Fewer Emergency Readmissions and Better Quality of Life for Older Adults at Risk of Hospital Readmission: A Randomized Controlled Trial to Determine the Effectiveness of a 24-Week Exercise and Telephone Follow-Up Program

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Published

2009

Journal Title

Journal of the American Geriatrics Society

Version

Accepted Manuscript (AM)

DOI

https://doi.org/10.1111/j.1532-5415.2009.02138.x

TITLE

Reduced emergency readmissions and improved quality of life for older adults at risk of hospital readmission: A randomised controlled trial to determine the effectiveness of a 24 week exercise and telephone follow-up program.

Running Head

Reduced emergency readmissions for older adults

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ABSTRACT

Objective: To evaluate the effectiveness of an exercise-based model of hospital and in-home follow-up care for older people at risk of hospital readmission on emergency health service utilization and quality of life.

Design: Randomised controlled trial

Setting: Tertiary metropolitan hospital, Australia

Participants: 128 patients (64 intervention, 64 control) with an acute medical admission, aged >65 years and with at least one risk factor for readmission (multiple comorbidities, impaired functionality, aged >75 years, recent multiple admissions, poor social support, history of depression).

Intervention: Comprehensive nursing and physiotherapy assessment and individually tailored program including exercise strategies and nurse conducted home visit and telephone follow-up; commencing in hospital and continuing following discharge for 24 weeks.

Outcome measures: Emergency health service utilization (emergency hospital readmissions and visits to Emergency Department, General Practitioner, or allied health professional) and health related quality of life (SF-12v2™) collected at baseline and 4, 12 and 24 weeks following discharge.

Results: The intervention group required significantly less emergency hospital readmissions (22% of intervention group, 47% of control group, P=0·007); and emergency GP visits (25% of intervention group, 67% of control group, P<0·001). The intervention group also reported significantly greater improvements in quality of life in comparison to the control group as measured with SF-12v2™ Physical Component summary scores (F(3,279)=30·43, P<0·001) and Mental Component Summary scores (F(3,279)=7·20, P<0·001).

Conclusions: Early introduction of a tailored exercise program and long term telephone

follow-up may reduce emergency health service utilization and improve quality of life of older adults at risk of hospital readmission.

INTRODUCTION

Older people have significantly higher rates of hospital admission and readmission than the general population[1,2]. Persons aged 65 years or older account for 52% of hospital admissions in Australia[3] and approximately 36% in the U.K.[4] and the U.S.A.[5]. During an episode of hospitalisation, many older people experience functional decline and de-conditioning which impacts on their future independence and quality of life[6].

A variety of models have been designed to improve outcomes of hospitalized older persons, including geriatric management units, comprehensive assessment, discharge planning and discharge support arrangements[2,7]. However, evaluations of the effectiveness of these models report varying results. One review of discharge models for older adults encompassing both hospital and home follow-up reported reduced readmissions[8], while similar transitional models for patients with congestive heart failure also reported reduced readmissions[9,10]. However, systematic reviews have found insufficient evidence on the benefits of discharge planning[7], telephone follow-up[11], or exercise and case management interventions in reducing readmissions in this population[12,13].

Previously identified risk factors for hospital readmission from our pilot data and the literature include multiple comorbidities[14], impaired functionality[6,15], age[6,14], recent multiple admissions[14], poor social support[16,17] and a history of depression[14]. These known risk factors enable identification of a high risk population and can be incorporated into plans for interventions to reduce readmissions. In addition, exercise has been reported to be beneficial in reducing falls[18] and depression[19], while improving balance[18], walking capacity[13] and independence in activities of daily living[20]; although reviews on exercise for hospitalised older patients[21] and adults with heart failure[13] have found no significant reductions in

readmissions. Despite differing results, overall the literature suggests that exercise prescription and in-home follow-up may benefit the elderly and requires further investigation.

This study aimed to design, deliver and evaluate an innovative model of discharge planning and in-home follow-up care for older people at risk of hospital readmission. The new model aimed to specifically target older people with known risk factors for readmission and incorporated a tailored exercise program commencing in hospital and continuing for 24 weeks. This article reports results on hospital readmissions and emergency health service utilization and health related quality of life outcomes.

