# NKR 34 - Meniscus pathology: Supervised exercise after arthroscopy

## Review information


### Authors

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Citation example: tDHaMA. NKR 34 - Meniscus pathology: Supervised exercise after arthroscopy. Cochrane Database of Systematic Reviews [Year], Issue [Issue].

## Characteristics of studies

### Characteristics of included studies

***Forster 1982***

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|---|---|
| **Methods** | **Study design:** Randomized controlled trial<br>**Study grouping:** Parallel group<br>**Open Label:**<br>**Cluster RCT:** |
| **Participants** | **Baseline Characteristics**<br>Intervention<br>● *N*: 44<br><br>Control<br>● *N*: 44<br><br>**Included criteria:** men aged from 16 to 45 years who were available for work; a clinical diagnosis of torn medial meniscus; the willingness of the patient to enter either group; and removal of the medial meniscus at operation<br>**Excluded criteria:** full-time students were excluded |
| **Interventions** | **Intervention Characteristics**<br>Intervention<br>Control |
| **Outcomes** | *Pain*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Function*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*HRQOL*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Sick leave*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>● **Unit of measure**: days<br>● **Direction**: Lower is better<br>● **Data value**: Endpoint<br><br>*Employment retention*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Symptoms*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Muscle strength*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*SAE*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Function (gait impaired)*<br>● **Outcome type**: DichotomousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up"]<br>● **Direction**: Lower is better<br>● **Data value**: Endpoint<br><br>*return to work (failed)*<br>● **Outcome type**: AdverseEvent<br>● **Measure names**: ["Baseline", "Longest follow up"]<br>● **Reporting**: Fully reported<br>● **Unit of measure**: number not returned to work by end of study<br>● **Direction**: Lower is better<br>● **Data value**: Endpoint |
| **Identification** | **Sponsorship source:** WearegratefultotheDHSSforagrantforthisstudy. TheMedicalCareResearchUnitisalsosupportedbyTrentRHA. WeareparticularlygratefultoMrsASwindellsforthephysiotherapyassessments; toMrTMcDonaldandothersforphysiotherapytreatments;toMrDKEvans,MrWJWSharrand,MrTWDSmith, |

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| | andProfessorTDuckworthforallowingtheirpatientstoenterthetrial;toMrsJGyteforcoding;andtoMrJBradley, ProfessorJKnowelden,andtheDHSSforadvice.<br>**Country:** Great Britain<br>**Setting:** Three Sheffield hospitals.<br>**Comments:**<br>**Authors name:** DP FORSTER<br>**Institution:** DepartmentofFamilyandCommunityMedicine,UniversityofNewcastleuponTyne,NewcastleuponTyneNE17RU)<br>**Email:** Ingen mail<br>**Address:** MedicalCareResearchUnit,DepartmentofCommunityMedicine,UniversityofSheffieldMedicalSchool, SheffieldS102RX |
| **Notes** | *Jonas Larsen* on 13/08/2015 07:22<br>**Baseline Characteristics**<br>Ikke beskrevet udover inklusionskriterier og 34 variable som ikke beskrives nærmere?<br><br>*Jonas Larsen* on 13/08/2015 07:25<br>**Intervention Characteristics**<br>Ikke beskrevet |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Sequence Generation | High risk | Judgement Comment: konsekutiv inrollment |
| Allocation concealment | High risk | Judgement Comment: kun folk med job - akt/pass - konsekutivt |
| Blinding of participants and personnel | Unclear risk | Judgement Comment: not possible |
| Blinding of outcome assessors - subjective outcomes | High risk | (for 'gait impaired') |
| Blinding of outcome assessors - objective outcomes | Low risk | (for sick leave) |
| Incomplete outcome data | Low risk | one patient in the control group lost to follow up |
| Selective outcome reporting | High risk | Judgement Comment: ikke alle data reported |
| Other sources of bias | High risk | Judgement Comment: Gammelt studie!Relevant outcome er antal sygedage/time to return to work. Men kvalitative og clinical outcomes er ikke de mest relevante og valide (som eksempelvis smerte, muskelstyrke, PROs m.m.). Derudover beskrives ikke hvorfor der mangler test på enkelte testpersoner. Men dette har måske ikke betydning. |

***Goodwin 2003***

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| **Methods** | **Study design:** Randomized controlled trial<br>**Study grouping:** Parallel group<br>**Open Label:**<br>**Cluster RCT:** |
| **Participants** | **Baseline Characteristics**<br>Intervention<br>● *Age*: 38<br>● *men*: 39 male/6 female<br>● *high physical acticity level*:<br>● *BMI*: 25.8<br>● *No knee cartilage changes*:<br>● *knee pain, at least monthly*:<br>● *Awareness of knee problem, at least monthly*:<br><br>Control<br>● *Age*: 38<br>● *men*: 39 male/6 female<br>● *high physical acticity level*:<br>● *BMI*: 25.8<br>● *No knee cartilage changes*:<br>● *knee pain, at least monthly*:<br>● *Awareness of knee problem, at least monthly*:<br><br>**Included criteria:** between 18 and 60 years of age and underwent an uncomplicated arthroscopic partial meniscectomy<br>**Excluded criteria:** any concurrent injuries to their contralateral lower extremity that required medical attention, if they had any neurological disorders affecting their lower extremities, or if they were expect- ing surgery within 6 months following their arthroscopy |
| **Interventions** | **Intervention Characteristics**<br>Intervention<br>● *type of training*: Standardized written home exercise program and advice sheet while they were in the hospital. The 6 week interven-tion consisted of 3 sequential treatment periods: The first treatment period aimed at decreasing pain and swelling (using ice, ultrasound therapy, and deep friction massage) and increasing joint ROM (using joint mobilization). The second treatment period aimed at increasing muscle force and joint position sense (calf raises, step-ups, specific hip abductor, adductor, and extensor exercises, knee flexor and extensor exercises, bicycle ergometry and minitrampette and wobbleboard work). The third treatment period focused on more advanced exercises such as lateral and Z hops.<br>● *dose*: physical therapy sessions 3 times per week for the 6-week training period of the study. Sessions occurred in the outpatient physical therapy departments at 1 of 2 NHS hospitals (Mile End Hospital or Whipps Cross Hospital) or in a private hospital (Holly House Hospital) in the East London area. |

