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Title page

Title

Early supported discharge for older adults admitted to hospital with medical complaints: a protocol for a systematic review

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Early supported discharge for older adults admitted to hospital with medical complaints: a protocol for a systematic review

Abstract

Introduction: Early supported discharge aims to link acute and community care, allowing hospital inpatients to return home and continue to receive the necessary input from healthcare professionals that they would otherwise receive in hospital. The concept has been researched extensively in the stroke population, showing reduced length of stay for patients and improved functional outcomes. This systematic review aims to explore the totality of evidence for the use of early supported discharge in an older adult population who have been hospitalised with medical complaints.

Methods: A systematic review of randomised controlled trials and quasi randomised control trials will be carried out in line with PRISMA guidelines. Studies will be included if they provide an early supported discharge intervention to older adults admitted to hospital for medical complaints compared to continuing inpatient care. MEDLINE, CINAHL, CENTRAL and EMBASE databases will be searched. The primary outcome measure will be length of hospital stay, secondary outcomes will include functional abilities, falls, quality of life, carer and patient satisfaction, unplanned emergency department re-presentation, unscheduled hospital readmission, nursing home admission or mortality. Titles and abstracts of studies will be screened independently by two authors. The Cochrane Risk of Bias Tool will be used independently by two reviewers to assess the methodological quality of the included studies. GRADE will be used to assess the quality of the body of evidence. A pooled meta-analysis will be conducted using RevMan software 5.4.1, depending on the uniformity of the data.

Ethics & Dissemination: The authors will present the findings of the review to a Patient and Public Involvement stakeholder panel of older people that has been established at the Ageing Research Centre in the University of Limerick. Formal ethical approval is not required for the review as all data collected will be secondary data and will be analysed anonymously.

PROSPERO Registration: CRD42021223112

Keywords: early supported discharge; older adults; hospitalised; systematic review; medical inpatient

Article Summary

Strengths and Limitations

- This is the first systematic review to synthesise the totality of evidence in relation to the effectiveness of ESD on clinical and process outcomes in hospitalised older adults with medical complaints
- Reporting is in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement
- ESD interventions for stroke, surgical and elective hospital admissions will not be included
- Robust and transparent methods used to identify, select, appraise and synthesise findings
- The Cochrane Risk of Bias Tool and the GRADE Framework used to assess methodological quality

Introduction

Globally, it is anticipated that the number of adults aged ≥ 65 years will increase from one billion in 2019, to 1.4 billion by 2030 and further increase to 2.1 billion by 2050 [1]. With an aging population globally, the number and frequency of older adults presenting to acute hospitals is increasing. These older adults are more likely to have multiple co-morbidities and as a result require more complex management. It is known that older adults are the largest consumers of healthcare resources, so as our global population ages, health services must adapt to support older adults in the hospital and community settings and across transitions of care [2].

Up to 60% of older adults who present to the emergency department (ED) are admitted for inpatient care as demonstrated in a retrospective cohort study of 550 older adults by Kennelly, Drumm [3]. Of those who were discharged home from the ED, 46.5% re-attended the ED within one year. Older adults functional ability is negatively correlated with older age and an increasing number of comorbidities [4]. In the two weeks prior to a hospital admission, half of older adults will have experienced a functional decline at home, most commonly assessed by their ability to carry out their activities of daily living [5]. Furthermore, a longer hospital length of stay (LoS) is associated with a greater likelihood of functional decline and reduced chances of recovering from the same. Loyd, Markland [6] reported that up to 30% (95% CI 24% - 33%) of older adults experience hospital associated disability in their meta-analysis of 15 longitudinal studies of older adults hospitalised in acute care. By reducing hospital length of stay for older adults, their functional abilities can be preserved and in turn reduce their risk of adverse outcomes such as falls or hospital re-admission.

Discharge interventions are used by healthcare professionals in the acute hospital setting to improve the discharge process for the both the patient and the health system [7]. The discharge intervention can occur pre-discharge while the patient is an inpatient such as pre-discharge home visits and multi-disciplinary team interventions, post-discharge in the person's discharge destination such as home-based interventions, telephone follow-up and educational supports or, a combination of both pre- and post-discharge which includes consultant review in the inpatient setting with community follow-up [8].

Braet, Weltens [8] made a grade A recommendation (strong evidence to support the recommendation from multiple high-quality studies) for discharge interventions in an adult population discharged from medical or surgical wards beginning pre-discharge and continuing

post-discharge following their systematic review of 47 studies, focusing specifically on reducing hospital re-admissions. There was a large variation in the interventions provided, which included individualised exercise programmes, telephone follow-up, home visits, follow-up appointments and educational programmes.

Early supported discharge (ESD) is a discharge intervention aimed at linking inpatient care and community services to allow patients to return home more than would be otherwise possible with community care, by receiving additional input from healthcare professionals [9]. ESD for people with acute stroke has been widely researched. A Cochrane review of 17 randomised control trials (RCT's) examining ESD in acute stroke care found it to decrease LoS by an average of six days, and also decrease admissions to long term care [9]. Those with mild-moderate disability (broadly defined as a Barthel Index score >9 on initial assessment) made the greatest improvements. The authors did note that ESD is only an effective discharge intervention when ESD teams are sufficiently resourced. No statistically significant changes were noted in terms of the patient's mood or their subjective health status. ESD has also been explored in surgical populations. Kapur, Thorpe [10] demonstrated a significant reduction in LoS among patients undergoing hip replacement in their controlled before-after study.

More recently, the impact of ESD has been examined on patient and process outcomes among older adults admitted to hospital with medical complaints. Parsons, Parsons [11] conducted a RCT where an ESD intervention was provided to 97 older adults who were able to stand/transfer with maximum assistance of one for a maximum of six weeks when compared to routine care (n = 86). The intervention resulted in an average reduction in LoS by six days versus the control group (mean difference = 5.9 days; 95% CI 0.6-11.3). Significant improvements were also observed in functional independence in patients.

The National Institute for Health and Care Excellence (NICE) published guidelines in 2015 focusing on the transition between acute and community care for older adults with social care needs [12]. The authors identified that families and carers can play an important role in the discharge process in terms of providing supplementary information about the patient's needs, which may decrease the risk of readmission to hospital. While carer outcomes (subjective health status, mood status and carer satisfaction) were analysed in the systematic review of ESD interventions for acute stroke care by Langhorne, Baylan [9], the role of carers in assisting with an ESD intervention was not explicitly noted. However, research demonstrates that involving caregivers in the discharge process can reduce the risk of readmissions in older adults

by 25% 90 days post discharge and 24% 180 days post discharge [13]. As per these NICE guidelines, ESD is a discharge intervention model that would potentially reduce the risk of readmission, while inevitably involving families/caregivers in a shared decision-making process.

From the literature discussed, it evident that ESD is well-established in the stroke population. The totality of evidence regarding the use of ESD in older adults hospitalised for medical reasons has not yet been reviewed. Therefore, the overall aim of this systematic review is to synthesise the evidence in relation to the effectiveness of ESD on clinical and process outcomes in hospitalised older adults with medical complaints.

Methods

Study Design

This protocol for a systematic review will be conducted in line with the PRISMA-P guidelines [14]. The systematic review will be reported following the PRISMA guidelines [15]. The Cochrane Handbook for Systematic Reviews of Interventions will be adhered to as appropriate [16].