The results reported here are part of a larger study where the specific aims were to:

- determine the effectiveness of an intervention targeting patients at high risk of hospital readmission on emergency health service utilization, health related quality of life, general health, psychosocial outcomes, functional ability and cost-effectiveness; and
- evaluate the intervention in comparison to usual care on outcomes at 4, 12 and 24 weeks from discharge.

Hypotheses

- Participants in the intervention group would have lower rates of emergency health service utilization (hospital readmissions, Emergency Department (ED), emergency General Practitioner (GP) or allied health professional visits) than those in the control group;
- Intervention group participants would have improved health-related quality of life than control group participants.

METHODS

A randomised controlled trial was undertaken. Recruitment and data collection occurred from August 2004 – December 2006.

Sample

A sample of 128 participants was recruited within 72 hours of admission to medical wards at a tertiary referral hospital in Brisbane, Australia. Inclusion criteria were chosen based on previously published research identifying risk factors for readmission, as noted above.

Inclusion Criteria:

- Aged 65 years and over; AND
- Admitted with a medical diagnosis; AND
- At least one risk factor for readmission, i.e.:
    - 75 years or older;
    - multiple admissions in previous 6 months;
    - multiple comorbidities;
    - lived alone;
    - lacked social support;
    - poor self-rating of health:
    - moderate to severe functional impairment;
    - history of depression.

Exclusion criteria were based on patients' ability to participate in the planned intervention e.g. patients who were unable to walk independently or suffered a cognitive deficit would not be able to safely manage the intervention exercise program. This intervention was tailored to the population of older patients who are at known risk of readmission, yet still relatively

healthy and potentially able to live independently, as it was felt this group would particularly benefit from a relatively low resource-intensive preventive intervention.

Exclusion Criteria:

- required home oxygen;
- unable to walk independently for 3 meters (patients independently using walking aids were included); or
- had a neurological or cognitive deficit or disease.

Procedure

Participants were recruited within 72 hours of hospital admission. An information package on the study was provided and explained to potential participants and signed consent obtained from all participants. Baseline data was collected prior to randomisation and thus blinded. Following collection of baseline data, the research nurse at the clinical site contacted the project coordinator who was blinded to baseline data and randomly allocated participants via a computerised randomisation program to either the control or intervention group.

Control group

Participants in the control group received the routine care, discharge planning and rehabilitation advice normally provided. If in-home follow-up was necessary, it was organised in the routine manner (e.g. referral to community health services).

Intervention group

The intervention group, in addition to usual care, received an intervention following the *Older Hospitalised Patients' Discharge Planning and In-home Follow-up Protocol (OHP-*

DP), developed by the authors. The protocol commenced within 72 hours of admission and continued throughout hospitalization, transfer to home and in-home for six months.

Intervention OHP-DP Protocol:

Within 72 hours of admission a Registered Nurse (RN) and physiotherapist undertook a comprehensive patient assessment and developed a goal directed, individualised care plan in consultation with the patient, health professionals, family and caregivers. The care plan included:

a) Exercise intervention

An individually tailored exercise program prescribed by the physiotherapist included four components: muscle stretching, balance training, walking for endurance and muscle strengthening using resistance exercises. These components were based on literature findings indicating programs combining these elements were beneficial in this population[20]. The programs included:

Muscle stretching – stretching soft tissues of shoulder girdle, trunk, hamstrings and calf muscles; performed before and after resistance training and walking program.

Balance training – daily, to improve postural stability, including body sways, heel-raises, balancing with eyes closed, stepping tasks, walking a line and picking up an item from seated and standing position.

Walking - to enhance aerobic capacity and mobility, starting with a slow pace for 3-5 minutes, increasing to a moderate level for 5-10 minutes, followed by a slower pace; initially 2-3 times/week, increasing to 3-4 times/week. A pedometer was provided for participants and steps and distance were recorded in their diary.

