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Title

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

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Abstract

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

Introduction

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

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

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

However the factors predicting older patients' engagement in exercise following hospital discharge are not known, in spite of the increased falls risk in this population. Potentially effective interventions such as exercise will have no effect if older people perceive insurmountable barriers to engaging in these recommended behaviors.²⁵ Therefore

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

Methods

Design

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

Participants and setting

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

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

Outcome measures

The primary outcome measures were:

i. Participants' attitudes and beliefs about falls

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

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

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

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

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

Procedure

Research assistants collected discharge measures for each participant within 48 hours of discharge from hospital and administered the face to face survey, in an interview prior to the participant's discharge. The research assistants did not offer any information about exercise or ask participants about their proposed participation in exercise or other activities, so as not to artificially prompt participation. Participants were telephoned at 6 months following discharge from hospital and administered the telephone survey. Open ended responses allowed the research assistants to clarify the type of exercise program reported. Participants with cognitive impairment were able to be assisted by their support person or carer to respond to the discharge survey and telephone survey, and research assistants clarified participants'

responses with their support person if required. After completing the final survey, participants were given information about local falls prevention programs and if required, assistance to contact the relevant program providers.

Statistical analysis

Baseline characteristics of participants were analyzed using descriptive statistics.

Associations between independent and dependent variables were explored using univariable logistic regression analyses. The dependent variable was whether the participant had engaged in exercise following discharge. The analysis considered two definitions for engagement in exercise. The first was whether participants had commenced and sustained engagement in exercise for the 6 months following discharge. The second was whether participants had commenced but not sustained their engagement in exercise in the 6 months following discharge. Univariable regression analyses were conducted for these two dependent variables. The independent variables were participants' demographic characteristics, such as age and diagnosis, participants' attitudes and beliefs about falls such as their self-perceived risk of falls and self efficacy to reduce their falls risk, and whether participants recalled that a health professional had recommended that they engage in exercise. A multiple regression model that adjusted for each participants' time in the study after discharge was then constructed using a model building process described by Hosmer and Lemeshow.³⁵ Independent variables with an association below a pre-determined criteria ($P=0.25$) were entered into the preliminary multivariable model. A backwards stepwise procedure was then used to reduce the number of predictors within the multivariable model until all remaining predictors had associations with $P<0.05$. The preliminary model was tested for goodness of fit using Chi square statistic and

finally all borderline variables were added back into the model to check for significance. The final model contained only independent variables with an association of $P < 0.05$.

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

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

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

Results

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

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

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

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

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

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

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

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

Discussion

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

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

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

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

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

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

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

Study limitations

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

Conclusions

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

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

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Legends

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

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

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

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

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

Figure 1. Participants' identified barriers to engagement in exercise

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 |
| SPSMQ <8, n (%) | 90 (26.2) |
| SPMSQ >8, n (%) | 252 (73.8) |
| 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, | 147 (44.3) | 147 (44.3) | 26 (7.8) | 12 (3.6) | |

bumped head or broken bone)

| | | | | | | |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|----------|------------|----------|
| 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 using these strategies (referring to strategies that the participant has identified) | 226 (69.5) | 77 (23.7) | 8 (2.5) | 13 (4.0) | 1 (0.3) |

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

| Item | Item wording | Response n (%) |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 1 | 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? | |
| | Don't remember anyone telling me | 58 (19) |
| | Hospital physiotherapist told me at discharge | 221 (72.5) |
| | Other health care worker (e.g. GP, Dr in hospital) told me at discharge or in the 6 months after discharge | 22 (7.2) |
| | 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, 0.39), 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 |
| Admission ward (rehabilitation vs acute) | 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 about performing exercise | 0.43, (0.21, 0.86), 0.02 |
| Participants remembered physiotherapist informing them at discharge about performing exercise | 2.90, (1.71, 4.92), <0.001 |

*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 odds ratio, (95% confidence interval), <i>P</i> -value (adjusted for time in study post discharge) |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Discharge destination, community with partner | 1.97, (1.18, 3.28), 0.009 |
| 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), 0.01 |
| I think I could get a serious injury in the 6 months after discharge from hospital* | 0.61, (0.48, 0.78), <0.001 |
| Survey item at 6 months following discharge | |
| Participants remembered physiotherapist informing them at discharge about performing exercise | 1.93, (1.03, 3.59), 0.04 |

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

