 (17.7)	468 (18.7)	438 (17.5)	234 (9.4)
Demographic						
Gender						
Male	183 (16.9)	236 (21.8)	189 (17.4)	208 (19.2)	197 (18.2)	147 (13.5)
Female	246 (17.4)	300 (21.2)	252 (17.8)	260 (18.4)	241 (17.1)	87 (6.2)
Age						
70–74 years	161 (16.4)	174 (17.7)	158 (16.1)	150 (15.3)	161 (16.4)	117 (11.9)
75–79 years	154 (19.6)	176 (22.4)	158 (20.2)	164 (20.9)	156 (19.9)	80 (10.2)
≥ 80 years	114 (15.6)	186 (25.4)	125 (17.1)	154 (21.0)	121 (16.5)	37 (5.0)
Living situation						
Not alone	230 (15.5)	283 (19.1)	243 (16.4)	244 (16.5)	248 (16.7)	159 (10.7)
Alone	199 (19.6)	253 (24.9)	198 (19.5)	224 (22.0)	190 (18.7)	75 (7.4)
Educational level						
Low	173 (12.8)	239 (17.7)	183 (13.5)	204 (15.1)	176 (13.0)	60 (4.4)
Middle	182 (23.8)	205 (26.8)	165 (21.6)	172 (22.5)	171 (22.4)	103 (13.5)
High	74 (19.5)	92 (24.3)	93 (24.5)	92 (24.3)	91 (24.0)	71 (18.7)
Health-related						
Perceived general health						
Good	226 (16.1)	258 (18.5)	235 (16.8)	223 (16.0)	239 (17.1)	149 (10.7)
Fair	186 (18.8)	236 (23.9)	183 (18.5)	210 (21.3)	178 (18.0)	77 (7.8)
Poor	17 (14.8)	42 (36.5)	23 (20.0)	35 (30.4)	21 (18.3)	8 (7.0)
Fall-related						
Falls in the past 6 months						
Never	268 (14.8)	315 (17.4)	275 (15.2)	271 (15.0)	282 (15.6)	161 (8.9)
Once	87 (21.3)	115 (28.2)	95 (23.3)	102 (25.0)	92 (22.5)	42 (10.3)
More than once	74 (26.2)	106 (37.6)	71 (25.2)	95 (33.7)	64 (22.7)	31 (11.0)
Concerns about falls						
(Almost) never	162 (12.0)	170 (12.6)	162 (12.0)	153 (11.4)	185 (13.7)	123 (9.1)
Sometimes	169 (21.2)	219 (27.5)	172 (21.6)	187 (23.5)	162 (20.3)	75 (9.4)
Regularly till very often	98 (27.6)	147 (41.4)	107 (30.1)	128 (36.1)	91 (25.6)	36 (10.1)
Avoidance of activities						
(Almost) never	234 (14.2)	254 (15.4)	231 (14.0)	223 (13.5)	242 (14.7)	150 (9.1)
Sometimes	119 (24.1)	152 (30.8)	122 (24.7)	131 (26.6)	123 (24.9)	53 (10.8)
Regularly till very often	76 (21.3)	130 (36.4)	88 (17.7)	114 (31.9)	73 (20.4)	31 (8.7)

^aThe dependent variable ‘willingness to participate in a programme for managing concerns about falls’ was dichotomised into ‘yes’ and ‘no’. More likely to participate implies that respondents answered ‘definitely yes’ or ‘maybe yes’ to the format compared with ‘definitely no’ or ‘maybe no’.

indicating that some people were willing to participate in multiple programme formats. Only 2.4% would participate in each of the presented formats (not tabulated). Univariate logistic regression analysis showed that older age, status of living alone, higher educational level, poorer perceived general health, more falls in the past 6 months, higher levels of concerns about falls and avoidance of activities were all significantly related to the preference to participate in at least one format (Table 1). Men and women were equally interested in programme formats since no association was shown for gender. After controlling for the characteristics (multivariate analysis), the significant associations for higher age and perceived general health disappeared. The preferences of the responders regarding the six different formats for programmes for managing concerns about falls are illustrated in Table 2. People were most willing to participate in a programme that consists of only home visits, and were least willing to participate in an Internet programme,

21.5 and 9.4%, respectively. The preference rates for the other programme formats varied between 17 and 19%.