Muscle strengthening - Resistance exercises for upper and lower body using Thera-Band® elastic bands performed 2-3 times/week, increasing to 3-4 times/week. Thera-Band® elastics

were trialled with the lowest level and progressed to higher levels depending on patient ability. Changing the prescribed colour over the study period was an option (i.e. progress to a higher level). Key muscle groups associated with activities of daily living and falls prevention were targeted, including elbow flexors and extensors, hip flexors, extensors and abductors and knee extensors (quadriceps). Contractions were held for 3-5 seconds, repeated 5 times for both limbs and progressively building to 2–3 sets of 10 repetitions. Exercises were rotated across limb segments to avoid excessive overload of individual regions and structures.

b) Nursing intervention whilst participant in hospital - The nurse visited daily during participants' hospital stay to address concerns, facilitate the exercise program and oversee discharge planning. Whilst the participant remained in hospital the nurse developed a transitional care plan covering the areas of functional ability and need for assistance with activities of daily living; post-discharge treatments and follow-up care; social support; chronic disease management plans and information; medication information; community services; and assistance with the exercise program. The nurse and physiotherapist combined their visits when planning, explaining, and demonstrating the exercise program to ensure continuity when the nurse continued to facilitate the exercise program during extended hospital stays and at home. Written guidelines were provided on post-discharge management, including diagrams and specific instructions for their exercise program.

c) Intervention following discharge - Within 48 hours of discharge, the nurse undertook a home visit to assess availability of support; address transitional concerns; provide advice and support; and ensure the exercise program could be safely undertaken at home. Extra home visits were provided if required. Weekly follow-up telephone calls were provided for 4 weeks followed by monthly follow-up for a further 5 months. The nurse was also available for

contact between 9am-5pm weekdays. During the telephone follow-ups feedback was sought on issues identified in hospital or during the home visit; general health; level of support available; management of treatment regimes, health promotion activities; any new problems or concerns; levels of adherence with the exercise program, and progress with the exercise plan and goals. These were adjusted to reflect progress or difficulties during the preceding time period and advice, information, positive feedback and support were offered.

Data Collection

Baseline data were collected on demographics, health and medical history from medical records prior to randomisation. Gait, balance and body strength and function were assessed using the Berg Balance Scale[22]; the Timed Up and Go Test[23]; an isometric muscle power test; and a 6 meter walk test. Self-administered questionnaires were used to gather baseline data on health related quality of life using the SF-12v2[24]. The 12 item version (SF-12) of the SF-36 reduces burden on participants, while the Physical Component Summary scale (PCS) and Mental Component Summary scale (MCS) of the SF-12 have been shown to be highly correlated with SF-36 PCS and MCS scores, valid in Australian populations and in older people, and valid for comparisons between groups to detect changes associated with physical and mental health[24,25]. The summary scores are on a 0-100 scale, and the minimal difference of clinical significance is suggested to be 5[26-28] or 10 points[29]. Follow up questionnaires including SF-12v2 and self-reported health care utilisation were administered via telephone at 4, 12 and 24 weeks from discharge by researchers blinded to participants' group allocation. The participating hospital's medical records were also searched for details of hospital admissions and visits to the Emergency Department to supplement the self-report health service utilisation data.

Statistical Analysis

Statistical procedures were performed using Statistical Packages for the Social Sciences version 13.0 (SPSS Inc., Chicago Il). Baseline data were analysed to check equality of groups using Chi square, Mann-Whitney U and *t* tests. Bivariate analysis on emergency health service utilization outcomes was undertaken using Fisher's exact tests and Mann-Whitney U tests. Logistic regression modelling was undertaken on emergency health service utilization outcomes to adjust for covariates known to impact on emergency readmissions and health service use. Repeated measures analysis of covariance (ANCOVA) was used to investigate differences in health-related quality of life outcomes. All analyses were conducted on an 'intention-to-treat' basis.

Ethics approval

This project was approved by the Queensland University of Technology Human Research Ethics Committee and the Mater Health Services Human Research Ethics Committee and complied with the Declaration of Helsinki rules for human experimentation.

RESULTS

The flow of participants through the study and reasons for loss to follow-up are shown in Figure 1. There was an overall attrition rate of 16% participants over the six months. Participants who withdrew or were lost to follow-up did not differ significantly from those who completed the study on baseline demographics, co-morbidities, risk factors for readmission or SF-12v2 scores. There were no adverse effects or accidents attributed to the exercise program. Only 4.7% (n=3) of the intervention group required a second home visit from the nurse providing the follow-up intervention. The purpose of all three extra visits was a need for further explanation and repeated demonstration of the exercise program, as the clients were too unwell at the first visit to remember instructions clearly. There was a moderate level of adherence to the exercise program throughout the six months, with 53% (n=31) of the intervention group undertaking their program all the time or nearly every day, and another 19% (n=11) doing their exercises 3-4 days week, while 28% (n=16) only did their exercises a little (2 or less days/week) or none of the time.