Study Identification

Searches will be carried out in various databases including CINAHL in EBSCO, Cochrane Central Register of Controlled Trials in the Cochrane Library (CENTRAL), EMBASE and MEDLINE in EBSCO. MeSH terms and associated keywords will be used, covering broadly the topics of ESD, older adults and acute care and will be based off the search strategies used in Cochrane reviews carried out by Langhorne, Baylan [9] and Butterworth, Hays [17]. Sample search strategies can be seen in Appendices 1-4. Studies will be limited from the year 1997 onwards, as this was when the concept of ESD was introduced as an intervention in RCT's for stroke care [18, 19]. The reference lists of studies meeting the inclusion criteria will be hand reviewed for further relevant studies.

Studies will be included that meet the following inclusion criteria:

Population - older adults (>65 years) admitted to the acute care setting for medical reasons.

Intervention - ESD intervention, described as interventions aimed to accelerate patient discharge from hospital once medically stable, and providing patients with the necessary input in the community at the same level of intensity and resources they would receive while in the inpatient setting [9].

Control - usual care as described by study authors, other non-ESD interventions such as transfer to rehabilitation facilities or continuing multi-disciplinary team input in the inpatient setting, or an absence of ESD interventions.

Outcome - the primary outcome measure will be length of hospital stay. Secondary outcomes will include functional abilities (including Barthel Index), quality of life (including the SF-36), falls, injuries including fractures, carer and patient satisfaction, unplanned ED re-presentation, unscheduled hospital readmission, nursing home admission or mortality (the latter four outcomes measured by the number and frequency of each outcome as appropriate).

RCT's (including cluster trials) and quasi-RCT's will be included in this systematic review.

Exclusion Criteria

Studies will be excluded if their population is <65 years or have been admitted to hospital for non-medical reasons such as surgical/trauma or elective admissions. Stroke patients will also be excluded. Studies will also be excluded if the participants have only presented to the ED and have not experienced a subsequent hospital admission. Interventions will be excluded if they are not multi-disciplinary team led or are provided in step down facilities.

Study Selection

Studies will be downloaded in to Rayyan software and be screened against the inclusion criteria [20].

Two authors (SW and CO'R) will independently screen relevant studies by title and abstract. Studies that are selected by the reviewers as possibly meeting the inclusion criteria will undergo a full text review. If a disagreement occurs, both authors will meet to come to a consensus. In the event that an agreement cannot be reached, a third author will be consulted (A-MM).

Study Synthesis

Data will be independently extracted from the relevant studies by two reviewers (SW and A-MM). The information compiled will include study authors, year of publication, study population, interventions provided, controls provided, outcomes measured and duration of follow-up. Data describing the components of the ESD programmes will also be compiled in terms of resources allocated and service model used including inreach, outreach and discreet ESD models [21]. Data will be gathered into a pre-prepared Microsoft Excel document.

A pooled meta-analysis will be carried out where the data are homogenous, which will be determined by the outcomes measured and the time points accessed across the included studies. The effect size will be determined where the outcomes measured in the included studies measure the same construct. To do so, the mean and standard deviations from the appropriate outcomes will be extracted from both intervention and control groups in all relevant studies. The median and interquartile range will be used in the event that the mean and standard deviation is not available [22]. For continuous data we will calculate the treatment effect using standardised mean differences (SMD) and 95% CI where different studies used different scales for the assessment of the same outcome, and using mean differences (MD) and 95% CI where studies have all used the same method of measuring outcome. For dichotomous variables we will calculate the treatment effect using a fixed-effect/random-effect model and report it as risk ratios (RR) with 95% confidence intervals (CI). Authors will be contacted in the event data is not available. Data for the meta-analysis will be analysed using RevMan 5.4.1 Software [23].

Quality Assessment

Studies that meet the inclusion criteria will be assessed for risk of bias using the Cochrane Risk of Bias Tool [24]. Two independent reviewers (SW and RG) will assess the included studies for selection bias, performance bias, detection bias, attrition bias, reporting bias, other bias and the overall risk of bias.

The GRADE framework will be used to assess the quality of evidence for each outcome measured [16]. Two independent reviewers (SW and RG) will assess the quality of each outcome across risk of bias, imprecision, inconsistency, indirectness and publication bias. Outcomes will be graded at one of four levels of evidence - very low, low, moderate and high.

Although it may be considered a subjective measure in assessing quality of evidence, GRADE is a transparent and reproducible framework.

Patient and Public Involvement

The authors will present the findings of the review to a Patient and Public Involvement (PPI) stakeholder panel of older people that has been established at the Ageing Research Centre in the University of Limerick. The focus of this session will be to discuss the findings with this group so that the discussion section of the paper can integrate the views and opinions of older people.

Ethics & Dissemination

Subsequently, the review will be published in a relevant peer-reviewed journal, following the PRISMA standardised reporting guidelines and through relevant conferences [15]. Formal ethical approval is not required for the review as all data collected will be secondary data and will be analysed anonymously.

Study Status

Database searches have been completed.

Discussion

This review will synthesise the evidence relating to the effectiveness of ESD for older adults who are admitted to hospital with medical complaints. It is proposed that the ESD interventions included in this review will identify the necessary components of an ESD programme in terms of staffing and resources. This will enable recommendations to be made in terms of current and future ESD programmes following evidence-based practice.

By synthesising the evidence surrounding ESD in older adults and determining best practice, clinical and economic outcomes can be determined. There is potential for patient's LoS to be

reduced as is the case in stroke care. Reducing LoS could potentially reduce the risk of functional decline among older adults and further reduce their risk of readmission to hospital, the need for nursing home care or death [25]. Determining the impact of ESD on hospital bed days and overall hospital costs will inform policy makers. Establishing the impact on patient clinical outcomes will inform guideline development relating to processes which enable older adults to live in their community safely for longer.

Author Contributions

SW and RG were major contributors in writing the manuscript. SW, RG, A-MM and CO'R designed the overall study. SW developed the search strategy. All authors partcipated in critically appraising and editing the manuscript. RG is the guarantor of the review. All authors read and approved the final manuscript. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

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Conflicts of Interest

None declared.

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Appendix 1: Sample CENTRAL Search Strategy

#1 [mh 'aged']

#2 [mh 'aging']

#3 (late life OR elder* OR aged OR old age OR geriatric OR seniors): ti/ab/kw

#4 (old OR older OR aging OR aged OR senior OR elder*) NEAR/3 (person OR persons OR people OR adult* OR subject* OR patient* OR consumer* OR male OR males OR female* OR men OR women): ti/ab/kw

#5 (OR #1-#4)

#6 [mh 'patient discharge']

#7 [mh 'progressive patient care']

#8 [mh 'home care services']

#9 [mh 'home care services, hospital-based']

#10 [mh 'home nursing']

#11 (early supported discharge OR ESD): ti/ab/kw

#12 ((early OR earlier OR prompt OR accelerate* OR acute OR subacute OR supported) NEAR/5 discharg*): ti/ab/kw

#13 (reduce* NEAR/5 (duration OR length) NEAR/5 (stay OR hospital)): ti/ab/kw

#14 (reduce* NEAR/5 (hospital OR inpatient OR in-patient) NEAR/5 (stay OR care)): ti/ab/kw

#15 'short-term ward': ti/ab/kw

#16 ((organi?ed OR multidisciplinary) NEAR/5 discharge NEAR/5 team*): ti/ab/kw

#17 ((early OR earlier OR prompt OR accelerate* OR supported) NEAR/5 return* NEAR/2 home*): ti/ab/kw