Table 3 illustrates the univariate associations between the preferences of responders who were willing to participate in at least one programme format (*n* = 931) and the demographic, health-related and fall-related characteristics. For example, people ≥80 years and those with poor perceived general health were less in favour of the group programme than the younger age groups and those with good perceived general health. In contrast, a programme with only home visits was preferred by the oldest people as well as the people with poor perceived general health. The same holds for those who reported multiple falls, concerns about falls and avoidance of activities. See Table 3 for all univariate associations.

Although many associations disappeared after controlling for the other characteristics in the multivariate analyses, several significant associations were observed (see

Table 3. Univariate associations of preferences regarding formats of a programme for managing concerns about falls with demographic, health-related and fall-related characteristics (*n* = 931)^a

Characteristics	<i>n</i> (%)	More likely to participate in an intervention format ^b :					
		in a group		at home		by telephone	
		<i>n</i> (%)	OR (95% CI)	<i>n</i> (%)	OR (95% CI)	<i>n</i> (%)	OR (95% CI)
Demographic							
Gender							
Male	399 (42.9)	183 (45.9)	—	236 (59.1)	—	189 (47.4)	—
Female	532 (57.1)	246 (46.2)	1.02 (0.78–1.32)	300 (56.4)	0.89 (0.69–1.16)	252 (47.4)	1.00 (0.77–1.30)
Age							
70–74 years	320 (34.4)	161 (50.3)	—	174 (54.4)	—	158 (49.4)	—
75–79 years	300 (34.4)	154 (48.1)	0.92 (0.67–1.25)	176 (55.0)	1.03 (0.75–1.40)	158 (49.4)	1.00 (0.73–1.36)
≥ 80 years	291 (31.3)	114 (39.2)	0.64 (0.46–0.88)	186 (63.9)	1.49 (1.07–2.06)	125 (43.0)	0.77 (0.56–1.06)
Living situation							
Not alone	512 (55.0)	230 (44.9)	—	283 (55.3)	—	243 (47.5)	—
Alone	419 (45.0)	199 (47.5)	1.11 (0.86–1.44)	253 (60.4)	1.23 (0.95–1.60)	198 (47.3)	0.99 (0.77–1.28)
Educational level							
Low	407 (43.7)	173 (42.5)	—	239 (58.7)	—	183 (45.0)	—
Middle	357 (38.3)	182 (51.0)	1.41 (1.06–1.87)	205 (57.4)	0.95 (0.71–1.26)	165 (46.2)	1.05 (0.79–1.40)
High	167 (17.9)	74 (44.3)	1.08 (0.75–1.55)	92 (55.1)	0.86 (0.60–1.24)	93 (55.7)	1.54 (1.07–2.21)
Health-related							
Perceived general health							
Good	471 (50.6)	226 (48.0)	—	258 (54.8)	—	235 (49.9)	—
Fair	403 (43.3)	186 (46.2)	0.93 (0.71–1.21)	236 (58.6)	1.17 (0.89–1.53)	183 (45.4)	0.84 (0.64–1.09)
Poor	57 (6.1)	17 (29.8)	0.46 (0.25–0.84)	42 (73.7)	2.31 (1.25–4.28)	23 (40.4)	0.68 (0.39–1.19)
Fall-related							
Falls in the past 6 months							
Never	583 (62.6)	268 (46.0)	—	315 (54.0)	—	275 (47.2)	—
Once	191 (20.5)	87 (54.5)	0.98 (0.71–1.37)	115 (60.2)	1.29 (0.92–1.80)	95 (47.4)	1.11 (0.80–1.54)
More than once	157 (16.9)	74 (47.1)	1.05 (0.74–1.49)	106 (67.5)	1.77 (1.22–2.56)	71 (45.2)	0.93 (0.65–1.32)
Concerns about falls							
(Almost) never	356 (38.2)	162 (45.5)	—	170 (47.8)	—	162 (45.5)	—
Sometimes	365 (39.2)	169 (46.3)	1.03 (0.77–1.38)	219 (60.0)	1.64 (1.22–2.21)	172 (47.1)	1.07 (0.80–1.43)
Regularly till very often	210 (22.6)	98 (46.7)	1.05 (0.74–1.48)	147 (70.0)	2.55 (1.78–3.66)	107 (51.0)	1.24 (0.88–1.75)
Avoidance of activities							
(Almost) never	496 (53.3)	234 (47.2)	—	254 (51.2)	—	231 (46.6)	—
Sometimes	244 (26.2)	119 (48.8)	1.07 (0.78–1.45)	152 (62.3)	1.57 (1.15–2.15)	122 (50.0)	1.15 (0.84–1.56)
Regularly till very often	191 (20.5)	76 (39.8)	0.74 (0.53–1.04)	130 (68.1)	2.03 (1.43–2.89)	88 (46.1)	0.98 (0.70–1.37)
Characteristics							
More likely to participate in an intervention format^b:							
		at home and by telephone		via television		via Internet	
		<i>n</i> (%)	OR (95% CI)	<i>n</i> (%)	OR (95% CI)	<i>n</i> (%)	OR (95% CI)
Demographic							
Gender							
Male	399 (42.9)	208 (52.1)	—	197 (49.4)	—	147 (36.8)	—
Female	532 (57.1)	260 (48.9)	0.88 (0.68–1.14)	241 (45.3)	0.85 (0.66–1.10)	87 (16.4)	0.34 (0.25–0.46)
Age							
70–74 years	320 (34.4)	150 (46.9)	—	161 (50.3)	—	117 (36.6)	—
75–79 years	300 (34.4)	164 (51.3)	1.19 (0.87–1.63)	156 (48.8)	0.94 (0.67–1.28)	80 (25.0)	0.58 (0.41–0.81)
≥80 years	291 (31.3)	154 (52.9)	1.27 (0.93–1.75)	121 (41.6)	0.70 (0.51–0.97)	37 (12.7)	0.25 (0.17–0.38)
Living situation							
Not alone	512 (55.0)	244 (47.7)	—	248 (48.4)	—	159 (31.1)	—
Alone	419 (45.0)	224 (53.5)	1.26 (0.97–1.63)	190 (45.3)	0.88 (0.68–1.14)	75 (17.9)	0.48 (0.35–0.66)
Educational level							
Low	407 (43.7)	204 (50.1)	—	176 (43.2)	—	60 (14.7)	—
Middle	357 (38.3)	172 (48.2)	0.93 (0.70–1.23)	171 (47.9)	1.21 (0.91–1.61)	103 (28.9)	2.35 (1.64–3.35)
High	167 (17.9)	92 (55.1)	1.22 (0.85–1.75)	91 (54.5)	1.57 (1.09–2.26)	71 (42.5)	4.28 (2.84–6.45)
Health-related							
Perceived general health							
Good	471 (50.6)	223 (47.3)	—	239 (50.7)	—	149 (31.6)	—
Fair	403 (43.3)	210 (52.1)	1.21 (0.93–1.58)	178 (44.2)	0.77 (0.59–1.00)	77 (19.1)	0.51 (0.37–0.70)
Poor	57 (6.1)	35 (50.3)	1.77 (1.01–3.11)	21 (36.8)	0.57 (0.32–1.00)	8 (14.0)	0.35 (0.16–0.76)