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| | Control<br>● *type of training*: All subjects received a standardized written home exer- cise program and advice sheet while they were in the hospital. The sheet format was an amalgamation of advice provided by the hospitals involved in the study and agreed on by the principal investigator (MCM) and the clinicians involved. The advice and exercises were explained by a physical therapist prior to each subject's discharge home. The sheet included information about the surgery and the recovery period and basic home exercises for the knee. Subjects were instructed to man- age their pain and swelling with rest, elevation of the limb, and application of crushed ice or a packet of frozen vegetables to the knee for 15 minutes, 4 times per day. Ten repetitions of the exercises were done hourly for the first 3 days. Then static and inner-range (0°-45° of knee flexion) quadriceps femoris muscle strengthening exercises, straight leg raises, hip flexion movements in a supine position, and knee flexion and circular hip movements in a long-sitting position were done 4 times per day until the subject's orthopedic review at 6 weeks postoperatively. Subjects in the control group received no other care during the intervention period.<br>● *dose*: 4 times per day until the subject's orthopedic review at 6 weeks postoperatively. Subjects in the control group received no other care during the intervention period. |
| **Outcomes** | *Pain*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*Function*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*HRQOL*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*Sick leave*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*Employment retention*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*Symptoms*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*Muscle strength (Quadriceps)*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*SAE*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"] |
| **Identification** | **Sponsorship source:** Grant from National Health Service Executive, London Regional Office, Responsive Funding Programme<br>**Country:** London, UK<br>**Setting:** Hospital/health care trust/University/College<br>**Comments:**<br>**Authors name:** PC Goodwin, MC Morrisey, RZ Omar, M Brown, K Southall, TB McAuliffe<br>**Institution:** Centre for Applied Biomedical Research, GKT School of Biomedical Sciences, King's College London, London, United Kingdom.<br>**Email:** matt.morrissey@kcl.ac.uk<br>**Address:** Shepherds House, Guy's Campus, London SE1 1UL, UK |
| **Notes** | *Birgitte Holm Petersen* on 15/08/2015 20:09<br>**Baseline Characteristics**<br>Også data i artiklen om:job-pause FØR surgeryhvilke(n) menisk skadet<br><br>*Birgitte Holm Petersen* on 15/08/2015 20:19<br>**Continuous Outcomes**<br>Sygefravær er en brøk (FORS) - vanskelig at omsætte<br><br>*Jonas Larsen* on 18/08/2015 06:13<br>**Pretreatment**<br>The groups were very similar for all characteristics. The number of days absent from work prior to surgery contained an outlying value of 1,600 days in the intervention group, but no difference was found between the intervention and control groups, either with or with out this value.<br><br>*Jonas Larsen* on 18/08/2015 06:34<br>**Baseline Characteristics**<br>Supplerende characteristics udover angivet nedenfor (middelværdier): Control group Intervention groupHeight (cm) 174 (157 to 192) 176 (157 to 192)Mass (kg) 84 (54 to 123) 80 (57 to 110)Sex 35 male, 6 female 39 male, 6 femaleNo. of days absent from 2 (1 to 7) 64 (0 to 1,600)work prior to surgeryDuration of injury (years) 2.4 (0.5 to 25.7 y) 1.7 (0.5 to 14.2 y)Period from surgery to pretest measurement (days) 6 (2 to 10) 5 (2 to 9)Passive knee flexion (difference injured and uninjured knees) (°) 39 (5 to 93) 44 (0 to 110) Suprapatellar knee girth (difference injured and uninjured knees) (cm) 1.3 (-1.0 to 4.0) 1.4 (-1.5 to 3.5)Injured side Left13, right28 Left22, right23Meniscus involved Medial 30 Medial 34 Lateral 9 Lateral 10 Medial and lateral 1 Medial and lateral 1 Not reported<br><br>*Jonas Larsen* on 18/08/2015 15:03<br>**Continuous Outcomes**<br>Control group Intervention group Baseline 6 wk. postsurgery Baseline 6 wk. postsurgeryHughston Clinic questionnaire score Mean 59.1 (SD 17.3) Mean 24.8 (SD 16.7) Mean 85.5 (SD 14.8) Mean 27.7 (SD 18.4)SF36 Mean 0.69 (SD 0.10) |

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| | Mean 0.76 (SD 0.10) Mean 0.68 (SD 0.12) Mean 0.75 (SD 0.12)EQ-5D Mean 0.54 (SD 0.20) Mean 0.81 (SD 0.12) Mean 0.56 (SD 0.22) Mean 0.75 (SD 0.21)Maximum-minimum kneeangle during stair ascent stance phase (degrees) Mean 40 (SD 8) Mean 51 (SD 5) Mean 42 (SD 6) Mean 49 (SD 6)Injured/unijured limb vertical jump ratio Not tested Mean 0.82 (SD 0.18) Not tested Mean 0.88 (SD 0.19)No of days taken to return to work after surgery/FORS score Not tested Mean 1.4 (SD 1.5) Not tested Mean 1.5 (SD 1.8) |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Sequence Generation | High risk | No information/12 kirurger henviser til projektet - |
| Allocation concealment | Unclear risk | blok randomisering, men ikke beskrevet om det var brev/pc/andet |
| Blinding of participants and personnel | Unclear risk | ikk muligt |
| Blinding of outcome assessors - subjective outcomes | Unclear risk | ikke muligt |
| Blinding of outcome assessors - objective outcomes | Unclear risk | ikke muligt |
| Incomplete outcome data | Low risk | |
| Selective outcome reporting | Low risk | |
| Other sources of bias | Low risk | |