#18 (hospital* NEAR/3 home*): ti/ab/kw

#19 'hospital rehabilitation unit*': ti/ab/kw

#20 (rehabilitation near/3 home*): ti/ab/kw

#21 (intensive NEAR/2 home NEAR/5 (rehabilitation OR support*)): ti/ab/kw

#22 (mobile NEAR/2 team*): ti/ab/kw

#23 ((post-discharge OR home rehabilitation) NEAR/5 (support* OR care)): ti/ab/kw

#24 ((early OR earlier OR acute OR subacute OR post-discharge) NEAR/5 (community OR domiciliary OR primary care OR home OR home-based) NEAR/5 (rehabilitation OR support* OR care)): ti/ab/kw

#25 (OR #6-#24)

#26 (#5 AND #25)

Appendix 2: Sample MEDLINE Search Strategy

1. exp aged

2. Aging

3. (Late life OR elder* OR aged OR old age OR geriatric OR seniors) ti/ab

4. ((old OR older OR aging OR aged OR senior OR elder*) N3 (person OR persons OR people OR adult* OR subject* OR patient* OR consumer* OR male OR males OR female* OR men OR women)) ti/ab

5. (1. OR 2. OR 3. OR 4.)

6. 'Patient Discharge' ti/ab

7. 'Progressive Patient Care' ti/ab

8. home care services OR home care services, hospital-based OR home nursing ti/ab

9. (early supported discharge OR ESD) ti/ab

10. ((early OR earlier OR prompt OR accelerate* OR acute OR subacute OR supported) N5 discharg*) ti/ab

11. (reduce* N5 (duration OR length) N5 (stay OR hospital)) ti/ab

12. (reduce* N5 (hospital OR inpatient OR in-patient) N5 (stay OR care)) ti/ab

13. 'short-term ward' ti/ab

14. ((organi?ed OR multidisciplinary) N5 discharge N5 team*) ti/ab

15. ((early OR earlier OR prompt OR accelerate$ OR supported) N5 return* N2 home*) ti/ab

16. (hospital* N3 home*) ti/ab

17. 'hospital rehabilitation unit*' ti/ab

18. (rehabilitation N3 home*) ti/ab

19. (intensive N2 home N5 (rehabilitation OR support*)) ti/ab

20. (mobile N2 team*) ti/ab

21. 'organi?ed home care' ti/ab

22. ((post-discharge OR home rehabilitation) N5 (support* OR care)) ti/ab

23. ((early OR earlier OR acute OR subacute OR post-discharge) N5 (community OR domiciliary OR primary care OR home OR home-based) N5 (rehabilitation OR support* OR care)) ti/ab

24. OR/6-23

25. 5 AND 24

26. randomi?ed controlled trials ti/ab

27. random allocation ti/ab

28. controlled clinical trials ti/ab

29. control groups ti/ab

30. clinical trials ti/ab

31. double-blind ti/ab

32. single-blind ti/ab

33. research design ti/ab

34. program evaluation ti/ab

35. randomi?ed controlled trial pt.

36. controlled clinical trial pt.

37. clinical trial pt.

38. random* ti/ab

39. (controlled N5 (trial* OR stud*)) ti/ab

40. (clinical* N5 trial*) ti/ab

41. ((control OR treatment OR experiment* OR intervention) N5 (group* OR subject* OR patient*)) ti/ab

42. (quasi-random* OR quasi random* OR pseudo-random* OR pseudo random*) ti/ab

43. ((control OR experiment* OR conservative) N5 (treatment OR therapy OR procedure OR manage*)) ti/ab

44. ((singl* OR doubl* OR tripl* OR trebl*) N5 (blind* OR mask*)) ti/ab

45. (assign* OR allocate*) ti/ab

46. controls ti/ab

47. trial ti/ab

48. OR/26-47

49. 25 AND 48

Appendix 3: Sample CINAHL Search Strategy

S1 (MH "Aged+")

S2 (MH "Aging+")

S3 TX (Late life OR elder* OR aged OR old age OR geriatric OR seniors)

S4 TX ((old OR older OR aging OR aged OR senior OR elder*) N3 (person OR persons OR people OR adult* OR subject* OR patient* OR consumer* OR male OR males OR female* OR men OR women))

S5 S1 OR S2 OR S3 OR S4

S6 (MH "Home Health Care") OR (MH "Home Rehabilitation+") OR (MH "Home Nursing")

S7 (TI ((early OR earlier OR prompt OR accelerate* OR acute OR subacute OR supported)) AND TI discharge*) OR (AB ((early OR earlier OR prompt OR accelerate* OR acute OR subacute OR supported)) AND AB discharge*)

S8 (TI reduce* AND TI ((duration OR length)) AND TI ((stay OR hospital))) OR (AB reduce* AND AB ((duration OR length)) AND AB ((stay OR hospital)))

S9 (TI reduc* AND TI ((hospital OR inpatient OR in-patient)) AND TI ((stay OR care))) OR (AB reduc* AND AB ((hospital OR inpatient OR inpatient)) AND AB ((stay OR care)))

S10 TI short-term ward OR AB short-term ward

S11 TI ((organi?ed OR multidisciplinary)) AND TI discharge AND TI team*

S12 (TI ((organi?ed OR multidisciplinary)) AND TI discharge AND TI team*) OR (AB ((organi?ed OR multidisciplinary)) AND AB discharge AND AB team*)

S13 (TI ((early OR earlier OR prompt OR accelerate* OR supported)) AND TI return* AND TI home*) OR (AB ((early OR earlier OR prompt OR accelerate* OR supported)) AND AB return* AND AB home*)

S14 TI ((hospital* AND home*)) OR AB ((hospital* AND home*))

S15 TI hospital rehabilitation unit* OR AB hospital rehabilitation unit*

S16 TI ((rehabilitation AND home*)) OR AB ((rehabilitation AND home*))

S17 (TI intensive AND TI home AND TI ((rehabilitation OR support*)))OR (AB intensive AND AB home AND AB ((rehabilitation or support*)))

S18 TI ((mobile AND team*)) OR AB ((mobile AND team*))

S19 TI organi?ed home care OR AB organi?ed home care

S20 (TI ((post-discharge OR home rehabilitation)) AND TI ((support* OR care))) OR (AB ((post-discharge OR home rehabilitation)) AND AB ((support* OR care)))

S21 (TI ((early OR earlier OR acute OR subacute OR post-discharge)) AND TI ((community OR domiciliary OR primary care OR home OR homebased)) AND TI ((rehabilitation OR support* OR care))) OR (AB ((early OR earlier OR acute OR subacute OR post-discharge)) AND AB ((community OR domiciliary OR primary care OR home OR home-based)) AND AB ((rehabilitation OR support* OR care)))

S22 S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21

S23 (MH "Randomized Controlled Trials") OR (MH "Random Assignment") OR (MH "Random Sample+")

S24 (MH "Clinical Trials") OR (MH "Intervention Trials") OR (MH "Therapeutic Trials")

S25 (MH "Double-Blind Studies") OR (MH "Single-Blind Studies") OR (MH "Triple-Blind Studies")

S26 (MH "Control (Research)") OR (MH "Control Group") OR (MH "Placebos") OR (MH "Placebo Effect")

S27 (MH "Crossover Design") OR (MH "Quasi-Experimental Studies")

S28 PT (clinical trial OR randomized controlled trial)

S29 TI (random* OR RCT OR RCTs) OR AB (random* OR RCT OR RCTs)

S30 TI (controlled N5 (trial* OR stud*)) OR AB (controlled N5 (trial* OR stud*))

