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Title

Factors associated with older patients' engagement in exercise after hospital discharge.

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Objectives

To identify factors that are associated with older patients' engagement in exercise in the 6 months following hospital discharge.

Design

A prospective observational study using qualitative and quantitative evaluation.

Setting

Follow up of hospital patients in their home setting after discharge from a metropolitan general hospital.

Participants

Participants (n=343) were older patients (mean age 79.4 ± 8.5 years) discharged from medical, surgical and rehabilitation wards and followed up for 6 months after discharge.

Interventions

Not applicable.

Main outcome measures

Self perceived awareness and risk of falls measured at discharge using a survey that addressed elements of the Health Belief Model. Engagement and self reported barriers to engagement in exercise measured at 6 months after discharge using a telephone survey.

Results

Six months after discharge 305 participants remained in the study of whom 109 (35.7%) were engaging in a structured exercise program. Multivariable logistic regression analysis demonstrated participants were more likely to be engaging in exercise if they perceived they were at risk of serious injury from a fall (OR 0.61, 95% CI=0.48, 0.78, $P<0.001$), if exercise was recommended by the hospital physiotherapist (OR 1.93, 95% CI=1.03, 3.59, $P=0.04$) and if they lived with a partner (OR 1.97, 95% CI=1.18, 3.28, $P=0.009$). Barriers to exercise identified by 168 (55%) participants included low self efficacy, low motivation, medical problems such as pain and impediments to program delivery.

Conclusions

Older patients have low levels of engagement in exercise following hospital discharge. Researchers should design exercise programs that address identified barriers and facilitators and provide education to enhance motivation and self efficacy to exercise in this population.

Key words

patient discharge; self efficacy; exercise; aged

1 Introduction

2

3 Older patients are at high risk of falls following a stay in hospital.^{1,2} Falls may be linked to
4 other adverse events that occur during this period including functional decline, onset of
5 disability, unplanned re-admission to hospital, and reduced health related quality of life.³⁻⁸

6 Participation in exercise programs has been shown to reduce falls and improve mobility and
7 function amongst community dwelling people.⁹⁻¹¹ There is also emerging evidence that
8 exercise may be beneficial for older patients recently discharged from hospital.¹²⁻¹⁴

9

10 The efficacy of exercise programs can be limited by poor participation levels. Older people
11 are often reluctant to engage in falls prevention activities, especially exercise.¹⁵⁻¹⁹ Factors
12 associated with low exercise participation rates include low self efficacy, low self perceived
13 risk of falling, fear of falling, positive attitude to exercise or no previous history of
14 exercise.^{16, 17 20, 21} Trials that have provided exercise interventions aimed at reducing falls
15 rates have reported low levels of engagement by older people who identify barriers such as
16 being sufficiently active and poor cognitive, physical or psychological function.²²⁻²⁴ A recent
17 randomized controlled trial (RCT) that provided falls prevention exercises to a post discharge
18 population reported an adherence rate of 69% to the exercise intervention.¹⁴ This was
19 achieved with daily 30 minute individual training sessions in hospital by a physiotherapist in
20 addition to regular physiotherapy prior to discharge and a printed handout.

21

22 However the factors predicting older patients' engagement in exercise following hospital
23 discharge are not known, in spite of the increased falls risk in this population. Potentially
24 effective interventions such as exercise will have no effect if older people perceive

25 insurmountable barriers to engaging in these recommended behaviors.²⁵ Therefore
26 researchers need to understand the facilitators and barriers to engaging in exercise in the post
27 discharge period. Previous studies have concluded that older peoples' attitudes and beliefs
28 affect their adherence to falls prevention and other exercise programs^{15-17, 20, 26} and therefore
29 should be measured together with other factors of interest. The Health Belief Model (HBM)
30 is a recognised health behavior model²⁷ that provides an empirically supported framework to
31 measure these factors and has been used previously to understand older peoples' awareness
32 and self perceived risk of falls and falls injuries.^{28, 29} The HBM conceptualises that a person
33 will engage in protective health behavior if they: i) perceive they are at risk of contracting a
34 negative health condition; ii) perceive that its consequences will be severe enough to
35 adversely affect their health; iii) consider that the benefits of engaging in the health behavior
36 outweigh the costs of undertaking it; iv) receive a cue to engage in the behavior. Additionally
37 the person requires self efficacy to engage in the action.²⁷ The aim of this study was to
38 explore and identify factors that are associated with engagement in a structured exercise
39 program in the 6 months following discharge from hospital. The study also aimed to identify
40 older patients' self-perceived barriers to engagement in exercise during this period.
41

42 Methods

43

44 Design

45

46 A prospective observational study using quantitative and qualitative evaluation was
47 undertaken through two cross-sectional survey waves (at hospital discharge and 6 months
48 following discharge).