***Jokl 1989***

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| **Methods** | **Study design:** Randomized controlled trial<br>**Study grouping:** Parallel group<br>**Open Label:**<br>**Cluster RCT:** |
| **Participants** | **Baseline Characteristics**<br>Intervention<br>● *Age*: Mean 30.7 (SD 13.9)<br>● *men*: 12<br>● *high physical acticity level*:<br>● *BMI*:<br>● *No knee cartilage changes*:<br>● *Duration of symptoms (week)*: 21.3<br>● *Awareness of knee problem, at least monthly*:<br><br>Control<br>● *Age*: Mean 30.7 (SD 13.9)<br>● *men*: 12<br>● *high physical acticity level*:<br>● *BMI*:<br>● *No knee cartilage changes*:<br>● *Duration of symptoms (week)*: 21.3<br>● *Awareness of knee problem, at least monthly*:<br><br>**Included criteria:** no history of previous knee surgery on either extremity, the willingness to be random- ized into either of the study groups postoperatively, absence of significant other knee joint pathology (i.e., severe degenerative joint disease), and ab- sence of severe medical conditions<br>**Excluded criteria:** Intet yderligere udover inclusions criteria |
| **Interventions** | **Intervention Characteristics**<br>Intervention<br>● *type of training*: Whirlpool, ROM exercises, electric stimulation to quadriceps, quadriceps setting and straight leg raising and hip extensions.<br>● *dose*: 3 times a week with 45 min. spent at each rehab. session. Additional weights were added when tolerated.<br><br>Control<br>● *type of training*: Home exercise program: Quadriceps setting, straight leg raise, ROM, abduction/adduction, hamstring curls.<br>● *dose*: 3 set, 10 reps. each day. All exercises adding weight approximately 1 lb/day or as tolerated. They were encouraged to start low impact sports when 25 lbs was realized on quadriceps extensions. Full athletic once 45 lb could be accomplished. |
| **Outcomes** | *Pain*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Function*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*HRQOL*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Sick leave*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Employment retention*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Symptoms*<br>● **Outcome type**: ContinuousOutcome |

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| | ● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*Muscle strength (Quadriceps)*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*SAE*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"] |
| **Identification** | **Sponsorship source:** none<br>**Country:** USA<br>**Setting:** Hospital and Home<br>**Comments:** kun 8 ugers opfølgning<br>**Authors name:** P. Jokl, P. Stull, J. Lynch & V. Vaughan<br>**Institution:** Dep. of Orthopaedics and Rehab., Yale University School of medicine<br>**Email:** no<br>**Address:** Dr. Peter Jokl, Professor of Orthopaedics and Rehabilitation, Yale Univer- sity School of Medicine, 240 Sargent Drive, New Haven, CT 06511, U.S.A. |
| **Notes** | *Jonas Larsen* on 14/08/2015 06:55<br>**Baseline Characteristics**<br>Karakteristika udover nedenstående tabel: Group 1 Group 2Knee involved: 9 right, 6 left 8 right, 7 left Meniscus affected: 13 medial/2 lateral 11 medial/4 lateral Duration ofsymptoms: Mean 21.3 weeks Mean 37.4 weeks SD 37.5 SD 49.6 Range 3-150 weeks Range I-200 weeks Tear type: Bucket handle 5 Bucket handle 4 Flap 9 Flap 11 Horizontal cleavage 1 Horizontal cleavage 1Surgeon: P.J. 7 P.J. 10 K.L. 8 K.L. 5<br><br>*Jonas Larsen* on 14/08/2015 07:28<br>**Continuous Outcomes**<br>De relevante outcomes som ikke kunne komme i nedenstående tabel er indsat her:Summary og qualitative assessments of knee function: Week 2 Week 4 Week 8 Group 1 Group 2 Group 1 Group 2 Group 1 Group 2 (n) (n) (n) (n) (n) (n) Knee gives away: 3 5 1 4 1 1Difficulty stairs: 9 10 5 3 2 1Difficulty crouching: 9 12 6 9 2 5Limping: 4 3 1 2 0 0Return normal activities: 7 9 10 12 13 13 Return sports: 0 0 1 4 8 9Patients subjective evaluation of knee pain: Severe Moderate Mild None Group 1 Group 2 Group 1 Group 2 Group 1 Group 2 Group 1 Group 2 Week 2 1 0 4 2 4 10 4 2Week 4 0 0 1 1 5 9 8 5 Week 8 0 0 0 1 3 4 11 10Patients overall assessment of knee function at final evaluation: Excellent Good Fair PoorGorup 1 9 4 0 0Group 2 9 4 1 0<br><br>*Birgitte Holm Petersen* on 15/08/2015 21:01<br>**Pretreatment**<br>All patients from private praxis<br><br>*Birgitte Holm Petersen* on 15/08/2015 21:01<br>**Continuous Outcomes**<br>ingen VAS-score eller lignendeTABLE 2 GIVER IKKE MULIGHED FOR AT UDTRÆKKE DATA |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Sequence Generation | High risk | Quote: "Thirty patients derived from the private practices of two orthopaedic surgeons were entered blindly into the study after an arthroscopically confirmed diagnosis of a meniscal tear treated by arthroscopic partial meniscectomy. Criteria" |
| Allocation concealment | High risk | Judgement Comment: TILFÆLDIGT HENV FRA PRIV PRAX |
| Blinding of participants and personnel | Unclear risk | |
| Blinding of outcome assessors - subjective outcomes | Unclear risk | |
| Blinding of outcome assessors - objective outcomes | Unclear risk | |
| Incomplete outcome data | Low risk | |
| Selective outcome reporting | High risk | Judgement Comment: MANGLER BASISDATA |
| Other sources of bias | High risk | Judgement Comment: Lille population |

***Osteras 2014***

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|---|---|
| **Methods** | **Study design:** Randomized controlled trial<br>**Study grouping:** Parallel group<br>**Open Label:**<br>**Cluster RCT:** |
| **Participants** | **Baseline Characteristics**<br>Intervention<br>● *Weight, kg*: 80.4 (9.3)<br>● *Height, cm*: 177.3 (8.2)<br>● *Duration of symptoms, years*: 1.9 (2.6)<br>● *Age, years (SD)*: 43.6 (8.2)<br>● *Male (%)*: 14 (54)<br>● *Arthritis, grade 1 (%) (Spector and Cooper, 1993)*: 5 (50)<br>● *Arthritis, grade 2 (%)*: 2 (25) |