S31 TI (clinical* N5 trial*) OR AB (clinical* N5 trial*)

S32 TI ((control OR treatment OR experiment* OR intervention) N5 (group* OR subject* OR patient*)) OR AB ((control OR treatment OR experiment* OR intervention) N5 (group* OR subject* OR patient*))

S33 ((control OR experiment* OR conservative) N5 (treatment OR therapy OR procedure OR manage*)) OR AB ((control OR experiment* OR conservative) N5 (treatment OR therapy OR procedure OR manage*))

S34 TI ((singl* OR doubl* OR tripl* OR trebl*) N5 (blind* OR mask*)) OR AB ((singl* OR doubl* OR tripl* OR trebl*) N5 (blind* OR mask*))

S35 TI (cross-over OR cross over OR crossover) or AB (cross-over OR cross over OR crossover)

S36 TI (placebo* OR sham) or AB (placebo* OR sham)

S37 TI trial

S38 TI (assign* OR allocat*) OR AB (assign* OR allocat*)

S39 TI controls OR AB controls

S40 TI (quasi-random* OR quasi random* OR pseudo-random* OR pseudo random*) OR AB (quasi-random* OR quasi random* OR pseudorandom* OR pseudo random*)

S41 S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40

S42 S5 AND S22 AND S41

Appendix 4: Sample EMBASE Search Strategy

1. aged

2. exp aging

3. (Late life OR elder* OR aged OR old age OR geriatric OR seniors) ti/ab/kw

4. ((old OR older OR aging OR aged OR senior OR elder*) NEAR/3 (person OR persons OR people OR adult* OR subject* OR patient* OR consumer* OR male OR males OR female* OR men OR women)) ti/ab/kw

5. OR/1-4

6. 'hospital discharge' ti/ab/kw

7. 'early supported discharge' ti/ab/kw

8. 'progressive patient care' ti/ab/kw

9. 'home care' OR 'home physiotherapy' OR 'home rehabilitation' ti/ab/kw

10. 'home environment' ti/ab/kw

11. 'community based rehabilitation' ti/ab/kw

12. (early supported discharge OR ESD) ti/ab/kw

13. ((early OR earlier OR prompt OR accelerate$ OR acute OR subacute OR supported) NEAR/5 discharg$) ti/ab/kw

14. (reduce$ NEAR/5 (duration OR length) NEAR/5 (stay OR hospital)) ti/ab/kw

15. (reduce$ NEAR/5 (hospital OR inpatient OR in-patient) NEAR/5 (stay OR care)) ti/ab/kw

16. short-term ward ti/ab/kw

17. ((organi?ed OR multidisciplinary) NEAR/5 discharge NEAR/5 team$) ti/ab/kw

18. ((early OR earlier OR prompt OR accelerate$ OR supported) NEAR/5 return$ NEAR/2 home$) ti/ab/kw

19. (hospital$ NEAR/3 home$) ti/ab/kw

20. hospital rehabilitation unit$ ti/ab/kw

21. (rehabilitation NEAR/3 home$) ti/ab/kw

22. (intensive NEAR/2 home NEAR/5 (rehabilitation OR support$)) ti/ab/kw

23. (mobile NEAR/2 team$) ti/ab/kw

24. organi?ed home care ti/ab/kw

25. ((post-discharge OR home rehabilitation) NEAR/5 (support$ OR care)) ti/ab/kw

26. ((early OR earlier OR acute OR subacute OR post-discharge) NEAR/5 (community OR domiciliary OR primary care OR home OR home-based) NEAR/5 (rehabilitation OR support$ OR care)) ti/ab/kw

27. OR/6-26

28. 'Randomi?ed Controlled Trial' ti/ab/kw

29. Randomi?ation ti/ab/kw

30. 'Controlled Study' ti/ab/kw

31. 'control group' ti/ab/kw

32. 'clinical trial' OR 'phase 1 clinical trial' OR 'phase 2 clinical trial' OR 'phase 3 clinical trial' OR 'phase 4 clinical trial' OR 'controlled clinical trial' ti/ab/kw

33. 'Double Blind Procedure' ti/ab/kw

34. 'Single Blind Procedure' OR 'triple blind procedure' ti/ab/kw

35. 'Parallel Design' ti/ab/kw

36. random$ ti/ab/kw

37. (controlled NEAR/5 (trial$ OR stud$)) ti/ab/kw

38. (clinical$ NEAR/5 trial$) ti/ab/kw

39. ((control OR treatment OR experiment$ OR intervention) NEAR/5 (group$ OR subject$ OR patient$)) ti/ab/kw

40. ((control OR experiment$ OR conservative) NEAR/5 (treatment OR therapy OR procedure OR manage$)) ti/ab/kw

41. ((singl$ OR doubl$ OR tripl$ OR trebl$) NEAR/5 (blind$ OR mask$)) ti/ab/kw

42. (assign$ OR alternate OR allocat$ OR counterbalance$ OR multiple baseline) ti/ab/kw

43. controls ti/ab/kw

44. trial ti/ab/kw

45. OR/28-44

46. 5 AND 27 AND 45

Reporting checklist for protocol of a systematic review.

Based on the PRISMA-P guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

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In your methods section, say that you used the PRISMA-Preporting guidelines, and cite them as:

Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart LA. Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015 statement. Syst Rev. 2015;4(1):1.

		Reporting Item	Page Number
Title			
Identification	#1a	Identify the report as a protocol of a systematic review	1
Update	#1b	If the protocol is for an update of a previous systematic review, identify as such	N/A - this is the first review of this intervention in this population group
Registration			
	#2	If registered, provide the name of the registry (such as PROSPERO) and registration number	2
Authors			
Contact	#3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical	1

		mailing address of corresponding author	
Contribution	#3b	Describe contributions of protocol authors and identify the guarantor of the review	10
Amendments			
	#4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	N/A
Support			
Sources	#5a	Indicate sources of financial or other support for the review	10
Sponsor	#5b	Provide name for the review funder and / or sponsor	N/A - no funding was given
Role of sponsor or funder	#5c	Describe roles of funder(s), sponsor(s), and / or institution(s), if any, in developing the protocol	N/A - no funding was given
Introduction			
Rationale	#6	Describe the rationale for the review in the context of what is already known	4-6
Objectives	#7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	6
Methods			
Eligibility criteria	#8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	6-7
Information sources	#9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	6

Search strategy	#10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	Appendices 1-4
Study records - data management	#11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	8
Study records - selection process	#11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	8
Study records - data collection process	#11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	8
Data items	#12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	8
Outcomes and prioritization	#13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	7-8
Risk of bias in individual studies	#14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	8-9
Data synthesis	#15a	Describe criteria under which study data will be quantitatively synthesised	8
Data synthesis	#15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I2, Kendall's τ)	8
Data synthesis	#15c	Describe any proposed additional analyses (such	8

		as sensitivity or subgroup analyses, meta-regression)	
Data synthesis	#15d	If quantitative synthesis is not appropriate, describe the type of summary planned	N/A
Meta-bias(es)	#16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	8-9
Confidence in cumulative evidence	#17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	8-9

Notes:

- 1b: N/A - this is the first review of this intervention in this population group
- 5b: N/A - no funding was given
- 5c: N/A - no funding was given
- 10: Appendices 1-4 The PRISMA-P checklist is distributed under the terms of the Creative Commons Attribution License CC-BY 4.0. This checklist was completed on 24. January 2021 using https://www.goodreports.org/, a tool made by the EQUATOR Network in collaboration with Penelope.ai

BMJ Open

Early supported discharge for older adults admitted to hospital with medical complaints: a protocol for a systematic review

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Title page

Title

Early supported discharge for older adults admitted to hospital with medical complaints: a protocol for a systematic review

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Early supported discharge for older adults admitted to hospital with medical complaints: a protocol for a systematic review

Abstract

Introduction: Early supported discharge (ESD) aims to link acute and community care, allowing hospital inpatients to return home and continue to receive the necessary input from healthcare professionals that they would otherwise receive in hospital. The concept has been researched extensively in the stroke population, showing reduced length of stay for patients and improved functional outcomes. This systematic review aims to explore the totality of evidence for the use of early supported discharge in an older adult population who have been hospitalised with medical complaints.