49

50 Participants and setting

51

52 Participants (n=343) were a cohort of consecutively enrolled patients who were discharged
53 from general medical, surgical, stroke or rehabilitation wards of one hospital. Participants
54 were part of a multi-site RCT (n=1206) that investigated the effect of an education
55 intervention on falls rates in hospital.³⁰ Patients were eligible for inclusion in this trial if they
56 were over 60 years old, had been admitted to a participating ward (and not previously
57 enrolled in this study) and they (or their family) provided written consent. As part of the
58 RCT, approximately two thirds of the cohort in this study (n=243, 70.8%) had received
59 inpatient falls prevention education in addition to their usual care; the education aimed to
60 empower them to reduce their hospital falls risk (such as ringing the patient call bell for
61 assistance and being aware of hazards in the hospital environment). No exercise program was
62 prescribed as part of the intervention though participation in hospital rehabilitation programs
63 was encouraged. Additionally since the present study was an observational follow up to the
64 inpatient RCT, no advice about exercise or falls prevention after discharge was provided to
65 participants. The remaining participants (n=100, 29.2%) received usual care. Usual care for
66 all participants included assessment by discharge teams, discharge information about

67 community services and delivery of home support services and ongoing medical and therapy
68 outpatient services as required.

69

70 Outcome measures

71

72 The primary outcome measures were:

73 i. Participants' attitudes and beliefs about falls

74 These included awareness and self perceived risk of falls and falls injuries and self efficacy to
75 reduce their risk of falling in the 6 months following discharge from hospital. These items
76 were measured with a face to face survey administered at the point of discharge from
77 hospital. The survey items (shown in table 2) were scored using a five point Likert scale
78 (strongly agree to strongly disagree). The survey items were designed using the constructs of
79 the HBM^{31, 32} and also based on a previously designed survey that examined older peoples'
80 attitudes and beliefs about falls and was tested in an older hospital population.²⁸

81

82 ii. Participants' reported engagement in structured exercise. Exercise was defined as a
83 structured program that included strength and balance training, not including
84 household activity or walking and was classified as supervised or unsupervised,
85 conducted by a health care professional or other exercise provider and completed in a
86 group or using a home program. The definition for exercise was based on guideline
87 recommendations for exercise for older adults^{10, 11}, therefore household activity alone
88 or walking alone was not classified as a structured program.

89

90 iii. Participants' self-perceived barriers to engaging in structured exercise and their recall
91 of recommendations to engage in exercise at or after discharge

92 Response options for items ii) and iii) (shown in table 3) consisted of a multiple choice
93 format and additional open-ended response. These items were measured at 6 months
94 following hospital discharge using a telephone survey conducted at the conclusion of each
95 participant's time in the study.

96

97 Other data collected at discharge were age, gender, medical diagnosis on admission,
98 discharge destination (community alone, community with partner, community with other,
99 residential care facility), length of stay in hospital, whether or not the participant fell during
100 hospital admission, mobility status on discharge (independently mobile, independently
101 mobile with aid, other), visual impairment (presence or absence of glaucoma, cataracts
102 (untreated) or age-related macular degeneration), cognitive status using the Short Portable
103 Mental Status Questionnaire (SPMSQ),³³ mood using the Geriatric Depression Scale,³⁴ and
104 highest education level attained (primary, secondary, technical college, university).

105

106 Procedure

107

108 Research assistants collected discharge measures for each participant within 48 hours of
109 discharge from hospital and administered the face to face survey, in an interview prior to the
110 participant's discharge. The research assistants did not offer any information about exercise
111 or ask participants about their proposed participation in exercise or other activities, so as not
112 to artificially prompt participation. Participants were telephoned at 6 months following
113 discharge from hospital and administered the telephone survey. Open ended responses

114 allowed the research assistants to clarify the type of exercise program reported. Participants
115 with cognitive impairment were able to be assisted by their support person or carer to respond
116 to the discharge survey and telephone survey, and research assistants clarified participants'
117 responses with their support person if required. After completing the final survey, participants
118 were given information about local falls prevention programs and if required, assistance to
119 contact the relevant program providers.