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| | control<br>● *Weight, kg*: 79.4 (9.4)<br>● *Height, cm*: 175.7 (5.9)<br>● *Duration of symptoms, years*: 2.2 (1.8)<br>● *Age, years (SD)*: 46.8 (9.5)<br>● *Male (%)*: 12 (46)<br>● *Arthritis, grade 1 (%) (Spector and Cooper, 1993)*: 5 (50)<br>● *Arthritis, grade 2 (%)*: 6 (75)<br><br>**Included criteria:** Subjects with knee pain for more thantwo months, who were 35e60 years of age and eligible forarthroscopic partial meniscectomy, with an MRIefrom theradiologist's descriptioneshowing a degenerative meniscustear.<br>**Excluded criteria:** ACL rupture and thoserequiring acute trauma surgeries, including high energytraumas with ligament injuries, osteoarthritis grade 3e4(Spector and Cooper, 1993), hemarthroses and acute cases oflocking knee, comorbidities excluding physical activities andexercise, and drug abuse |
| **Interventions** | **Intervention Characteristics**<br>Intervention<br>● *No rehabilitation program*: no exsercise<br>● *An exercise program had been developed and tested in a prior RCT (Østera˚s et al., 2012b), and was further developed for this particular study, with a focus on high repetitions of pain free exercises, knee function and strength training.*: An exercise program had been developed and tested in aprior RCT (Østera˚set al., 2012b), and was further devel-oped for this particular study, with a focus on high repeti-tions of pain free exercises, knee function and strengthtraining. Improved muscle strength and function couldpotentially have a positive influence on knee symptoms,function and the progression of osteoarthritis. The programallowed for individual differences due to performance andprogression. Based on clinical experience the interventionperiod was three months, and the subjects performed theexercise program three times per week.<br><br>control<br>● *No rehabilitation program*: +<br>● *An exercise program had been developed and tested in a prior RCT (Østera˚s et al., 2012b), and was further developed for this particular study, with a focus on high repetitions of pain free exercises, knee function and strength training.*: |
| **Outcomes** | *Pain*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>● **Scale**: 0-10<br><br>*Function (activity and participation)*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*HRQOL*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Sick leave*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Employment retention*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Symptoms*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Muscle strength, 5 RM*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*SAE*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Muscle strength, quadriceps peak torque*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Hospital Anxiety and Depression Scale (HADS)*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>● **Reporting**: Fully reported<br><br>*One-leg jump test*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>● **Notes**: One-leg jump test is symmetry index; operated leg/unoperated leg*100. |
| **Identification** | **Sponsorship source:** No<br>**Country:** Norway<br>**Setting:** Hospital<br>**Comments:** KOOS and other measures was also evaluated. But the subscale scores of KOOS was not given, which is why this was not included in the extraction.<br>**Authors name:** Østerås H<br>**Institution:** Faculty of Health Educationand Social Work, Department of Physical Therapy<br>**Email:** havard.osteras@hist.no<br>**Address:** Ranheimsv. 10, N-7004 Trondheim, Norway |

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| **Notes** | *Birgitte Holm Petersen* on 21/07/2015 21:17<br>**Continuous Outcomes**<br>Funcion = one-leg-jumpHAD=HRQOLlongest followUP=12 mdr |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Sequence Generation | Unclear risk | The same investi- gator, who was not involved in the randomization procedure, prepared all the envelopes in the study. |
| Allocation concealment | Low risk | A computer-generated randomization schedule was used, with annotations for treatment according to exercise therapy or no postoperative rehabilitation. |
| Blinding of participants and personnel | High risk | Neither participants nor personnel could be blinded |
| Blinding of outcome assessors - subjective outcomes | High risk | Outcome assessor not blinded |
| Blinding of outcome assessors - objective outcomes | Low risk | Measures less likely to be affected by lack of blinding |
| Incomplete outcome data | Low risk | få bortfald No other information that that above and information reasons for attrition in Figure 6 (relatively balanced between groups). It seems like as-treated analysis was applied, which are increasing the risk of bias, but since little information was provided in the paper on missing data unclear was chosen by one rew, however, stated LOW alltogether |
| Selective outcome reporting | Unclear risk | No information provided, and no registration number of the study protocol are given or can be located. |
| Other sources of bias | Low risk | |

***Osteras 2014a***

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|---|---|
| **Methods** | **Study design:** Randomized controlled trial<br>**Study grouping:** Parallel group<br>**Open Label:**<br>**Cluster RCT:** |
| **Participants** | **Baseline Characteristics**<br>Intervention<br>● *Age (SD), years)*: 46.3 (8.3)<br>● *Weight, kg*: 79.6 (9.8)<br>● *Height, cm*: 177.2 (7.6)<br>● *Duration of symptoms, years*: 2.1 (2.3)<br>● *Gender (% female)*: 12 (33)<br>● *Osteoarthritis, grade 1 (%)*: 9 (25)<br>● *Osteoarthritis, grade 2 (%)*: 3 (8)<br><br>control<br>● *Age (SD), years)*: 46.3 (8.9)<br>● *Weight, kg*: 80.1 (9.8)<br>● *Height, cm*: 176.3 (6.2)<br>● *Duration of symptoms, years*: 2.1 (1.6)<br>● *Gender (% female)*: 11 (32)<br>● *Osteoarthritis, grade 1 (%)*: 6 (18)<br>● *Osteoarthritis, grade 2 (%)*: 7 (21)<br><br>**Included criteria:** subjects with knee pain for more than two–three months, being between the ages 35 and 60 years and eligible for arthroscopic partial meniscectomy and having an MRI showing a degenerative meniscus tear<br>**Excluded criteria:** An ACL rupture, those requiring acute trauma surgeries, those having high-energy traumas with ligament injuries, an osteoarthritis grade of 3–4, hemarthroses and acute cases of locking knee. In addition, the following were also included in the exclusion criteria: symptomatic pain in contrary extremity- and other musculoskeletal comorbidities severely affecting lower extremity muscle function overriding the symptoms from the knee, comorbidities that exclude physical activities and exercise, not being able to speak or read the language of interest, drug abuse or mental problems. |
| **Interventions** | **Intervention Characteristics**<br>Intervention<br>● *No exercise program*:<br>● *An exercise programme had been developed and tested in a prior trial [28] and was further developed for this particular study, with a focus on coordination, muscle function and strength training.*: An exercise programme had been developed and testedin a prior trial [28] and was further developed for thisparticular study, with a focus on coordination, musclefunction and strength training. The programme was alsoindividually tailored with respect to rehabilitation perfor-mance and progression, and based on clinical experience;the intervention period was 3 months, with the subjectsperforming the exercise programme three times per week<br><br>control<br>● *No exercise program*: +<br>● *An exercise programme had been developed and tested in a prior trial [28] and was further developed for this particular study, with a focus on coordination, muscle function and strength training.*: No exercise program |
| **Outcomes** | *Pain*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br><br>*Function (activity and participation)*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"] |