Methods: A systematic review of randomised controlled trials and quasi randomised controlled trials will be carried out in line with PRISMA guidelines. Studies will be included if they provide an early supported discharge intervention to older adults admitted to hospital for medical complaints compared to continuing inpatient care. MEDLINE, CINAHL, CENTRAL and EMBASE databases will be searched. The primary outcome measure will be length of hospital stay, secondary outcomes will include functional abilities, falls, quality of life, carer and patient satisfaction, unplanned emergency department re-presentation, unscheduled hospital readmission, nursing home admission or mortality. Titles and abstracts of studies will be screened independently by two authors. The Cochrane Risk of Bias Tool will be used independently by two reviewers to assess the methodological quality of the included studies. GRADE will be used to assess the quality of the body of evidence. A pooled meta-analysis will be conducted using RevMan software 5.4.1, depending on the uniformity of the data.

Ethics & Dissemination: The authors will present the findings of the review to a Patient and Public Involvement stakeholder panel of older people that has been established at the Ageing Research Centre in the University of Limerick. Formal ethical approval is not required for the review as all data collected will be secondary data and will be analysed anonymously.

PROSPERO Registration: CRD42021223112

Keywords: early supported discharge; older adults; hospitalised; systematic review; medical inpatient

Article Summary

Strengths and Limitations

- This is the first systematic review to synthesise the totality of evidence in relation to the effectiveness of ESD on clinical and process outcomes in older adults with an acute medical admission
- Reporting is in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement
- ESD interventions for stroke, surgical and elective hospital admissions will not be included
- Robust and transparent methods used to identify, select, appraise and synthesise findings
- The Cochrane Risk of Bias Tool and the GRADE Framework used to assess methodological quality

Introduction

Globally, it is anticipated that the number of adults aged ≥ 65 years will increase from one billion in 2019, to 1.4 billion by 2030 and further increase to 2.1 billion by 2050 [1]. With an aging population globally, the number and frequency of older adults presenting to acute hospitals is increasing. These older adults are more likely to have multiple co-morbidities and as a result require more complex management. It is known that older adults are the largest consumers of healthcare resources, so as our global population ages, health services must adapt to support older adults in the hospital and community settings and across transitions of care [2].

Up to 60% of older adults who present to the emergency department (ED) are admitted for inpatient care as demonstrated in a retrospective cohort study of 550 older adults by Kennelly, Drumm [3]. Of those who were discharged home from the ED, 46.5% re-attended the ED within one year. Older adults functional ability is negatively correlated with older age and an increasing number of comorbidities [4]. In the two weeks prior to a hospital admission, half of older adults will have experienced a functional decline at home, most commonly assessed by their ability to carry out their activities of daily living [5]. Furthermore, a longer hospital length of stay (LoS) is associated with a greater likelihood of functional decline and reduced chances of recovering from the same. Loyd, Markland [6] reported that up to 30% (95% CI 24% - 33%) of older adults experience hospital associated disability in their meta-analysis of 15 longitudinal studies of older adults hospitalised in acute care. By reducing hospital length of stay for older adults, their functional abilities can be preserved and in turn reduce their risk of adverse outcomes such as falls or hospital re-admission.

Early supported discharge (ESD) is an acute hospital discharge intervention aimed at linking inpatient care and community services to allow patients to return home more than would be otherwise possible with community care, by receiving additional input from healthcare professionals [7]. ESD for people with acute stroke has been widely researched. A Cochrane review of 17 randomised controlled trials (RCT's) examining ESD in acute stroke care found it to decrease LoS by an average of six days, and also decrease admissions to long term care [7]. Those with mild-moderate disability (broadly defined as a Barthel Index score >9 on initial assessment) made the greatest improvements. ESD has also been explored in surgical populations. Kapur, Thorpe [8] demonstrated a significant reduction in LoS among patients undergoing hip replacement in their controlled before-after study.

More recently, the impact of ESD has been examined on patient and process outcomes among older adults admitted to hospital with medical complaints. Parsons [9] conducted a RCT where an ESD intervention was provided to 97 older adults who were able to stand/transfer with maximum assistance of one for a maximum of six weeks when compared to routine care (n = 86). The intervention resulted in an average reduction in LoS by six days versus the control group (mean difference = 5.9 days; 95% CI 0.6-11.3). Significant improvements were also observed in functional independence in patients.

The National Institute for Health and Care Excellence (NICE) published guidelines in 2015 focusing on the transition between acute and community care for older adults with social care needs [10]. The guidelines highlight that families and carers can play an important role in the discharge process in terms of providing supplementary information about the patient's needs, which may decrease the risk of readmission to hospital. While carer outcomes (subjective health status, mood status and carer satisfaction) were analysed in the systematic review of ESD interventions for acute stroke care by Langhorne [7], the role of carers in assisting with an ESD intervention was not explicitly noted. However, research demonstrates that involving caregivers in the discharge process can reduce the risk of readmissions in older adults by 25% 90 days post discharge and 24% 180 days post discharge [11]. As per these NICE guidelines, ESD is a discharge intervention model that would potentially reduce the risk of readmission, while inevitably involving families/caregivers in a shared decision-making process.

From the literature discussed, it evident that ESD is well-established in the stroke population. The totality of evidence regarding the use of ESD in older adults hospitalised for medical reasons has not yet been reviewed. Therefore, the overall aim of this systematic review is to synthesise the evidence in relation to the effectiveness of ESD on clinical and process outcomes in hospitalised older adults with medical complaints.

Methods

Study Design

This protocol for a systematic review will be conducted in line with the PRISMA-P guidelines [12]. The systematic review will be reported following the PRISMA guidelines [13]. The

Cochrane Handbook for Systematic Reviews of Interventions will be adhered to as appropriate [14].

Study Identification

Searches will be carried out in various databases including CINAHL in EBSCO, Cochrane Central Register of Controlled Trials in the Cochrane Library (CENTRAL), EMBASE and MEDLINE in EBSCO. MeSH terms and associated keywords will be used, covering broadly the topics of ESD (e.g. 'early supported discharge' and 'home rehabilitation'), older adults (e.g 'aged' and 'aging') and acute care (e.g. 'hospital' and 'hospitalisation') and will be based off the search strategies used in Cochrane reviews carried out by Langhorne, Baylan [7] and Butterworth, Hays [15]. Sample search strategies can be seen in Appendices 1-4. Studies will be limited from the year 1997 onwards, as this was when the concept of ESD was introduced as an intervention in RCT's for stroke care [16, 17]. The reference lists of studies meeting the inclusion criteria will be hand reviewed for further relevant studies.

Studies will be included that meet the following eligibility criteria:

Population - older adults (≥65 years) admitted to the acute care setting for an acute medical admission.