Demographic and medical information

Baseline demographic characteristics, admission diagnoses, comorbidities, and risk factors for readmission by group are displayed in Table 1. Females (62%) outnumbered males (38%). Participants' mean age (± standard deviation) was 78.8 (± 6.89) years. The most common diagnoses on admission were cardiac disease (27%); respiratory disease (26%); gastrointestinal problems (19%) and falls (14%). The median number of co-morbidities was 5 (range 0–12), including cardiac (78%), orthopaedic (48%), respiratory (49%), gastrointestinal (40%) and endocrine disease (38%). Mean duration of hospital stay was 4.6 (± 2.92) days. There were no significant differences between groups for age, gender, living arrangements, diagnosis, number and type of co-morbidities, or length of hospital stay.

The median number of risk factors for readmission found was 4 (range 1–8), with multiple co-morbidities (96%); age 75 years or older (66%); and functional impairment (60%) the most frequently reported factors. Risk factors for readmission are displayed in Table 1. There were no significant differences between the intervention and control groups for all but one of the risk factors - poor self-rating of health, with 65% of the intervention group compared to 47% of the control group identifying this factor ($\chi^2(1)=4.29$, $P=0.038$). ANCOVA and logistic regression were used to control for this difference in analysis of follow-up data.

Effect of intervention on emergency health service utilisation

Emergency health service utilization data included type of health service (hospital readmission, ED, GP or allied health), reason for the visit and total number of visits. In the 24 weeks following discharge, the intervention group required significantly less emergency hospital readmissions (22.0% of the intervention group, compared to 46.7% of the control group, $\chi^2(1)=7{\cdot}25$, *Phi*= -0.257, $P=0{\cdot}007$); and emergency GP visits (25.0% of the intervention group compared to 67.3% of the control group, $\chi^2(1)=18{\cdot}36$, *Phi*= -0.422, $P<0{\cdot}001$).

To adjust for the baseline difference between groups in the poor health self-rating risk factor (see Table 1), a multivariable logistic regression model was fitted to determine the independent influence of risk factors, age, gender, co-morbidities and group allocation on readmissions. After adjustment for all variables, group allocation (OR 0.14, 95% CI 0.04 – 0.44, $P=0.001$), presence of vascular disease (OR 7.15, 95% CI 2.21 – 23.09, $P=0.001$) and living alone (OR 0.23, 95% CI 0.08 – 0.65, $P=0.005$) remained significant independent risk factors for emergency readmissions. Intervention group participants were 7.2 times (95% CI

2.3–25.0) less likely to be readmitted than control group participants ; while participants with vascular disease were 7.1 times more likely to be readmitted than participants without vascular disease; and participants living alone were 4.3 times more likely to be readmitted than participants not living alone. All types of emergency health service utilisation over 24 weeks are shown in Figure 2.

Looking at number of readmissions, the intervention group had 21 readmissions compared to 49 in the control group (z=-2.3, P=0.03); and 13 emergency GP visits compared to 86 for the control group (z=-4.9, P<0.001). The most frequent reasons for hospital readmission in the intervention group were cardiac (6 of 21 readmissions, 28.6%), respiratory (4 of 21, 19.1%) or renal disease (3 of 21, 14.3%); and for the control group the reasons were cardiac disease (10 of 49 readmissions, 20.4%), unstable diabetes (9 of 49, 18.4%), respiratory (6 of 49, 12.2%) and renal disease (5 of 49, 10.2). Reasons for unplanned GP visits were similar in both groups and included pain (25.0%), chronic respiratory disease (16.0%) and falls or fainting (12.0%). Reasons for ED visits were also similar for the intervention and control groups and included collapse or falls (11 of 41 visits, 26.8%), chest pain (6 of 41, 14.6%) and congestive heart failure (6 of 41, 14.6%), with 14 and 27 visits respectively (z=-1.03, P=0.30). Numbers were small for emergency allied health service visits, with two visits from the intervention group versus 13 from the control group (z=-2.0, P=0.04).

