2021

Statistical Analysis Plan (SAP)

HIP fracture REhabilitation Programme for older adults (HIP-REP)

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Abbreviations

ADL	Activity of daily living
AMPS	Assessment of Motor and Process Skills
MCID	Minimum Clinically Important Difference
QoL	Quality of Life
SAP	Statistical Analysis Plan

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1. Introduction

The overall aim of this study is to evaluate the efficacy of a Rehabilitation Programme for older adults with hip fracture, focusing on enabling older adults with hip fracture to safely and independently perform Activity of Daily Living (ADL), and thereby enhance their health-related Quality of Life (QoL).
This statistical analysis plan (SAP) gives a more detailed descriptions of the endpoints in the study and the statistical analysis.

2. Objectives and hypothesis

Objective: To evaluate the effect of a HIP-REP on the quality and independence in ADL ability (performance), measured with the Assessment of Motor and Process Skills (AMPS) and health-related QoL measures.
Hypothesis: The HIP-REP will increase the quality and independence in ADL performance, measured with AMPS and health-related QoL measures.

3. Study design and methods

This study is inspired by the Medical Research Councils (MRC) guidelines for Developing and Evaluating Complex Interventions and compromises the third stage of the MRC framework for assessing complex interventions (1). The study is a single-blinded randomized controlled trial, where the effect of HIP-REP, will be evaluated. The study was be registered in Clinical trial.gov (http://clinical trial.gov/) and approved by the Regional Ethical Committee and Datatilsynet.

Recruitment: The study subjects admitted from the Orthopaedic Ward, Herlev and Gentofte Hospital from 1. February 2020 to 31. December 2020 will be eligible if residence in Herlev, Rudersdal, Furesoe, LyngbyTaarbaek and Gentofte municipalities (Table 1).

Table 1 Inclusion and exclusion criteria

Inclusion and exclusion criteria – older adults with hip fractures	
Inclusion criteria:	**Exclusion criteria**
• Aged 65 years or older	• Not expected to be discharged to home or rehabilitation centres in the municipality
• Recent proximal hip fracture (S 72.0 Medial femur fracture, S 72.1, Pertrochantor femur fracture, S 72.2 Subtrochantur femur fracture)	• Not able to speak and/or understand Danish
• Living at home prior to hip fracture in Herlev, Rudersdal, Furesoe, Lyngby-Taarbaek or Gentofte municipalities	• Have prior severe physical and /or mental disabilities
• Ability to give informed consent	

Randomisation: After the initial test (baseline) older adults with hip fracture will equally be divided into the intervention- or control group (1:1) by a computer-generated block randomization in permuted blocks of 4, 6 or 8, and stratified for municipality.

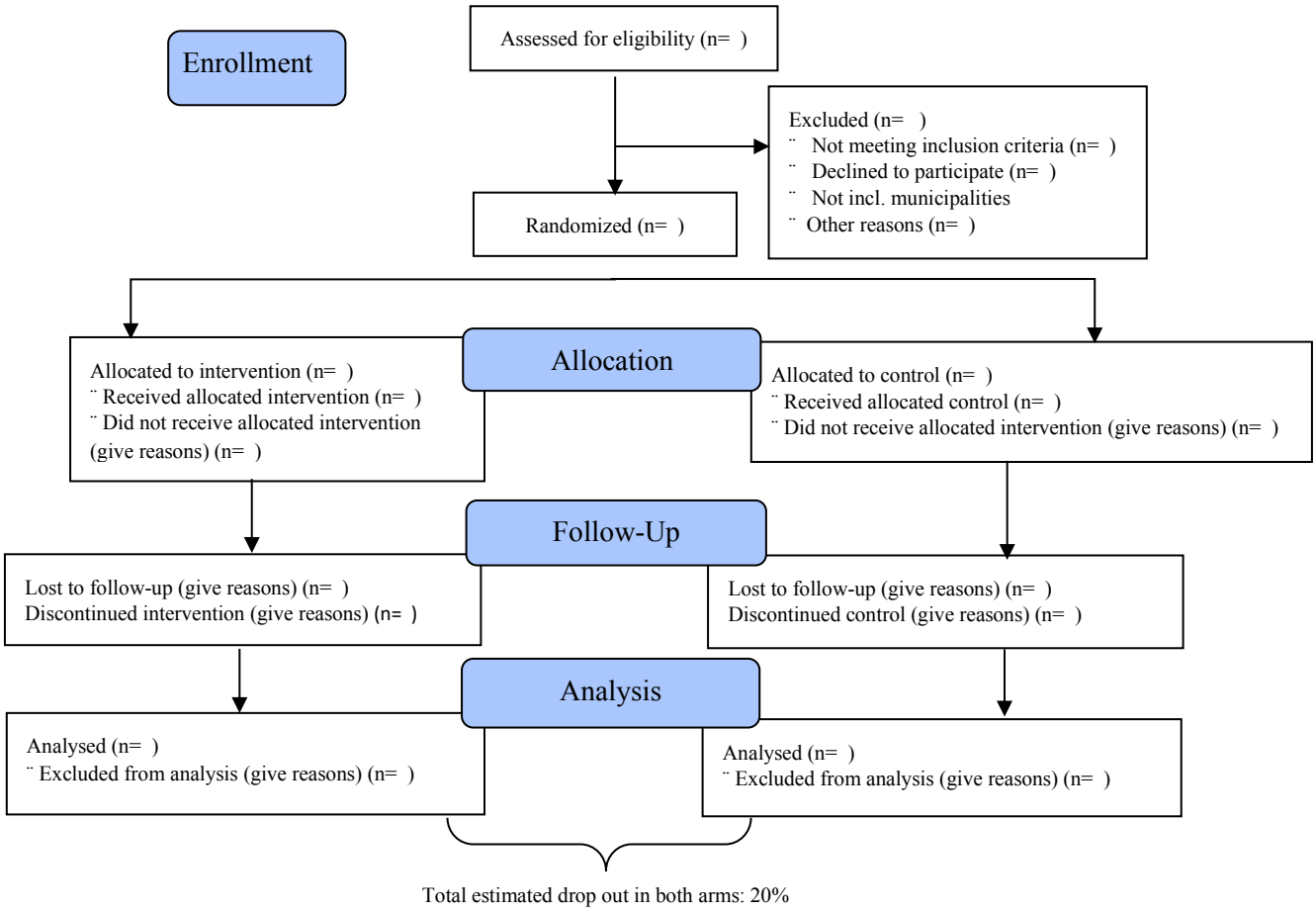
Blinding: Those testing the participants at follow-up will be blinded to previous test results and allocation. A person not involved in the rehabilitation or data collection will enter the data, and analysis will be performed blinded for group allocation.