Studies will be excluded if their population has been admitted to hospital for non-medical reasons such as surgical/trauma, stroke care or elective admissions. Studies whose participants only presented to the ED and did not have a subsequent hospital admission will also be excluded.

Intervention - ESD intervention, described as interventions aimed to accelerate patient discharge from hospital once medically stable, and providing patients with the necessary input in the community at the same level of intensity and resources they would receive while in the inpatient setting [7].

Interventions which are not MDT-led or are carried out in step-down facilities will be excluded.

Control - usual care as described by study authors, other non-ESD interventions such as transfer to rehabilitation facilities or continuing multi-disciplinary team input in the inpatient setting, or an absence of ESD interventions.

Outcome - the primary outcome measure will be length of hospital stay. Secondary outcomes will include functional abilities (including Barthel Index), quality of life (including the SF-36), falls, injuries including fractures, carer and patient satisfaction, unplanned ED re-presentation, unscheduled hospital readmission, nursing home admission or mortality (the latter four outcomes measured by the number and frequency of each outcome as appropriate). Studies measuring any one or more of the primary or secondary outcomes will be included.

RCT's (including cluster trials) and quasi-RCT's published from the year 1997 onwards will be included in this systematic review. Non-English articles will be included.

Study Selection

Studies will be downloaded in to Rayyan software and be screened against the eligibility criteria [18].

Two authors (SW and CO'R) will independently screen relevant studies by title and abstract. Studies that are selected by the reviewers as possibly meeting the inclusion criteria will undergo a full text review. If a disagreement occurs, both authors will meet to come to a consensus. In the event that an agreement cannot be reached, a third author will be consulted (A-MM).

Study Synthesis

Data will be independently extracted from the relevant studies by two reviewers (SW and A-MM). The information compiled will include study authors, year of publication, study population, interventions provided, controls provided, outcomes measured and duration of follow-up. Data describing the components of the ESD programmes will also be compiled in terms of resources allocated and service model used including inreach, outreach and discreet ESD models [19]. Data will be gathered into a pre-prepared Microsoft Excel document.

A pooled meta-analysis will be carried out where the data are homogenous, which will be determined by the outcomes measured and the time points accessed across the included studies. The effect size will be determined where the outcomes measured in the included studies measure the same construct. To do so, the mean and standard deviations from the appropriate outcomes will be extracted from both intervention and control groups in all relevant studies.

The median and interquartile range will be used in the event that the mean and standard deviation is not available [20]. For continuous data we will calculate the treatment effect using standardised mean differences (SMD) and 95% CI where different studies used different scales for the assessment of the same outcome, and using mean differences (MD) and 95% CI where studies have all used the same method of measuring outcome. For dichotomous variables we will calculate the treatment effect using a fixed-effect/random-effect model and report it as risk ratios (RR) with 95% confidence intervals (CI). Authors will be contacted in the event data is not available. Data for the meta-analysis will be analysed using RevMan 5.4.1 Software [21].

Quality Assessment

Studies that meet the inclusion criteria will be assessed for risk of bias using the Cochrane Risk of Bias Tool [22]. Two independent reviewers (SW and RG) will assess the included studies for selection bias, performance bias, detection bias, attrition bias, reporting bias, other bias and the overall risk of bias.

The GRADE framework will be used to assess the quality of evidence for each outcome measured [14]. Two independent reviewers (SW and RG) will assess the quality of each outcome across risk of bias, imprecision, inconsistency, indirectness and publication bias. Outcomes will be graded at one of four levels of evidence - very low, low, moderate and high. Although it may be considered a subjective measure in assessing quality of evidence, GRADE is a transparent and reproducible framework.

Patient and Public Involvement

The authors will present the findings of the review to a Patient and Public Involvement (PPI) stakeholder panel of older people that has been established at the Ageing Research Centre in the University of Limerick. The focus of this session will be to discuss the findings with this group so that the discussion section of the paper can integrate the views and opinions of older people. The PPI group was not involved in the protocol development due to challenges arisen from the COVID-19 pandemic.

Ethics & Dissemination

Subsequently, the review will be published in a relevant peer-reviewed journal, following the PRISMA standardised reporting guidelines and through relevant conferences [13]. Formal ethical approval is not required for the review as all data collected will be secondary data and will be analysed anonymously.

Study Status

Database searches have been completed.

Discussion

This review will synthesise the evidence relating to the effectiveness of ESD for older adults who are admitted to hospital with medical complaints. It is proposed that the ESD interventions included in this review will identify the necessary components of an ESD programme in terms of staffing and resources. This will enable recommendations to be made in terms of current and future ESD programmes following evidence-based practice.

Strengths of this systematic review will include the stringent methods used in accordance with the PRISMA guidelines. The use of multiple authors in the article screening and selection further strengthens this review. Limitations may include high levels of heterogeneity in the included studies which may affect the ability to carry out a meta-analysis. In the event of additional relevant search terms being identified during the search, all search strategies will be re-run to include the newly identified terms.

By synthesising the evidence surrounding ESD in older adults and determining best practice, clinical and economic outcomes can be determined. There is potential for patient's LoS to be reduced as is the case in stroke care. Reducing LoS could potentially reduce the risk of functional decline among older adults and further reduce their risk of readmission to hospital, the need for nursing home care or death [23]. Determining the impact of ESD on hospital bed days and overall hospital costs will inform policy makers. Establishing the impact on patient clinical outcomes will inform guideline development relating to processes which enable older adults to live in their community safely for longer.

Author Contributions

SW and RG were major contributors in writing the manuscript. SW, RG, A-MM and CO'R designed the overall study. SW developed the search strategy. SW, RG, A-MM, CO'R, MO'C, CP, ES, AL and FS participated in critically appraising and editing the manuscript. RG is the guarantor of the review. SW, RG, A-MM, CO'R, MO'C, CP, ES, AL and FS read and approved the final manuscript. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

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No funding was required.

Conflicts of Interest

None declared.

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Appendix 1: Sample CENTRAL Search Strategy

#1 [mh 'aged']

#2 [mh 'aging']

#3 (late life OR elder* OR aged OR old age OR geriatric OR seniors): ti/ab/kw

#4 (old OR older OR aging OR aged OR senior OR elder*) NEAR/3 (person OR persons OR people OR adult* OR subject* OR patient* OR consumer* OR male OR males OR female* OR men OR women): ti/ab/kw

#5 (OR #1-#4)

#6 [mh 'patient discharge']

#7 [mh 'progressive patient care']

#8 [mh 'home care services']

#9 [mh 'home care services, hospital-based']

#10 [mh 'home nursing']

#11 (early supported discharge OR ESD): ti/ab/kw

#12 ((early OR earlier OR prompt OR accelerate* OR acute OR subacute OR supported) NEAR/5 discharg*): ti/ab/kw

#13 (reduce* NEAR/5 (duration OR length) NEAR/5 (stay OR hospital)): ti/ab/kw

#14 (reduce* NEAR/5 (hospital OR inpatient OR in-patient) NEAR/5 (stay OR care)): ti/ab/kw

#15 'short-term ward': ti/ab/kw

#16 ((organi?ed OR multidisciplinary) NEAR/5 discharge NEAR/5 team*): ti/ab/kw

#17 ((early OR earlier OR prompt OR accelerate* OR supported) NEAR/5 return* NEAR/2 home*): ti/ab/kw