Effect of intervention on health-related quality of life

Responses on the SF-12v2 standard (4 week recall) form were scored and aggregated into Physical Component Summary scores and Mental Component Summary scores as shown in Table 1. Repeated measures ANCOVA found a significant interaction effect with a higher increase in intervention group scores in comparison to control group scores for the PCS

($F(3,279)= 30{\cdot}4$, $\eta_p^2 =0.50$, $P<0{\cdot}001$) and MCS scores ($F(3,279)=7{\cdot}2$, $\eta_p^2 =0.19$, $P<0{\cdot}001$), (see Figure 3). Significant interaction effects were also found with the General Health subscale; Physical Function subscale; Role Physcial subscale; and the Bodily Pain Subscale scores. A sub-group analysis of PCS scores according to the four major admission diagnoses found all intervention participants, no matter which of these admission diagnoses, had a significant improvement in PCS scores and there was little difference in the effect size according to diagnostic groups, for example: those with cardiac disease ($\eta_p^2 =0.51, P<0{\cdot}001$); respiratory disease ($\eta_p^2 =0.46$, $P=0{\cdot}004$); gastrointestinal disease ($\eta_p^2 =0.52$, $P=0{\cdot}026$); and those admitted with falls ($\eta_p^2 =0.65, P=0{\cdot}018$).

DISCUSSION

This study aimed to evaluate the effectiveness of an exercise-based discharge planning and in-home follow up program (*OHP-DP* program) for at risk community living older people on emergency health service utilization and health-related quality of life. Analysis of the data suggests the *OHP-DP* program had significant benefits in both of these areas. The intervention was aimed at older adults with an acute hospital admission who were still living independently in the community prior to admission, yet with known risk factors for deconditioning and readmission, as this group is likely to obtain the greatest benefit from this preventive intervention. Over half (63%) of the admissions to the hospital's medical wards were 65 years or older, and approximately half of this group fitted the inclusion criteria. A cost effectiveness analysis of the intervention is warranted and is the next step to be undertaken.

Effectiveness of the intervention on emergency health service utilisation

The intervention group required significantly less emergency health service utilization following discharge, an outcome with considerable benefits for both patients and health service providers. The results from this sample indicate absolute reductions of 20% in hospital readmissions and 40% in emergency use of local General Practitioner medical services, supporting results from the World Health Organisation review, which found discharge plans for older people across the hospital-community interface are associated with reduced readmissions[2]. There was a non-significant difference between groups found in ED visits, although the intervention group still recorded less visits than the control group (14 vs 27 visits). Not all emergency readmissions were recorded as ED visits, as some patients were channelled through their GP into hospital rather than a direct admission through the ED

department; and one of the medical wards involved in the study was a short-stay unit situated in the ED, where patients are classified as in-patients.

Previous evaluations of telephone follow-up only interventions have had little effect on readmissions[8,11]; however, studies incorporating interventions across the hospital and community sectors and utilising a single professional for continuity of care, as in this study, have had greater successs[8,10]. Very few urgent calls were made to the nurse providing follow-up care to the intervention group. Instead, interventions frequently required by participants which may have impacted on emergency health service use included correction of misconceptions or lack of understanding on new medications provided during hospitalisation; identification of needs for referral for assistance (e.g. for home-help with housework/shopping, installation of bath or stair hand-rails, transport to attend medical appointments, social worker to assist finding housing etc.); and provision of health educational materials on chronic disease management. Overall, results from this study suggest that the positive outcomes found from short-term transitional care models for adults with congestive heart failure[9,10] are beneficial for a broader population of older adults with a range of chronic diseases. In addition, results from this study suggest that a longer six month intervention such as this may result in sustained reductions in readmissions and other emergency health service use. Lowering the use of acute care services is a key cost saving benefit that may be realised as a result of this intervention.