Continued

Table 3. Continued

Characteristics	n (%)	More likely to participate in an intervention format ^b :					
		at home and by telephone		via Television		via Internet	
		n (%)	OR (95% CI)	n (%)	OR (95% CI)	n (%)	OR (95% CI)
.....							
Fall-related							
Falls in the past 6 months							
Never	583 (62.6)	271 (46.5)	—	282 (48.4)	—	161 (27.6)	—
Once	191 (20.5)	102 (53.4)	1.32 (0.95–1.83)	92 (48.2)	0.99 (0.72–1.38)	42 (22.0)	0.74 (0.50–1.09)
More than once	157 (16.9)	95 (60.5)	1.76 (1.23–2.53)	64 (47.0)	0.74 (0.51–1.05)	31 (19.7)	0.65 (0.42–0.99)
Concerns about falls							
(Almost) never	356 (38.2)	153 (43.0)	—	185 (52.0)	—	123 (34.6)	—
Sometimes	365 (39.2)	187 (51.2)	1.39 (1.04–1.87)	162 (44.4)	0.74 (0.55–0.99)	75 (20.5)	0.64 (0.35–0.69)
Regularly till very often	210 (22.6)	128 (61.0)	2.07 (1.46–2.93)	91 (43.3)	0.71 (0.50–1.00)	36 (17.1)	0.39 (0.26–0.60)
Avoidance of activities							
(Almost) never	496 (53.3)	223 (45.0)	—	242 (48.8)	—	150 (30.2)	—
Sometimes	244 (26.2)	131 (53.7)	1.42 (1.04–1.93)	123 (50.4)	1.07 (0.79–1.45)	53 (21.7)	0.64 (0.45–0.92)
Regularly till very often	191 (20.5)	114 (59.7)	1.81 (1.29–2.54)	73 (38.2)	0.65 (0.46–0.91)	31 (16.2)	0.45 (0.29–0.69)