#18 (hospital* NEAR/3 home*): ti/ab/kw

#19 'hospital rehabilitation unit*': ti/ab/kw

#20 (rehabilitation near/3 home*): ti/ab/kw

#21 (intensive NEAR/2 home NEAR/5 (rehabilitation OR support*)): ti/ab/kw

#22 (mobile NEAR/2 team*): ti/ab/kw

#23 ((post-discharge OR home rehabilitation) NEAR/5 (support* OR care)): ti/ab/kw

#24 ((early OR earlier OR acute OR subacute OR post-discharge) NEAR/5 (community OR domiciliary OR primary care OR home OR home-based) NEAR/5 (rehabilitation OR support* OR care)): ti/ab/kw

#25 (OR #6-#24)

#26 (#5 AND #25)

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Appendix 2: Sample MEDLINE Search Strategy

1. exp aged

2. Aging

3. (Late life OR elder* OR aged OR old age OR geriatric OR seniors) ti/ab

4. ((old OR older OR aging OR aged OR senior OR elder*) N3 (person OR persons OR people OR adult* OR subject* OR patient* OR consumer* OR male OR males OR female* OR men OR women)) ti/ab

5. (1. OR 2. OR 3. OR 4.)

6. 'Patient Discharge' ti/ab

7. 'Progressive Patient Care' ti/ab

8. home care services OR home care services, hospital-based OR home nursing ti/ab

9. (early supported discharge OR ESD) ti/ab

10. ((early OR earlier OR prompt OR accelerate* OR acute OR subacute OR supported) N5 discharg*) ti/ab

11. (reduce* N5 (duration OR length) N5 (stay OR hospital)) ti/ab

12. (reduce* N5 (hospital OR inpatient OR in-patient) N5 (stay OR care)) ti/ab

13. 'short-term ward' ti/ab

14. ((organi?ed OR multidisciplinary) N5 discharge N5 team*) ti/ab

15. ((early OR earlier OR prompt OR accelerate$ OR supported) N5 return* N2 home*) ti/ab

16. (hospital* N3 home*) ti/ab

17. 'hospital rehabilitation unit*' ti/ab

18. (rehabilitation N3 home*) ti/ab

19. (intensive N2 home N5 (rehabilitation OR support*)) ti/ab

20. (mobile N2 team*) ti/ab

21. 'organi?ed home care' ti/ab

22. ((post-discharge OR home rehabilitation) N5 (support* OR care)) ti/ab

23. ((early OR earlier OR acute OR subacute OR post-discharge) N5 (community OR domiciliary OR primary care OR home OR home-based) N5 (rehabilitation OR support* OR care)) ti/ab

24. OR/6-23

25. 5 AND 24

26. randomi?ed controlled trials ti/ab

27. random allocation ti/ab

28. controlled clinical trials ti/ab

29. control groups ti/ab

30. clinical trials ti/ab

31. double-blind ti/ab

32. single-blind ti/ab

33. research design ti/ab

34. program evaluation ti/ab

35. randomi?ed controlled trial pt.

36. controlled clinical trial pt.

37. clinical trial pt.

38. random* ti/ab

39. (controlled N5 (trial* OR stud*)) ti/ab

40. (clinical* N5 trial*) ti/ab

41. ((control OR treatment OR experiment* OR intervention) N5 (group* OR subject* OR patient*)) ti/ab

42. (quasi-random* OR quasi random* OR pseudo-random* OR pseudo random*) ti/ab

43. ((control OR experiment* OR conservative) N5 (treatment OR therapy OR procedure OR manage*)) ti/ab

44. ((singl* OR doubl* OR tripl* OR trebl*) N5 (blind* OR mask*)) ti/ab

45. (assign* OR allocate*) ti/ab

46. controls ti/ab

47. trial ti/ab

48. OR/26-47

49. 25 AND 48

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Appendix 3: Sample CINAHL Search Strategy

S1 (MH "Aged+")

S2 (MH "Aging+")

S3 TX (Late life OR elder* OR aged OR old age OR geriatric OR seniors)

S4 TX ((old OR older OR aging OR aged OR senior OR elder*) N3 (person OR persons OR people OR adult* OR subject* OR patient* OR consumer* OR male OR males OR female* OR men OR women))

S5 S1 OR S2 OR S3 OR S4

S6 (MH "Home Health Care") OR (MH "Home Rehabilitation+") OR (MH "Home Nursing")

S7 (TI ((early OR earlier OR prompt OR accelerate* OR acute OR subacute OR supported)) AND TI discharge*) OR (AB ((early OR earlier OR prompt OR accelerate* OR acute OR subacute OR supported)) AND AB discharge*)

S8 (TI reduce* AND TI ((duration OR length)) AND TI ((stay OR hospital))) OR (AB reduce* AND AB ((duration OR length)) AND AB ((stay OR hospital)))

S9 (TI reduc* AND TI ((hospital OR inpatient OR in-patient)) AND TI ((stay OR care))) OR (AB reduc* AND AB ((hospital OR inpatient OR inpatient)) AND AB ((stay OR care)))

S10 TI short-term ward OR AB short-term ward

S11 TI ((organi?ed OR multidisciplinary)) AND TI discharge AND TI team*

S12 (TI ((organi?ed OR multidisciplinary)) AND TI discharge AND TI team*) OR (AB ((organi?ed OR multidisciplinary)) AND AB discharge AND AB team*)

S13 (TI ((early OR earlier OR prompt OR accelerate* OR supported)) AND TI return* AND TI home*) OR (AB ((early OR earlier OR prompt OR accelerate* OR supported)) AND AB return* AND AB home*)

S14 TI ((hospital* AND home*)) OR AB ((hospital* AND home*))

S15 TI hospital rehabilitation unit* OR AB hospital rehabilitation unit*

S16 TI ((rehabilitation AND home*)) OR AB ((rehabilitation AND home*))

S17 (TI intensive AND TI home AND TI ((rehabilitation OR support*)))OR (AB intensive AND AB home AND AB ((rehabilitation or support*)))

S18 TI ((mobile AND team*)) OR AB ((mobile AND team*))

S19 TI organi?ed home care OR AB organi?ed home care

S20 (TI ((post-discharge OR home rehabilitation)) AND TI ((support* OR care))) OR (AB ((post-discharge OR home rehabilitation)) AND AB ((support* OR care)))

S21 (TI ((early OR earlier OR acute OR subacute OR post-discharge)) AND TI ((community OR domiciliary OR primary care OR home OR homebased)) AND TI ((rehabilitation OR support* OR care))) OR (AB ((early OR earlier OR acute OR subacute OR post-discharge)) AND AB ((community OR domiciliary OR primary care OR home OR home-based)) AND AB ((rehabilitation OR support* OR care)))

S22 S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21

S23 (MH "Randomized Controlled Trials") OR (MH "Random Assignment") OR (MH "Random Sample+")

S24 (MH "Clinical Trials") OR (MH "Intervention Trials") OR (MH "Therapeutic Trials")

S25 (MH "Double-Blind Studies") OR (MH "Single-Blind Studies") OR (MH "Triple-Blind Studies")

S26 (MH "Control (Research)") OR (MH "Control Group") OR (MH "Placebos") OR (MH "Placebo Effect")

S27 (MH "Crossover Design") OR (MH "Quasi-Experimental Studies")

S28 PT (clinical trial OR randomized controlled trial)

S29 TI (random* OR RCT OR RCTs) OR AB (random* OR RCT OR RCTs)

S30 TI (controlled N5 (trial* OR stud*)) OR AB (controlled N5 (trial* OR stud*))