Effectiveness of the intervention on health-related quality of life

De-conditioning during hospitalisation in the elderly is reported to impact on independence and quality of life[6]. Exercise prescription is one strategy which may combat this and the provision of supportive follow-up care after discharge has been reported as improving quality

of life in older people[30]. In this study the intervention group receiving a combined exercise and follow-up intervention exhibited a significant improvement in health-related quality of life in comparison to the control group, supporting these findings. Older people are reported to prefer to exercise in their own home environment[31] and this factor may have contributed to the successful implementation of the program. The continued support from the research nurse in adapting the program from the hospital to home environment and providing long term encouragement and monitoring may also have contributed to beneficial outcomes. Previous studies have reported improvements in SF12 or SF36 measures from both exercise programs[13,32] and discharge follow-up support programs[9,30]. Within this study it is difficult to untangle the separate effects of the exercise component and the nurse follow-up component of the intervention, and further research is recommended to investigate this area.

Limitations

There were larger numbers of intervention group participants who withdrew from the study (6.3%) when compared to the control group (0%), which may result in some bias when interpreting results. Participants who withdrew from the study stated they felt too anxious or too unwell to cope with continuing the exercise intervention. In addition, measures of health-related quality of life and non-hospital health service use were obtained from self-report questionnaires, with the possibility of response bias. Just over a quarter (28%) of the intervention group were not compliant with the exercise program, which may have diluted the impact of the intervention on outcomes. Due to the practical constraints of this study, the sample was limited to patients who had the cognitive ability to understand the exercise program instructions, did not require home oxygen and had the ability to stand and walk independently, however, it is not inconceivable that the intervention could be modified to

include participants with more severe mobility deficits in the future.

Conclusions

In this sample of older people who were cognitively intact and able to walk independently; yet were identified as at risk of hospital readmission, the implementation of a 24 week exercise-based program of hospital and in-home follow-up care resulted in:

- A reduction in emergency health service utilization and;
- Improved health-related quality of life.

Further studies are needed to examine the optimal components of exercise programs and follow-up management in the home on health and economic outcomes. Recommendations for health professionals caring for this population include incorporation of a transitional care program over the hospital to home interface, including a tailored exercise program and regular follow-up for 6 months.

ACKNOWLEDGMENTS

The authors acknowledge Jan Armstrong for her assistance in preparing this article and the physiotherapy and nursing staff at the participating hospital for their contribution.

This study was funded by an Australian Research Council Discovery Project Grant.

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TABLES

Table 1. Baseline Demographic Characteristics, Admission Diagnoses, Comorbidities, and Risk Factors for Readmission

Characteristic	Intervention Group (n = 58)	Control Group (n = 64)	Total (n = 122)
Demographic			
Age, mean ± SD[†]	78.1 ± 6.3	79.4 ± 7.3	78.8 ± 6.9
Female (n, %)	36, 62%	40, 63%	76, 62%
Admission Diagnoses			
Cardiac disease (n, %)	17, 29%	16, 25%	33, 27%
Respiratory disease (n, %)	18, 31%	14, 22%	32, 26%
Gastro-intestinal (n, %)	11, 19%	12, 19%	23, 19%
Falls (n, %)	7, 12%	10, 16%	17, 14%
Comorbidities			
Cardiac disease (n, %)	46, 79%	49, 77%	95, 78%
Orthopaedic (n, %)	33, 57%	26, 41%	59, 48%
Respiratory (n, %)	30, 52%	30, 47%	60, 49%
Gastro-intestinal (n, %)	22, 38%	27, 42%	49, 40%
Endocrine (n, %)	21, 36%	25, 39%	46, 38%
No. of comorbidities (median, range)	5 (0 – 8)	4 (1 – 12)	5 (0 – 12)
Length of stay, mean ± SD	4.6 ± 2.7	4.7 ± 3.3	4.6 ± 2.9

Risk factors for readmission (n, %)			
Multiple comorbidities	56, 97%	61, 95%	117, 96%
75 years or older	37, 64%	44, 69%	81, 66%
Functional impairment	33, 57%	40, 62%	73, 60%
Lived alone	30, 52%	38, 59%	68, 56%
Poor self-rating of health*	38, 65%	30, 47%	68, 56%
Poor social support	17, 29%	20, 31%	37, 30%
History of depression	18, 31%	18, 28%	36, 29%
Multiple recent admissions	17, 29%	12, 19%	29, 24%
No. of risk factors (median, range)	4 (1 – 8)	4 (1 – 7)	4 (1 - 8)

*****$p < 0.05$

[†]SD = Standard Deviation

Table 2: Standardised Mean Summary Scores and Subscale Scores for the SF-12v2™. Scale: 0–100, where lower scores indicate poorer health-related quality of life