OR, odds ratio; CI, confidence interval; [—], reference group. Odds ratios with significant results are displayed in bold.

^aOnly respondents who answered ‘definitely yes’ or ‘maybe yes’ for at least one of the six presented formats were included in these analyses.

^bThe dependent variable ‘willingness to participate in a programme for managing concerns about falls’ was dichotomised into ‘yes’ and ‘no’. More likely to participate implies that respondents answered ‘definitely yes’ or ‘maybe yes’ to the format compared with ‘definitely no’ or ‘maybe no’.

Appendix, Supplementary data are available in *Age and Ageing* online). The oldest people and those with a poor perceived general health had significantly less preference for a group programme. The likelihood of participating in a programme with home visits only was associated with higher levels of concerns about falls; also, in comparison to men women did not prefer this format. The univariate associations for age and perceived general health disappeared. A programme by telephone was associated only with a high educational level. In comparison to the programme with home visits only, women were less willing to participate in a programme with a combination of home visits and telephone consultations; however, people with concerns about falls preferred this format. No associations were found between any of the characteristics and the television programme format. Being a woman, being older and having a low level of education were all associated with less preference for a programme via Internet.

Discussion

This cross-sectional study among community-dwelling older people showed that nearly 63% of respondents expressed no interest in participating in any of the six proposed programme formats for managing concerns about falls, despite considering the presence of these concerns in their lives. This percentage decreased to 41%, however, for those actually reporting (either regularly, often or very often) concerns about falls. The programme at home was preferred the most (about 22%) and the programme via Internet the least (about 9%). The preference rates for the other formats hardly varied, i.e. they ranged between 17% for the group-based programme and 19% for the programme with a combination of home visits and telephone

consultations. The likelihood to participate in at least one programme format was independently associated with being 74–79 years of age, living alone, higher educational level, having more falls in the past 6 months, having higher levels of concerns about falls and avoidance of activities. For the subgroup of people who were willing to participate in at least one programme, higher levels of concerns about falls were independently associated with the preference for a programme that includes home visits. Furthermore, a higher educational level was related to the preference for a programme via Internet.

In the present study, the preference to participate in the different programme formats was generally lower than what Yardley *et al.* reported with respect to their fall prevention programmes (between 9 and 22% versus 40 and 60%, respectively) [18], but the pattern of a stronger preference for a programme at home compared with that in a group setting is similar in both studies.

Several background characteristics, such as gender and level of concerns about falls, of those who were willing to participate are associated with the preference for specific programme formats; therefore, it is likely that uptake can be increased by offering different programme formats according to these characteristics. The successful cognitive behavioural group programme ‘A Matter of Balance’ [14, 17], which addresses concerns about falls and activity avoidance could be made suitable for different formats [21]. In this perspective the oldest old or those with poor perceived health could be offered a home-based programme and the higher educated people could be offered a format via television or through the Internet. Future research is needed to confirm whether or not these programme formats are as effective as the above-mentioned group approach wherein also costs should be taken into account.