120

121 Statistical analysis

122

123 Baseline characteristics of participants were analyzed using descriptive statistics.

124 Associations between independent and dependent variables were explored using univariable

125 logistic regression analyses. The dependent variable was whether the participant had engaged

126 in exercise following discharge. The analysis considered two definitions for engagement in

127 exercise. The first was whether participants had commenced and sustained engagement in

128 exercise for the 6 months following discharge. The second was whether participants had

129 commenced but not sustained their engagement in exercise in the 6 months following

130 discharge. Univariable regression analyses were conducted for these two dependent variables.

131 The independent variables were participants' demographic characteristics, such as age and

132 diagnosis, participants' attitudes and beliefs about falls such as their self-perceived risk of

133 falls and self efficacy to reduce their falls risk, and whether participants recalled that a health

134 professional had recommended that they engage in exercise. A multiple regression model that

135 adjusted for each participants' time in the study after discharge was then constructed using a

136 model building process described by Hosmer and Lemeshow.³⁵ Independent variables with an

137 association below a pre-determined criteria ($P=0.25$) were entered into the preliminary

138 multivariable model. A backwards stepwise procedure was then used to reduce the number of

139 predictors within the multivariable model until all remaining predictors had associations with
140 $P < 0.05$. The preliminary model was tested for goodness of fit using Chi square statistic and
141 finally all borderline variables were added back into the model to check for significance. The
142 final model contained only independent variables with an association of $P < 0.05$.

143

144 Data for the whole cohort were analyzed first then sub group analyses were performed to
145 identify any association between the randomized groups in the larger hospital RCT and
146 engagement in exercise. Data management and analysis were completed using Stata version
147 10.0 software (StataCorp, Texas).

148

149 Data obtained from survey items that required verbatim responses were coded using
150 qualitative description,³⁶ whereby the data were presented using quantitative summary
151 (number and percentages) combined with qualitative description of participants' responses.
152 The principal investigator separated verbatim responses with multiple themes into individual
153 response items and coded items using the direct wording of the response to group similar
154 emerging themes into categories.³⁷ Categories were labeled according to how the responses
155 conceptualized the barriers that prevented participants' engagement in exercise and responses
156 within each category were broken down into smaller concepts. Categories and concepts were
157 reviewed by two other investigators before final labeling. Finally data were re-examined by
158 the three investigators to evaluate whether the final categories and concepts adequately
159 described all participants' responses. Any disagreements were arbitrated by a fourth
160 investigator.

161

162 This study was approved by the local hospital ethics committee and The University of
163 Queensland Medical Research Ethics Committee.

164 Results

165

166 There were 350 participants enrolled in the RCT at the study site. Of these 350, 6
167 participants died and one withdrew in hospital leaving 343 participants in the discharge
168 cohort. Participants' characteristics are presented in table 1. There were 90 (26.2%)
169 participants who were classified as having cognitive impairment based on scoring less than 8
170 out of 10 on the SPMSQ.³³ The research assistants interviewed 333 (97.1%) of the
171 participants at discharge to administer the survey. Ten participants were unable to be
172 interviewed because of earlier than anticipated discharge from hospital. During the 6 month
173 follow-up period, 27 participants died, 7 participants were lost to follow up and 4 participants
174 withdrew from the study. Therefore 305 participants were administered the final survey.

175

176 Participants' responses to the survey that examined awareness and self-perceived risk of falls
177 and self efficacy to reduce risk of falls are presented in table 2. Only 3.6% of participants
178 disagreed or strongly disagreed that an older person could sustain a serious injury if they fell,
179 but 39.3% disagreed or strongly disagreed that they personally would sustain a serious injury
180 if they fell. Participants' reported engagement in exercise when surveyed at the 6 month point
181 following discharge is presented in table 3. There were 109 (35.7%) of the remaining 305
182 participants who reported that they were engaging in exercise when surveyed at 6 months
183 after hospital discharge.

184

185 Univariable logistic regression analyses (shown in table 4) demonstrated that participants
186 were significantly more likely to be engaging in exercise if they were living with a partner,
187 recalled the physiotherapist recommending that they do exercise and perceived at discharge
188 that they could sustain a serious injury if they fell. Participants were significantly less likely

189 to be engaging in exercise if they lived alone or could not recall that a health professional,
190 such as a physiotherapist or doctor had recommended that they engage in exercise. There was
191 no significant association between participants' age, gender, medical diagnosis, education,
192 visual impairment, cognition, mood or use of a walking aid at discharge, falling in hospital
193 and participants' engagement in exercise.