| | |
|---|---|
| | *HRQOL*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*Sick leave*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*Employment retention*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*Symptoms*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*Muscle strength, 5RM*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*SAE*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*Hospital Anxiety and Depression Scale (HADS)*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>*One-leg hop test*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up", "2 weeks after intervention (SAEs only)"]<br>● **Notes**: Oneleg hop test score was calculated (uninjured side score/injured side score) 9 100 |
| **Identification** | **Sponsorship source:** ikke angivet<br>**Country:** Norway<br>**Setting:** Hospital<br>**Comments:** KOOS and other measures was also evaluated. But the subscale scores of KOOS was not given, which is why this was not included in the extraction.<br>**Authors name:** Østerås, H<br>**Institution:** Sør-Trøndelag University College, Faculty of Health Education and Social Work, Department of Physical Therapy<br>**Email:** havard.osteras@hist.no<br>**Address:** Ranheimsv 10, N-7004 Trondheim, NORWAY |
| **Notes** | *Birgitte Holm Petersen* on 22/07/2015 02:24<br>**Continuous Outcomes**<br>Pain=VASFunktion=one-leg hopHRQL=HAD |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Sequence Generation | Low risk | computer-generated randomization schedule was used, with annotations for treatment according to medical exer- cise therapy or no postoperative rehabilitation. |
| Allocation concealment | Unclear risk | Allocation concealment not described sufficiently. |
| Blinding of participants and personnel | High risk | Blinding of participants and personnel not possible. Annotation unrelated to blinding. |
| Blinding of outcome assessors - subjective outcomes | High risk | Outcome assessor not blinded |
| Blinding of outcome assessors - objective outcomes | Low risk | Measures less likely to be affected by lack of blinding 3 forskellige fys træner |
| Incomplete outcome data | Low risk | meget få dropouts 7-8% As-treated analysis was applied instead of ITT-analysis, because the drop-out rate was low, which is not a valid argument. However, attrition rates and reasons were given in Fig 1 and seems relatively balanced between groups. |
| Selective outcome reporting | Unclear risk | No registration number for the trial was given or found, nor a link to the study protocol. |
| Other sources of bias | Low risk | |

***Seymour 1969***

| | |
|---|---|
| **Methods** | **Study design:** Randomized controlled trial<br>**Study grouping:** Parallel group<br>**Open Label:**<br>**Cluster RCT:** |
| **Participants** | **Baseline Characteristics**<br>Intervention<br>● *Age*:<br>● *men*:<br>● *high physical acticity level*:<br>● *BMI*:<br>● *No knee cartilage changes*:<br>● *knee pain, at least monthly*:<br>● *Awareness of knee problem, at least monthly*: |

| | |
|---|---|
| | Control<br>● *Age*:<br>● *men*:<br>● *high physical acticity level*:<br>● *BMI*:<br>● *No knee cartilage changes*:<br>● *knee pain, at least monthly*:<br>● *Awareness of knee problem, at least monthly*:<br><br>**Included criteria:** Only those patients who were found at operation to have a tear of the medial meniscus and who had a routine medial meniscectomy<br>**Excluded criteria:** Those having a normal medial meniscus or any other joint pathology other than a torn medial meniscus apart from minimal laxity of the anterior cruciate ligament. |
| **Interventions** | **Intervention Characteristics**<br>Intervention<br>● *type of training*: Quadriceps exercises, walking training, increasingly vigorous exercises: Running, jumping, climbing and skipping<br>● *dose*: 3 times a week for a total of 6 week after discharge<br><br>Control<br>● *type of training*: No treatment or instructions other than those during bed rest at the hospital: Walking allowed.<br>● *dose*: None |
| **Outcomes** | *Pain*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up"]<br><br>*Function*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up"]<br><br>*HRQOL*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up"]<br><br>*Sick leave*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up"]<br><br>*Employment retention*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up"]<br><br>*Symptoms*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up"]<br><br>*Muscle strength (Quadriceps)*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up"]<br><br>*SAE*<br>● **Outcome type**: ContinuousOutcome<br>● **Measure names**: ["Baseline", "Longest follow up"] |
| **Identification** | **Sponsorship source:** Ikke angivet<br>**Country:** England<br>**Setting:** Infirmary<br>**Comments:**<br>**Authors name:** N. Seymour<br>**Institution:** The Royal Infirmary, Sheffield<br>**Email:** Ikke aktuelt<br>**Address:** Ikke angivet |
| **Notes** | *Jonas Larsen* on 13/08/2015 17:54<br>**Baseline Characteristics**<br>Ikke beskrevet<br><br>*Jonas Larsen* on 14/08/2015 08:03<br>**Continuous Outcomes**<br>Effusion: Baseline 3 months Sum af grading (0-3 pr. patient) Sum af grading (0-3 pr. patient)Group A 32 3Group B 34 17ROM: 10 days postop. 3 months postop. Average flexion Average flexionGroup A 45 67Group B 135 137 Time of return to work and full activities (ingen tal/statistik på dette):No difference between groups. Average of 4 1/2 weeks for sedentary workers and 6 1/2 weeks for manual workers.Almost all patients in both groups were undertaking nearly full activities after 3 months postop. |