	PCS[‡]		MCS[§]	
	Intervention	**Control**	**Intervention**	**Control**
Time Period	**Mean ± SD[†]**	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
Baseline	32·6 ± 10·3	34·5 ± 10·6	46·2 ± 12·7	46·4 ± 10·6
4 weeks	39·4 ± 8·0	29·0 ± 9·2	56·5 ± 6·8	47·6 ± 9·2
12 weeks	42·5 ± 9·2	28·3 ± 10·1	59·2 ± 5·1	49·7 ± 7·4
24 weeks	43·8 ± 9·4	26·0 ± 9·9	59·4 ± 5·1	48·3 ± 7·7

[*] Interactions significant at $p<0{\cdot}001$ for both subscales, [†]SD = Standard Deviation,

[‡]PCS = Physical Component Summary, [§]MCS = Mental Component Summary

FIGURE LEGENDS

Figure 1: Flow of participants through study

Figure 2: Emergency health service utilization over 4 weeks and 24 weeks from hospital discharge.

GP=unplanned visit to General Practitioner; ED=Emergency Department visit; Readmission= emergency hospital readmission; Allied health=emergency visit to pharmacist/physiotherapist or other allied health professional;

*p <0·05, **p<0.005

Figure 3: Mean Physical Component Summary (PCS) scale scores for health-related quality of life