A few aspects in this study are noteworthy. To the best of our knowledge, this was the first study that examined older people's preferences regarding programme formats regarding the management of concerns about falls. The question of being concerned about falling and also being willing to do something about these concerns, while indicating a preference for programme formats, was specifically designed for this study. Aside from face validity, no additional testing for psychometric properties had been performed. It may have been difficult for people who were not concerned about falling to nevertheless regard themselves as having concern for the subject; however, special interest was given to the preferences of the group that did have concerns about falls. Additionally, it is conceivable that not only preference for a particular format but also the preparedness or motivation to participate in a programme more generally was measured. In addition to this study, it would be interesting to ask why people do or do not want to participate in any of the proposed formats, for example, with focus group interviews [22, 23]. This may provide information as to in what kind of programme format older people with concerns about falls would be willing to participate, as perhaps they are only interested in written information that can be sent to them, or might prefer the programme to be led by someone else—a general practitioner or a psychologist. Not all preferences can be responded to in daily practice, however, due to a lack of proven effectiveness of the method or programme, or restrictions in resources like money or manpower, or both. Lastly, stating one's intention or willingness to participate in a programme format may not reflect actual participation in a programme, as can be seen by the high drop-out rates of such programmes [11, 12, 14, 15, 17, 24]. In particular, people who have high concerns about falls could experience substantial tension with regard to participating in any programme in which they will be confronted with their concerns. An appropriate recruitment strategy is therefore needed—for example, a face-to-face meeting or a telephone call with the facilitator, in which a potential participant obtains information about the programme and its relevant content [25, 26].

Strengths of this study were, however, its largely representative sample of the general population and its accurate comparison of preferences regarding the programme format. This was particularly relevant because the information provided about the programme (i.e. managing concerns about falls in eight sessions guided by a community nurse) was similar across the different formats. Moreover, our findings are important for practice, as uptake and adherence can be increased by offering older people a programme format depending on their characteristics or preferences.

We found that the majority of older people did not want to participate in any of the presented programme formats for managing concerns about falls, despite considering the presence of these concerns in their lives, as well as the motivation to do something about these concerns. Yet, it is promising that people who actually reported concerns

about falls were substantially more willing to participate. Furthermore, several background characteristics were clearly associated with preferences for specific programme formats, thus providing opportunities for tailor-made interventions. We therefore recommend the development of different formats of effective programmes for managing concerns about falls. As a result, uptake and adherence of these programmes may improve as community-living older people can choose a programme that fits their preference.

Key points

- The majority of community-dwelling older people are not likely to participate in any of the presented programme formats to learn to manage concerns about falls, despite their concerns and their desire to do something about it.
- A programme format with eight home visits focusing on managing concerns about falls is most popular compared with a programme format conducted in a group, via telephone, via a combination of home visits and telephone consultations, via television or via Internet.
- Background characteristics, such as gender, perceived general health, level of education and concerns about falls are associated with preferences for specific programme formats; therefore acceptance for starting such a programme could be increased by offering tailor-made programmes according to these characteristics.

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Conflicts of interest

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Supplementary data

Supplementary data mentioned in the text is available to subscribers in *Age and Ageing* online.