Risk of bias table

| Bias | Authors' judgement | Support for judgement |
|---|---|---|
| Sequence Generation | High risk | |
| Allocation concealment | High risk | |
| Blinding of participants and personnel | Unclear risk | |

| | | |
|---|---|---|
| Blinding of outcome assessors - subjective outcomes | Unclear risk | |
| Blinding of outcome assessors - objective outcomes | Unclear risk | |
| Incomplete outcome data | High risk | Judgement Comment: Der mangler præcise data på "time of return to work". Det er dog beskrevet med ord. Ingen statistiske beregninger på resultater i tabel 1-4. |
| Selective outcome reporting | High risk | |
| Other sources of bias | High risk | Judgement Comment: Gammelt studie med postoperativt regime som ikke er aktuelt i dag. Nogle outcomes er irrelevante eller upålidelige. |

*Footnotes*

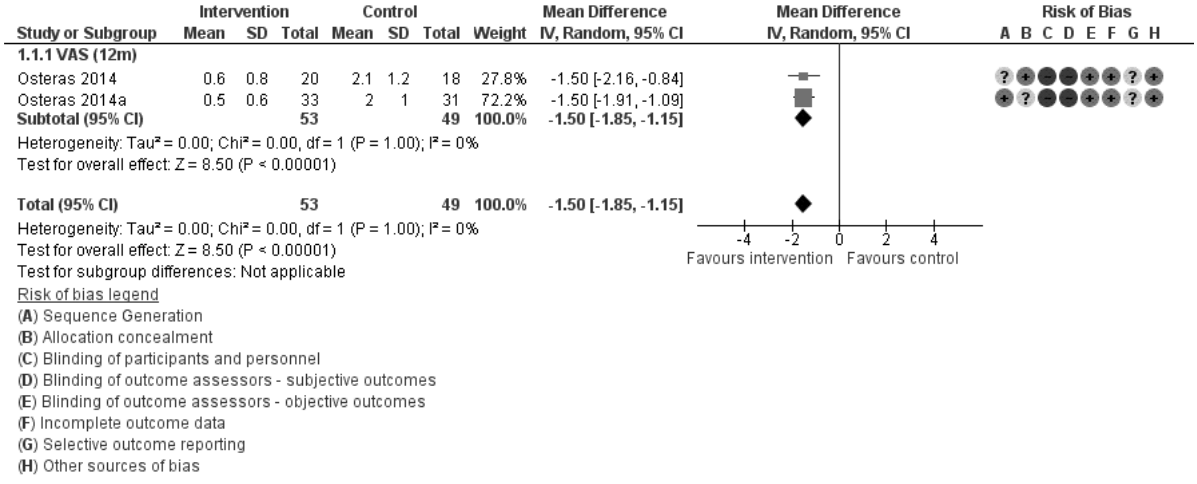
# Data and analyses

### 1 Supervised exercise vs instruction

| Outcome or Subgroup | Studies | Participants | Statistical Method | Effect Estimate |
|---|---|---|---|---|
| 1.1 Pain | 2 | 102 | Mean Difference (IV, Random, 95% CI) | -1.50 [-1.85, -1.15] |
| 1.1.1 VAS (12m) | 2 | 102 | Mean Difference (IV, Random, 95% CI) | -1.50 [-1.85, -1.15] |
| 1.2 Function | 3 | 179 | Mean Difference (IV, Random, 95% CI) | -13.02 [-17.44, -8.61] |
| 1.2.2 One-leg-jump ratio(%), higher=better (6w to 12m) | 3 | 179 | Mean Difference (IV, Random, 95% CI) | -13.02 [-17.44, -8.61] |
| 1.3 HRQOL | 1 | 83 | Mean Difference (IV, Random, 95% CI) | -0.01 [-0.06, 0.04] |
| 1.3.1 SF-36 (6w) | 1 | 83 | Mean Difference (IV, Random, 95% CI) | -0.01 [-0.06, 0.04] |
| 1.4 HAD | 2 | 102 | Mean Difference (IV, Random, 95% CI) | -1.91 [-3.09, -0.74] |
| 1.4.2 HAD (12m) | 2 | 102 | Mean Difference (IV, Random, 95% CI) | -1.91 [-3.09, -0.74] |
| 1.5 Sick leave | 1 | 79 | Mean Difference (IV, Random, 95% CI) | 0.10 [-0.63, 0.83] |
| 1.5.1 Days to return to work (6-26w) | 1 | 79 | Mean Difference (IV, Random, 95% CI) | 0.10 [-0.63, 0.83] |
| 1.6 Employment retention | 1 | 86 | Risk Ratio (M-H, Fixed, 95% CI) | 1.27 [0.30, 5.35] |
| 1.6.1 failed to return to work (26w) | 1 | 86 | Risk Ratio (M-H, Fixed, 95% CI) | 1.27 [0.30, 5.35] |
| 1.7 Symptoms | 1 | 84 | Mean Difference (IV, Random, 95% CI) | 2.90 [-4.61, 10.41] |
| 1.7.1 Hughston Clinic questionnaire, lower=better (6w) | 1 | 84 | Mean Difference (IV, Random, 95% CI) | 2.90 [-4.61, 10.41] |
| 1.8 Muscle strength | 2 | 102 | Mean Difference (IV, Random, 95% CI) | -8.13 [-9.84, -6.41] |
| 1.8.2 5rm (12m) | 2 | 102 | Mean Difference (IV, Random, 95% CI) | -8.13 [-9.84, -6.41] |
| 1.9 SAE | 0 | 0 | Mean Difference (IV, Fixed, 95% CI) | Not estimable |
| 1.10 Function | 1 | 84 | Risk Ratio (IV, Random, 95% CI) | 0.19 [0.01, 3.86] |
| 1.10.1 gait impaired (26w) | 1 | 84 | Risk Ratio (IV, Random, 95% CI) | 0.19 [0.01, 3.86] |