Higher scores indicate greater quality of life

Figure 1: Flow of Participants through Study

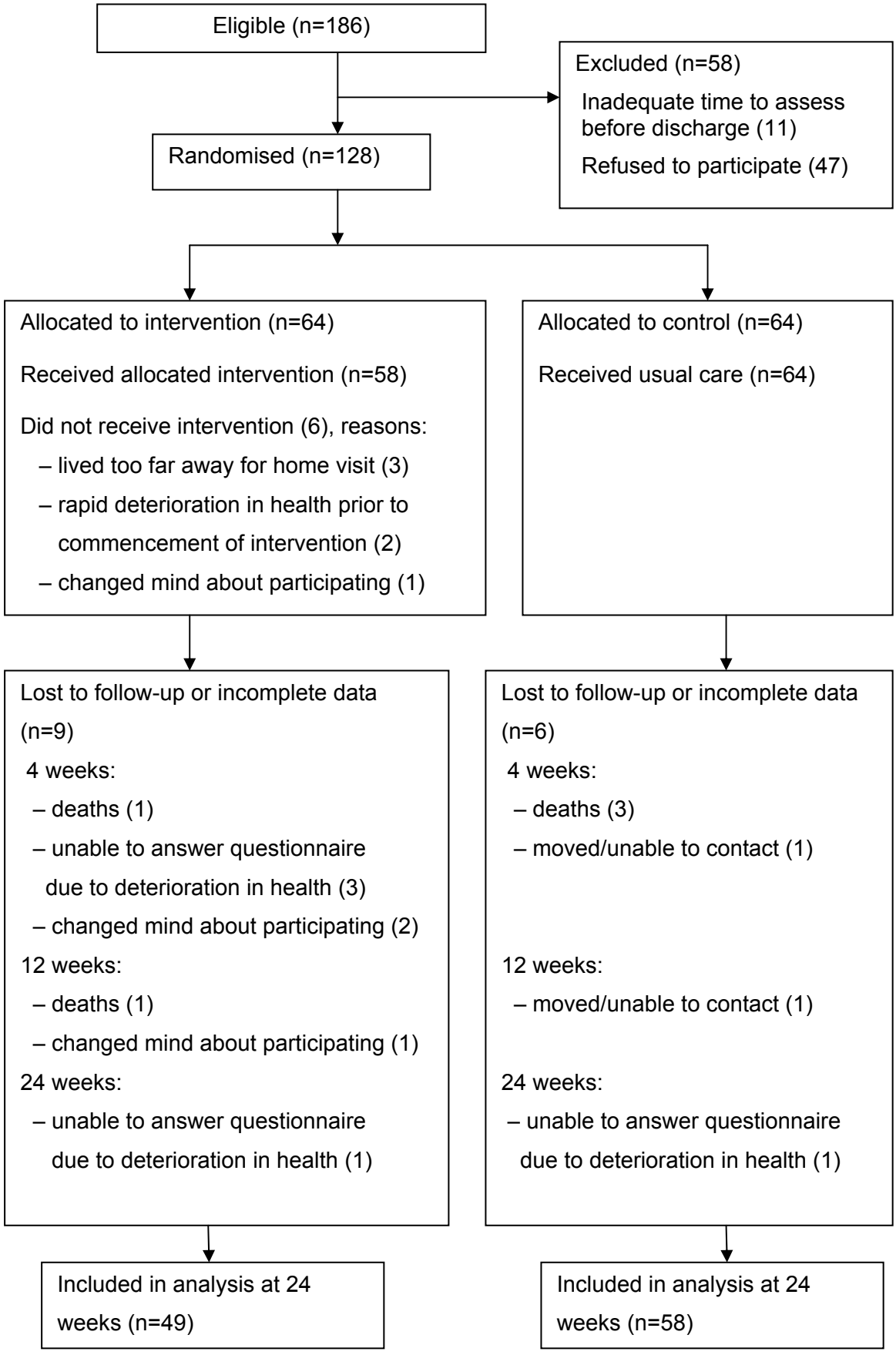

Figure 2: Emergency Health Service Utilization over 24 weeks from Hospital Discharge

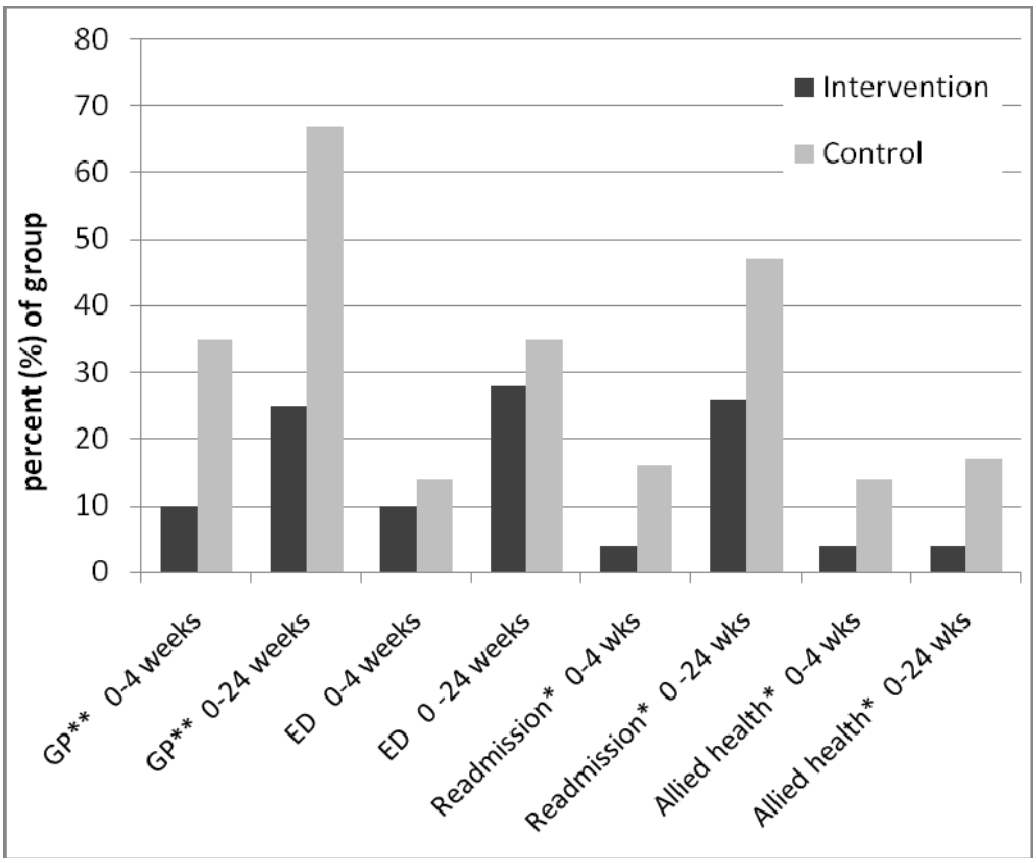

Figure 3: Mean Physical Component Summary (PCS) Scale Scores for Health-related Quality of Life