194

195 When analyses were repeated the dependent variable being whether the participant had
196 commenced but not sustained their engagement in exercise during the 6 months following
197 discharge, there was one change to the association between independent and dependent
198 variables. This was that participants who reported completing education to secondary school
199 level were significantly less likely to engage in exercise [odds ratio 0.65, 95% confidence
200 interval= 0.42, 1.00, *P*-value=0.05].

201

202 Multivariable analysis (shown in table 5) indicated that independent predictors of
203 engagement in exercise were if participants were living with a partner, if participants recalled
204 their physiotherapist recommending that they do exercise and perceived that they could
205 sustain a serious injury if they fell. Participants were less likely to engage in exercise if they
206 only perceived that they would sustain a mild injury (such as a skin cut or bruise) if they fell.
207 The multivariable model correctly classified 68.31% of the predicted participation in exercise
208 (sensitivity 32.14%, specificity 87.32%, positive predictive value 57.14%, negative predictive
209 value 70.99%).

210

211 There was no association between group allocation in the RCT and engagement in exercise
212 programs after discharge, indicating that the falls prevention inpatient education intervention
213 was unlikely to be associated with engagement in exercise following discharge.

214

215 There were 188 (61.6%) participants who responded that they were not at present engaging in
216 exercise and of these 168 (89.4%) responded to the survey item that asked them to identify
217 one or more self - perceived barriers to engaging in exercise. This included 46 of the 54
218 participants who reported that they had commenced but not sustained their engagement in
219 exercise. Participants' responses (n=220, shown in figure 1) were classified into three major
220 categories according to the type of barrier reported: attitude (n=123, 55.9%), medical (n=67,
221 30.5%), program delivery (n=30, 13.6%).

222

223 Discussion

224

225 This study identified that older patients have low levels of engagement in exercise after
226 discharge and that self - perceived risk of injury from a fall and other social and emotional
227 factors affect engagement in exercise. Older patients also experienced numerous barriers to
228 engaging in exercise after discharge. The most frequently reported barriers included low self
229 efficacy, such as a belief that exercise was not necessary and medical barriers such as
230 experiencing pain on engaging in exercise.

231

232 Only 35% of participants surveyed reported participating in an exercise program following
233 discharge. This contrasts with evidence that older patients are at increased risk of falls during
234 this period^{1,2} and that exercise improves function and reduces falls in older populations.⁹⁻¹¹
235 Exercise programs most often consisted of one formal session per week which is below the
236 levels recommended to improve and maintain health in older adults.^{10, 11} Although 38
237 (12.4%) participants reported that they engaged in other physical activity, such as walking or
238 housework, these physical activities alone also do not meet the levels recommended for older
239 adults^{10, 11} and there is evidence that walking programs alone may increase the risk of falls.³⁸
240 About one third of participants engaged in exercise were attending a group and over half
241 were completing a home program. These findings confirm that older patients may require
242 choice of programs after discharge,¹⁷ such as group exercise which includes social support^{17,}
243 ³⁹ or a home program which may also be appealing.^{15, 19} A large community survey found that
244 while 36% of older people were willing to do home exercises only 22% were willing to
245 attend a group program¹⁹ and a study that prescribed falls prevention exercises reported that
246 completing home based exercises resulted in increased adherence and reduced drop out when
247 compared to a centre based program.⁴⁰

248

249 This is the first study to the authors' knowledge to examine older patients' beliefs about the
250 risk of falling and their engagement in exercise in the post discharge period. Responses
251 identified that 88% of participants agreed that a fall could result in a serious injury but only
252 53% agreed that they personally could sustain a serious injury from a fall. This was
253 noteworthy because the analysis indicated that only participants who believed that they were
254 at risk of serious injury were significantly likely to be engaging in exercise. Over three-
255 quarters of participants agreed that older people were at risk of falls following discharge but
256 only 37% thought that they were personally at risk and even personal awareness of risk did
257 not predict engagement in exercise. These two results support the premise of the HBM which
258 postulates that even when people are aware of the risk to health, they need to perceive that the
259 threat to their health is serious enough to warrant behavior change.²⁷ These findings are also
260 supported by studies conducted in community populations which have reported that older
261 people were aware of falls prevention messages but viewed the information as not personally
262 relevant and rated their own personal risk of falls as low.^{16, 41}