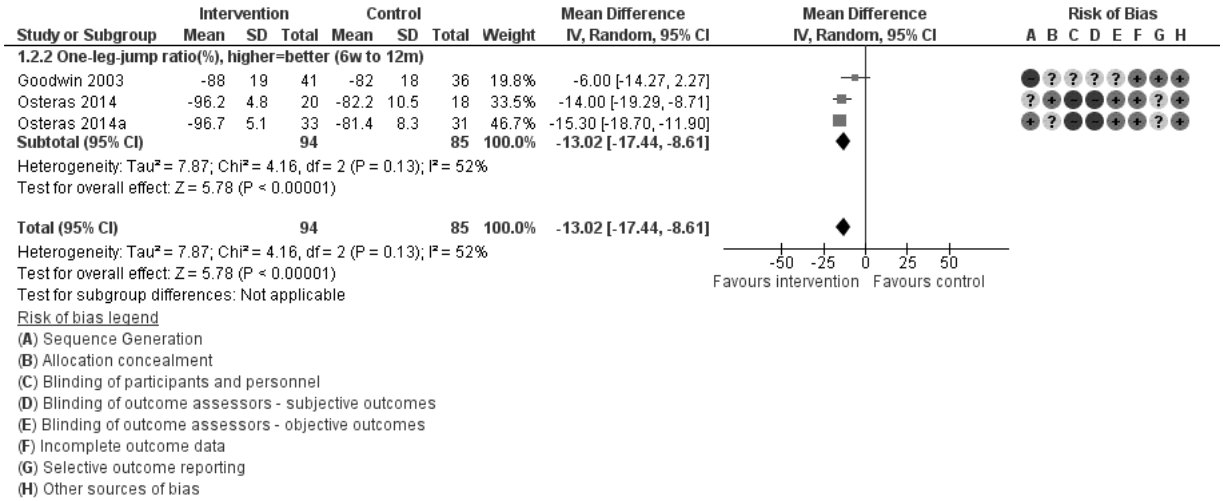
# Figures

### Figure 1 (Analysis 1.1)



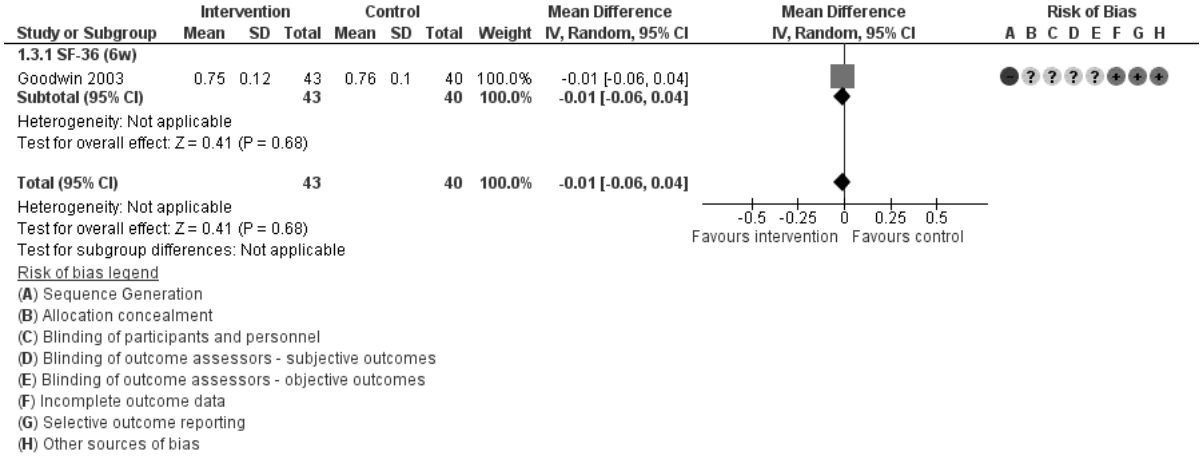

Forest plot of comparison: 1 Supervised exercise vs instruction, outcome: 1.1 Pain.

**Figure 2 (Analysis 1.2)**



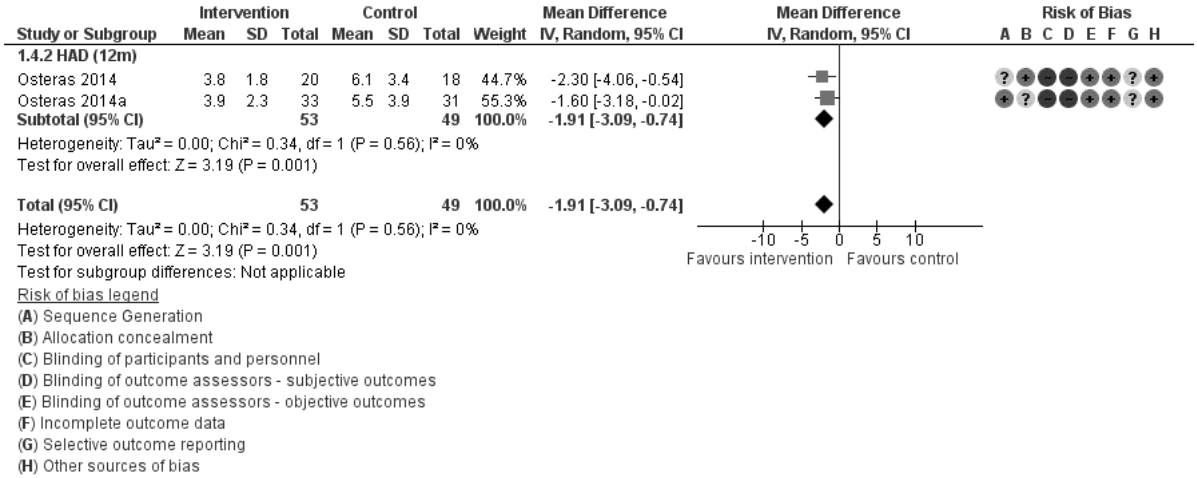

Forest plot of comparison: 1 Supervised exercise vs instruction, outcome: 1.2 Function.