S31 TI (clinical* N5 trial*) OR AB (clinical* N5 trial*)

S32 TI ((control OR treatment OR experiment* OR intervention) N5 (group* OR subject* OR patient*)) OR AB ((control OR treatment OR experiment* OR intervention) N5 (group* OR subject* OR patient*))

S33 ((control OR experiment* OR conservative) N5 (treatment OR therapy OR procedure OR manage*)) OR AB ((control OR experiment* OR conservative) N5 (treatment OR therapy OR procedure OR manage*))

S34 TI ((singl* OR doubl* OR tripl* OR trebl*) N5 (blind* OR mask*)) OR AB ((singl* OR doubl* OR tripl* OR trebl*) N5 (blind* OR mask*))

S35 TI (cross-over OR cross over OR crossover) or AB (cross-over OR cross over OR crossover)

S36 TI (placebo* OR sham) or AB (placebo* OR sham)

S37 TI trial

S38 TI (assign* OR allocat*) OR AB (assign* OR allocat*)

S39 TI controls OR AB controls

S40 TI (quasi-random* OR quasi random* OR pseudo-random* OR pseudo random*) OR AB (quasi-random* OR quasi random* OR pseudorandom* OR pseudo random*)

S41 S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40

S42 S5 AND S22 AND S41

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Appendix 4: Sample EMBASE Search Strategy

1. aged

2. exp aging

3. (Late life OR elder* OR aged OR old age OR geriatric OR seniors) ti/ab/kw

4. ((old OR older OR aging OR aged OR senior OR elder*) NEAR/3 (person OR persons OR people OR adult* OR subject* OR patient* OR consumer* OR male OR males OR female* OR men OR women)) ti/ab/kw

5. OR/1-4

6. 'hospital discharge' ti/ab/kw

7. 'early supported discharge' ti/ab/kw

8. 'progressive patient care' ti/ab/kw

9. 'home care' OR 'home physiotherapy' OR 'home rehabilitation' ti/ab/kw

10. 'home environment' ti/ab/kw

11. 'community based rehabilitation' ti/ab/kw

12. (early supported discharge OR ESD) ti/ab/kw

13. ((early OR earlier OR prompt OR accelerate$ OR acute OR subacute OR supported) NEAR/5 discharg$) ti/ab/kw

14. (reduce$ NEAR/5 (duration OR length) NEAR/5 (stay OR hospital)) ti/ab/kw

15. (reduce$ NEAR/5 (hospital OR inpatient OR in-patient) NEAR/5 (stay OR care)) ti/ab/kw

16. short-term ward ti/ab/kw

17. ((organi?ed OR multidisciplinary) NEAR/5 discharge NEAR/5 team$) ti/ab/kw

18. ((early OR earlier OR prompt OR accelerate$ OR supported) NEAR/5 return$ NEAR/2 home$) ti/ab/kw

19. (hospital$ NEAR/3 home$) ti/ab/kw

20. hospital rehabilitation unit$ ti/ab/kw

21. (rehabilitation NEAR/3 home$) ti/ab/kw

22. (intensive NEAR/2 home NEAR/5 (rehabilitation OR support$)) ti/ab/kw

23. (mobile NEAR/2 team$) ti/ab/kw

24. organi?ed home care ti/ab/kw

25. ((post-discharge OR home rehabilitation) NEAR/5 (support$ OR care)) ti/ab/kw

26. ((early OR earlier OR acute OR subacute OR post-discharge) NEAR/5 (community OR domiciliary OR primary care OR home OR home-based) NEAR/5 (rehabilitation OR support$ OR care)) ti/ab/kw

27. OR/6-26

28. 'Randomi?ed Controlled Trial' ti/ab/kw

29. Randomi?ation ti/ab/kw

30. 'Controlled Study' ti/ab/kw

31. 'control group' ti/ab/kw

32. 'clinical trial' OR 'phase 1 clinical trial' OR 'phase 2 clinical trial' OR 'phase 3 clinical trial' OR 'phase 4 clinical trial' OR 'controlled clinical trial' ti/ab/kw

33. 'Double Blind Procedure' ti/ab/kw

34. 'Single Blind Procedure' OR 'triple blind procedure' ti/ab/kw

35. 'Parallel Design' ti/ab/kw

36. random$ ti/ab/kw

37. (controlled NEAR/5 (trial$ OR stud$)) ti/ab/kw

38. (clinical$ NEAR/5 trial$) ti/ab/kw

39. ((control OR treatment OR experiment$ OR intervention) NEAR/5 (group$ OR subject$ OR patient$)) ti/ab/kw

40. ((control OR experiment$ OR conservative) NEAR/5 (treatment OR therapy OR procedure OR manage$)) ti/ab/kw

41. ((singl$ OR doubl$ OR tripl$ OR trebl$) NEAR/5 (blind$ OR mask$)) ti/ab/kw

42. (assign$ OR alternate OR allocat$ OR counterbalance$ OR multiple baseline) ti/ab/kw

43. controls ti/ab/kw

44. trial ti/ab/kw

45. OR/28-44

46. 5 AND 27 AND 45

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Reporting checklist for protocol of a systematic review.

Based on the PRISMA-P guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the PRISMA-Preporting guidelines, and cite them as:

Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart LA. Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015 statement. Syst Rev. 2015;4(1):1.

		Reporting Item	Page Number
Title			
Identification	#1a	Identify the report as a protocol of a systematic review	1
Update	#1b	If the protocol is for an update of a previous systematic review, identify as such	N/A - this is the first review of this

			intervention in this population group
Registration			
	#2	If registered, provide the name of the registry (such as PROSPERO) and registration number	2
Authors			
Contact	#3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	1
Contribution	#3b	Describe contributions of protocol authors and identify the guarantor of the review	10
Amendments			
	#4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	N/A
Support			
Sources	#5a	Indicate sources of financial or other support for the review	10
Sponsor	#5b	Provide name for the review funder and / or sponsor	N/A - no funding was given
Role of sponsor	#5c	Describe roles of funder(s), sponsor(s), and / or	N/A - no funding was

or funder		institution(s), if any, in developing the protocol	given
Introduction			
Rationale	#6	Describe the rationale for the review in the context of what is already known	4-5
Objectives	#7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	5
Methods			
Eligibility criteria	#8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	6-7
Information sources	#9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	6
Search strategy	#10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	Appendices 1-4
Study records - data management	#11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	7-8

Study records - selection process	#11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	7-8
Study records - data collection process	#11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	7-8
Data items	#12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	8
Outcomes and prioritization	#13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	7
Risk of bias in individual studies	#14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	8
Data synthesis	#15a	Describe criteria under which study data will be quantitatively synthesised	8
Data synthesis	#15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of	8

		handling data and methods of combining data from studies, including any planned exploration of consistency (such as I2, Kendall's τ)	
Data synthesis	#15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	8
Data synthesis	#15d	If quantitative synthesis is not appropriate, describe the type of summary planned	N/A
Meta-bias(es)	#16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	8-9
Confidence in cumulative evidence	#17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	8-9

Notes:

- 1b: N/A - this is the first review of this intervention in this population group
- 5b: N/A - no funding was given
- 5c: N/A - no funding was given
- 10: Appendices 1-4 The PRISMA-P checklist is distributed under the terms of the Creative Commons Attribution License CC-BY 4.0. This checklist was completed on 24. January 2021 using https://www.goodreports.org/, a tool made by the EQUATOR Network in collaboration with Penelope.ai