263

264 Participants who lived at home with a partner were significantly more likely to be engaging
265 in exercise and those who reported that they had been recommended to do exercise by the
266 hospital physiotherapist were nearly twice as likely to be engaging in exercise following
267 discharge. A previous study conducted in a falls clinic reported that low adherence to
268 prescribed exercises was associated with living alone.⁴² Other studies have identified that
269 older peoples' engagement in exercise is improved with support and peer encouragement^{39, 43,}
270 ⁴⁴ and that recommendations by a health professional are associated with uptake of
271 exercise.^{19, 43} These findings may also be explained by the HBM in two ways. First
272 recommendations to commence exercise may be an important cue to action. Second,

273 encouragement from a physiotherapist or the participants' partner may have facilitated
274 development of participants' self efficacy to engage in exercise. Since older patients who
275 have been recently discharged from hospital are at high risk of falls, functional decline and
276 onset of disability^{1, 4, 6} this population may need individualized training to successfully
277 engage in exercise. Programs that have provided individualized falls prevention exercise
278 instruction delivered by a physiotherapist reported a greater than 50% adherence to exercise
279 in high risk populations.^{14, 22, 42} Additionally since some participants could not recall advice
280 and identified that limited awareness or availability of relevant programs prevented
281 engagement in exercise, program delivery may also form a barrier to the translation of
282 research evidence about falls prevention into practice.⁴⁵ Staff may require education to
283 provide formal recommendations and education for patients at discharge, as well as
284 structured program delivery that enhances older patients' ability to engage in exercise after
285 discharge.

286

287 The barrier to engagement in exercise that was most frequently identified by participants was
288 attitude to exercise, including low self efficacy, believing that exercise was unnecessary,
289 dislike of exercise and being too fearful to engage in exercise. These attitudes have also been
290 reported in studies in general community populations.^{15, 16, 25, 26} The HBM theorises that
291 health providers should explore older peoples' attitudes and beliefs about their risk of falls to
292 aid in providing tailored education that alerts older people to the risk of falls, provides
293 information about the potential benefits of engaging in exercise and aids in development of
294 self efficacy to engage in exercise.²⁷ Additionally about one third of participants who were
295 not exercising identified medical barriers to exercise such as pain, even at 6 months after
296 discharge. Medical problems have been described as barriers to engaging in falls prevention
297 programs and physical activity in general older populations.^{17, 18, 26} Patients may need

298 ongoing support following discharge to overcome medical barriers that prevent engagement
299 in exercise and other physical activities. Other studies have concluded that older patients
300 require additional rehabilitation after discharge,⁵ and that more attention is required to ensure
301 effective transition from hospital to home^{8,46} and promote increased activity levels after
302 hospitalization.⁴ Further studies are required to confirm the factors that were identified in this
303 study as facilitating engagement in exercise programs in this population.

304

305 Study limitations

306

307 The findings of this study are strengthened by the high rate of follow up and the detailed
308 information about what exercise participants were engaged in when surveyed. However the
309 multivariable model did not fully explain participants' engagement in exercise. Limitations of
310 this study were that it did not examine the influence of previous exercise habits on exercise
311 post-discharge which has been found to facilitate engagement in exercise in other
312 populations.^{16,17} Additionally, patient-level data that identified the exact nature of the
313 exercises and advice provided for each participant was not collected. Other variables such as
314 these may need to be added to this model to enhance its ability to predict participation in
315 exercise in this population. The generalisability of the results may also be limited as
316 participants were recruited from a single hospital.

317

318 Conclusions

319

320 Older patients have low levels of engagement in exercise following discharge although they
321 are at increased risk of functional decline and falls during this period.^{1,6} This study identified
322 barriers and facilitators to engagement in exercise during this period that can be used by

323 researchers and clinicians to develop and evaluate suitable education and exercise
324 interventions for this population. Health care workers who treat older patients in the post
325 discharge period should highlight falls risk, address low self efficacy and other barriers to
326 engagement in exercise and specifically recommend that their patients engage in exercise
327 programs.
328

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Conflict of Interest

No commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit on the authors or on any organization with which the authors are associated

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Table 1. Demographic characteristics of participants at point of discharge from hospital