References

1. Scheffer AC, Schuurmans MJ, van Dijk N, van der Hooft T, de Rooij SE. Fear of falling: measurement strategy, prevalence, risk factors and consequences among older persons. *Age Ageing* 2008; 37: 19–24.
2. Tinetti ME, Powell L. Fear of falling and low self-efficacy: a cause of dependence in elderly persons. *J Gerontol* 1993; 48: 35–8.
3. Deshpande N, Metter EJ, Lauretani F, Bandinelli S, Guralnik JF, Ferrucci L. Activity restriction induced by fear of falling and objective and subjective measures of physical function: a prospective cohort study. *J Am Geriatr Soc* 2008; 56: 615–20.
4. Delbaere K, Crombez G, Vanderstraeten G, Willems T, Cambier D. Fear-related avoidance of activities, falls and physical frailty. A prospective community-based cohort study. *Age Ageing* 2004; 33: 368–73.
5. Delbaere K, Close JCT, Brodaty H, Sachdev P, Lord SR. Determinants of disparities between perceived and physiological risk of falling among elderly people: cohort study. *Br Med J* 2010; 341: c4165. doi:10.1136/bmj.
6. Friedman SM, Munoz B, West SK, Rubin GS, Fried LP. Falls and fear of falling: Which comes first? A longitudinal prediction model suggests strategies for primary and secondary prevention. *J Am Geriatr Soc* 2002; 50: 1329–35.
7. Cumming RG, Salkeld G, Thomas M, Szonyi G. Prospective study of the impact of fear of falling on activities of daily living, SF-36 scores, and nursing home admission. *J Gerontol A Biol Sci Med Sci* 2000; 55: M299–305.
8. Arfken CL, Lach HW, Birge SJ, Miller JP. The prevalence and correlates of fear of falling in elderly persons living in the community. *Am J Public Health* 1994; 84: 565–70.
9. Bula CJ, Monod S, Hoskovec C, Rochat S. Interventions aiming at balance confidence improvement in older adults: an updated review. *Gerontology* 2011; 57: 276–86.
10. Brouwer BJ, Walker C, Rydahl SJ, Culham EG. Reducing fear of falling in seniors through education and activity programs: a randomized trial. *J Am Geriatr Soc* 2003; 51: 829–34.
11. Clemson L, Cumming RG, Kendig H, Swann M, Heard R, Taylor K. The effectiveness of a community-based program for reducing the incidence of falls in the elderly: a randomized trial. *J Am Geriatr Soc* 2004; 52: 1487–94.
12. Sattin RW, Easley KA, Wolf SL, Chen Y, Kutner MH. Reduction in fear of falling through intense tai chi exercise training in older, transitionally frail adults. *J Am Geriatr Soc* 2005; 53: 1168–78.
13. Zhang JG, Ishikawa-Takata K, Yamazaki H, Morita T, Ohta T. The effects of Tai Chi Chuan on physiological function and fear of falling in the less robust elderly: an intervention study for preventing falls. *Arch Gerontol Geriatr* 2006; 42: 107–16.
14. Zijlstra GA, van Haastregt JC, Ambergen T *et al* Effects of a multicomponent cognitive behavioral group intervention on fear of falling and activity avoidance in community-dwelling older adults: results of a randomized controlled trial. *J Am Geriatr Soc* 2009; 57: 2020–8.
15. Arai T, Obuchi S, Inaba Y *et al* The effects of short-term exercise intervention on falls self-efficacy and the relationship between changes in physical function and falls self-efficacy in Japanese older people: a randomized controlled trial. *Am J Phys Med Rehabil* 2007; 86: 133–41.
16. Liu H, Rainey J, Zabel R, Quibben MU, Kehayov A, Boswell JK. Comparison of two exercise programs using the Falls Efficacy Scale, Berg Balance Scale and ankle dorsiflexor strength in older adults. *Phys Occup Ther Geriatr* 2007; 26: 23–42.
17. Tennstedt S, Howland J, Lachman M, Peterson E, Kasten L, Jette A. A randomized, controlled trial of a group intervention to reduce fear of falling and associated activity restriction in older adults. *J Gerontol B Psychol Sci Soc Sci* 1998; 53: P384–92.
18. Yardley L, Kirby S, Ben-Shlomo Y, Gilbert R, Whitehead S, Todd C. How likely are older people to take up different falls prevention activities? *Prev Med* 2008; 47: 554–8.
19. CBS. Standaard Onderwijsindeling 2006. Editie 2009/'10. [Standard classification of education 2006. Edition 2009/'10]. Voorburg/Heerlen: Centraal Bureau voor de Statistiek, 2009.
20. Stewart AL, Hays RD, Ware JE. The Mos Short-Form General Health Survey—reliability and validity in a patient population. *Med Care* 1988; 26: 724–32.
21. Zijlstra GAR. Managing Concerns About Falls Fear of Falling and Avoidance of Activity in Older People. Maastricht: Maastricht University, 2007.
22. Boyd R, Stevens JA. Falls and fear of falling: burden, beliefs and behaviours. *Age Ageing* 2009; 38: 423–8.
23. Calhoun R, Meischke H, Hammerback K *et al* Older adults' perceptions of clinical fall prevention programs: a qualitative study. *J Aging Res.* 2011; doi:10.4061/2011/867341. Epub ahead of print.
24. Webb TL, Sheeran P. Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychol Bull* 2006; 132: 249–68.
25. Crawford Shearer NB, Fleury JD, Belyea M. An innovative approach to recruiting homebound older adults. *Res Gerontol Nurs* 2010; 3: 11–8.
26. Stevens M, de Jong J, Lemmink KA. The Groningen Active Living Model, an example of successful recruitment of sedentary and underactive older adults. *Prev Med* 2008; 47: 398–401.

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