Withdrawal/follow-up: Following the Regional Ethical Committee regulations, older adults with hip fracture or their legal representatives will be informed about the possibility of withdrawing from the study. Withdrawal from the study can occur after informed consent if the older adult regret participation. Reasons for withdrawal or lost to follow-up will be reported in the manuscript and/or flow chart.

Intervention: The main aim of the HIP-REP is to increase the quality of ADL performance and self-rated QoL for the older adults with hip fractures and thereby improve their ability to live independent at the 3-month follow-up. The HIP-REP will be tailored to the need of older adults with hip fracture in a liaison with the health care professionals (HCP).

The study design is visualised in Figure 1 below.

Figure 1 Flowchart of screening and inclusion process



3.1. Sample size caluculation

Statistical power calculation is based on the minimum clinically important difference (MCID) for motor skills in AMPS, which is 0.3 logits (2) The power is set to 0.8 and the standard deviation (SD) is 0.50, which gives a sample size of 90 persons (2). Because of expected dropout, 54 elderly with hip fracture are therefore included in each group.

4. Outcomes

This section will present the outcomes investigated to answer the study aims, objectives and hypothesis. The analyses are described in section 6 Analyses.

4.1 Primary outcome

The primary outcome (AMPS) will be assessed on the third to fifth post-operative day at the hospital (2). AMPS, is a standardized observation-based evaluation tool to measure a persons observed quality of ADL task performance in terms of physical effort and/or fatigue, efficiency, safety and independence (2). Furthermore, the AMPS test will be performed, after completed rehabilitation at 3 months follow-up to identify older adults with hip fractures challenges with Personal Activity of Daily Living (PADL) and Instrumental Activity of Daily Living (IADL).

4.2 Secondary outcomes

Functional Recovery Score (FRS) (3), Health-related QoL: European Quality of Life Scale (EQ-5D) (4) and Verbal Rating Scale (5).

Other data collected: Age, gender, type of fracture, waiting time for surgery, length of stay in acute hospital, marital status, type of dwelling, comorbidity (Charlson Index), 30-days mortality, physical therapy and occupational therapy services, level of education, warranted community-based assistance, inpatient and outpatient treatment since last assessment, usage of home-based services and pain score.

4.3. Safety outcomes

Adverse events: Adverse events are reported at each intervention.

Concomitant interventions: Participation in rehabilitation besides the HIP-REP programme during the study period will be recorded.

5. Populations and subgroups to be analysed

5.1. Populations

Intention to treat (ITT): All randomised participants. This will be the primary population for the analysis.

Per Protocol (PP): All randomised participants completing the whole study period (complete cases). Analysis of the population is seen as a sensitivity analysis to investigate whether conclusions are sensitive to the assumptions that missing data were missing at random.

5.2 Subgroups

Due to Covid-19 some participants may not have received the entire intervention at home and therefore subgroup analysis restricted to participants received at least three of the planned visits in own home.

6. Statistical analysis

The primary analysis will be a mixed effect model where group (intervention and control) and municipality are fixed, and the patient is random, assuming dropout is at random. The score at the end of rehabilitation after 3 months will be analysed unadjusted and adjusted for baseline score, age, municipality, gender, fracture and type of operation.

The estimated difference in mean change from baseline to 3 months follow-up and the corresponding 95 % confidence interval (CI) will be presented. Stata (StataCorp. 2019) will be used for the statistical analysis.

6.1. Missing data

When analyses were performed based on the ITT population, multiple imputation (MI) will be performed for both primary and secondary outcomes based on the baseline variables of patient characteristics and the outcome in question.

Referencer

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