Characteristic	Total sample (n=343)
Age (years), mean±SD	79.4 ±8.5
Female, n (%)	210 (61.2)
Average length of stay in hospital (days), mean±SD	26.7±27.9
Fall during hospital admission, n (%)	44 (12.8)
Visual impairment, n* (%)	101 (29.4)
Discharge destination, n (%)	
Community alone	114 (33.2)
Community with partner	131 (38.2)
Community with other	40 (11.7)

Residential care facility	58 (16.9)
Mobility, n (%)	
Uses no aid	130 (37.9)
Uses walking aid	182 (53.1)
Other (uses wheelchair/requires assistance)	31 (9.0)
Mood (GDS), [†] mean±SD	4.3± 2.8
Cognition	
SPMSQ, [‡] mean±SD	8.4±2.0
<u>SPSMQ <8, n (%)</u>	<u>90 (26.2)</u>
<u>SPMSQ >8, n (%)</u>	<u>252 (73.8)</u>
Diagnosis, n (%)	
Stroke	33 (9.6)
Other neurological	18 (5.2)
Orthopaedic	51 (14.9)
Cardiac	24 (7.0)

Pulmonary	70 (20.4)
Other geriatric management	75 (21.9)
Other surgery	22 (6.4)
Other medical condition	34 (9.9)
Other (including arthritis, major trauma)	16 (4.7)
Highest education level attained	
Primary	104 (30.5)
Secondary	172 (50.4)
Technical college	48 (14.1)
University	17 (5.0)

*Includes cataracts (untreated), macular degeneration, glaucoma

†Geriatric Depression Scale, range 1-15, score greater than 4 indicates presence of depressive symptoms

‡Short Portable Mental Status Questionnaire, range 1-10, greater score indicates better cognitive function

[§]Euro qol visual analogue scale, range 0-100, higher indicates better self perceived health related quality of life

Table 2. Participants' awareness, self perceived risk of falls and self efficacy to reduce their risk of falls at point of discharge

Item	Item wording	Strongly agree n (%)	Agree n (%)	Undecided n (%)	Disagree n (%)	Strongly disagree n (%)
1	I think that older people who go home from hospital are at risk of falling over in the first 6 months	78 (23.4)	183 (55.0)	46 (13.8)	25 (7.5)	1 (0.3)
2	I think that I will fall over at some point in the first 6 months after I return home	36 (10.8)	93 (28.0)	22 (6.6)	134 (40.2)	48 (14.4)
3	I think that if a person falls over at home they are likely to get a mild injury (such as a skin cut or a bruise)	135 (40.7)	177 (53.3)	11 (3.3)	9 (2.7)	

4	I think if I were to fall over I would be likely to get a mild injury (such as a skin cut or a bruise)	127 (38.3)	160 (48.2)	10 (3.0)	32 (9.6)	3 (0.9)
5	I think that if an older person falls over at home they are likely to get a serious injury (such as a sprain, bumped head or broken bone)	147 (44.3)	147 (44.3)	26 (7.8)	12 (3.6)	
6	I think that if I were to fall over in the first 6 months after going home from hospital, I would be likely to get a serious injury (such as a sprain, bumped head or broken bone)	75 (22.6)	103 (31.0)	22 (6.6)	115 (34.7)	17 (5.1)
7	I am confident that I could engage (in identified strategies) to prevent myself from falling when I went home from hospital	166 (50.0)	139 (41.9)	18 (5.4)	8 (2.4)	1 (0.3)
8	I am very motivated to lower my risk of falls at home in the first 6 months after hospitalization by	226 (69.5)	77 (23.7)	8 (2.5)	13 (4.0)	1 (0.3)

using these strategies (referring to strategies that the participant has identified)

Table 3. Participants' engagement in exercise in 6 months following hospital discharge

Item	Item wording	Response n (%)
1	<p>Participating in exercises aimed at improving balance and strength is recognized as a way to reduce the risk of falling. Can you remember being told that you should do exercise to improve your balance and strength by anyone either while you were in hospital or after you left?</p> <p>Don't remember anyone telling me</p> <p>Hospital physiotherapist told me at discharge</p> <p>Other health care worker (e.g. GP, Dr in hospital) told me at discharge or in the 6 months after discharge</p>	<p>58 (19)</p> <p>221 (72.5)</p> <p>22 (7.2)</p>

	No response	4 (1.3)
2	Have you performed an exercise programme aimed at improving strength and balance since you left the hospital 6 months ago?	
	Yes have done at least once/week	109 (35.7)
	Not immediately after discharge but doing now	19 (6.2)
	Was but not now	54 (17.7)
	Not now but intend to	20 (6.6)
	Not now and do not intend to	95 (31.2)
	No response	8 (2.6)
3	Please describe how you have been doing these exercises	
	Group run by health care worker (most often once/week in community physiotherapy programme)	43 (39.4)

Group run by other activity provider (most often once/week such as dancing class, yoga)	6 (5.5)
Supervised individual home programme (physiotherapist visit; most often once/week)	8 (7.4)
Unsupervised home programme originally prescribed by health care worker (most often by physiotherapist)	34 (31.2)
Unsupervised home programme devised by participant/other	16 (14.7)
No response	2 (1.8)

Table 4. Univariable analysis: Associations between variables of interest and participants' engagement in exercise at 6 months following discharge

Independent variable of interest	Unadjusted odds ratio, (95% confidence interval), <i>P</i> -value
Participant characteristics	
Age	1.00, (0.96, 1.02), 0.55
Gender	1.00, (0.61, 1.55), 0.92
Fall during hospital admission	1.21, (0.62, 2.34), 0.57
Discharge destination	
Community alone	0.56, (0.33, 0.95), 0.02
Community with partner	1.76, (1.11, 2.79), 0.02

Community with other	0.66, (0.31, 1.39), 0.28
Mood (GDS) [*]	0.99, (0.92, 1.08), 0.87
Cognition (SPMSQ) [†]	1.07, (0.94, 1.20), 0.27
Uses walking aid at discharge	1.50, (0.95, 2.37), 0.08
<u>Admission ward (rehabilitation vs acute)</u>	1.25, (0.79, 1.98), 0.35
Survey items at point of discharge*	
I think older people could fall over in 6 months after discharge	1.01, (0.78, 1.34), 0.13
I think I could fall over in the 6months after discharge from hospital	1.03, (0.87, 1.23), 0.37
I think older people could get a mild injury in the 6 months after discharge from hospital	1.00, (0.68, 1.36), 0.83

I think I could get a mild injury in the 6 months after discharge from hospital	1.09, (0.86, 1.39), 0.47
I think older people could get a serious injury in the 6 months after discharge from hospital	0.88, (0.65, 1.20), 0.42
I think I could get a serious injury in the 6 months after discharge from hospital*	0.72, (0.60, 0.87), 0.001
I am confident that I could. engage (in identified strategies) to prevent myself from falling when I went home from hospital	0.82, (0.59, 1.14), 0.23
I am very motivated to lower my risk of falls at home in the first 6 months after hospitalization by using these strategies (referring to strategies that the participant has identified)	0.90, (0.65, 1.23), 0.51

Survey items at 6 months following discharge

Participants could not remember being informed at discharge 0.43, (0.21, 0.86), 0.02
about performing exercise

Participants remembered physiotherapist informing them at 2.90, (1.71, 4.92), <0.001
discharge about performing exercise

*Geriatric Depression Scale, range 1-15, score greater than 4 indicates presence of
depressive symptoms

†Short Portable Mental Status Questionnaire, range 1-10, greater score indicates better
cognitive function

*Measured using Likert scale, range 1 to 5 where 1 indicates strongly agree with survey
item and 5 indicates strongly disagree with survey item

Table 5. Multivariable analysis: Associations between variables of interest and participants' engagement in exercise at 6 months following discharge

Independent Variable of Interest	Adjusted OR (95% CI), <i>P</i> (Adjusted for Time in Study Postdischarge)
Discharge destination, community with partner	1.97 (1.18–3.28), .009
Survey items at discharge	
I think I could get a mild injury in the 6 months after discharge from hospital.*	1.48 (1.09–2.01), .01
I think I could get a serious injury in the 6 months after discharge from hospital.*	0.61 (0.48–0.78), .001
Survey item at 6 months after discharge	
Participants remembered physiotherapist informing them at discharge about performing exercise.	1.93 (1.03–3.59), .04

Abbreviations: CI, confidence interval; OR, odds ratio.

*Measured using Likert scale; range, 1–5 where 1 indicates strongly agree with survey item and 5 indicates strongly disagree with survey item.

Figure 1. Participants' identified barriers to engagement in exercise