**Figure 3 (Analysis 1.3)**



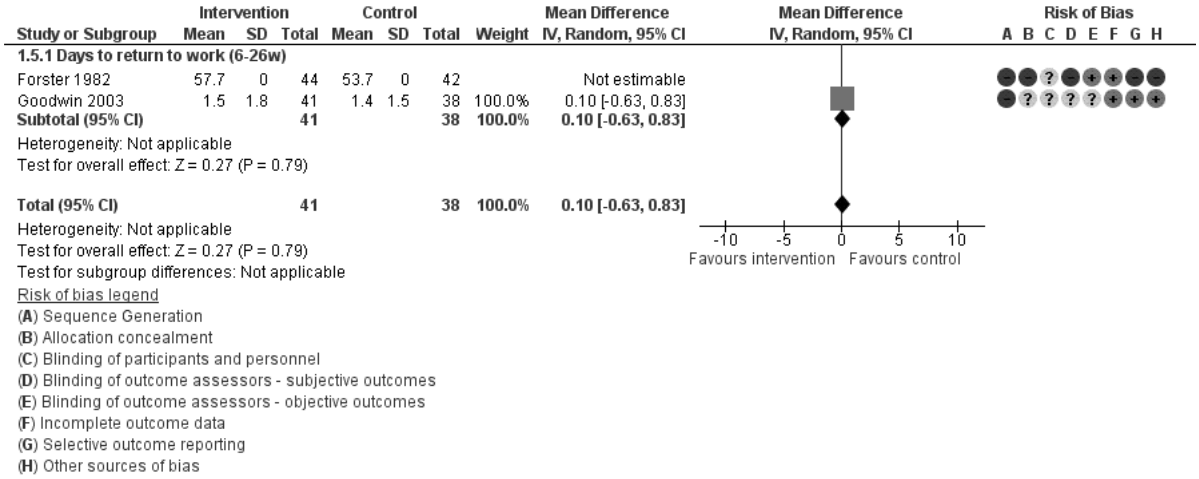

Forest plot of comparison: 1 Supervised exercise vs instruction, outcome: 1.3 HRQOL.

**Figure 4 (Analysis 1.4)**



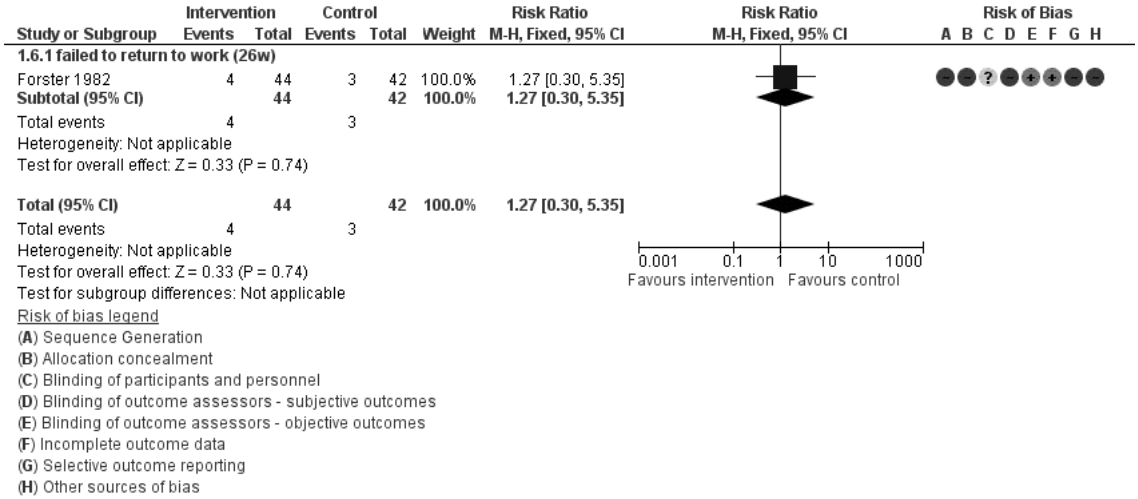

Forest plot of comparison: 1 Supervised exercise vs instruction, outcome: 1.4 HAD.

**Figure 5 (Analysis 1.5)**



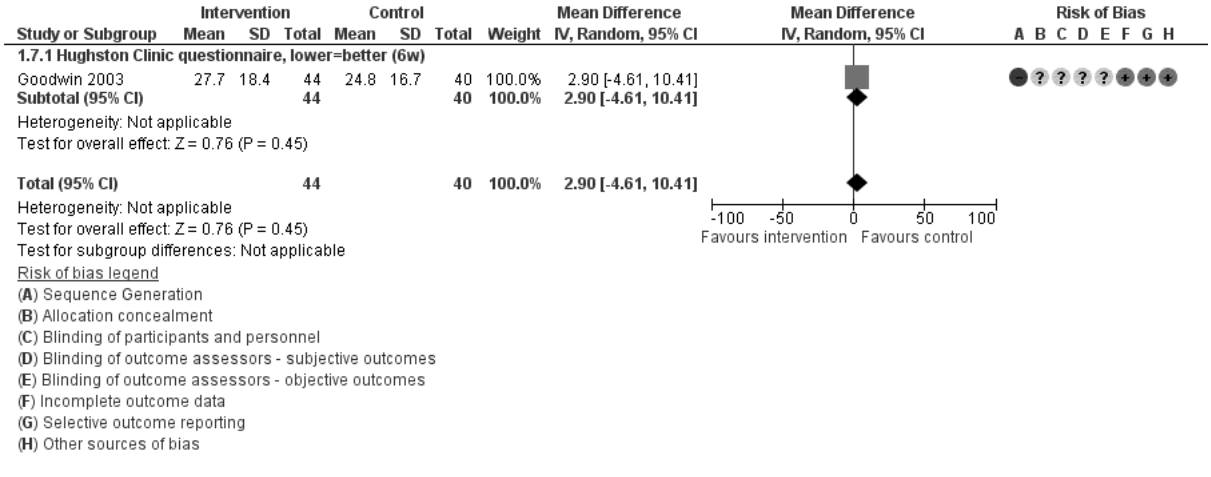

Forest plot of comparison: 1 Supervised exercise vs instruction, outcome: 1.5 Sick leave.

**Figure 6 (Analysis 1.6)**



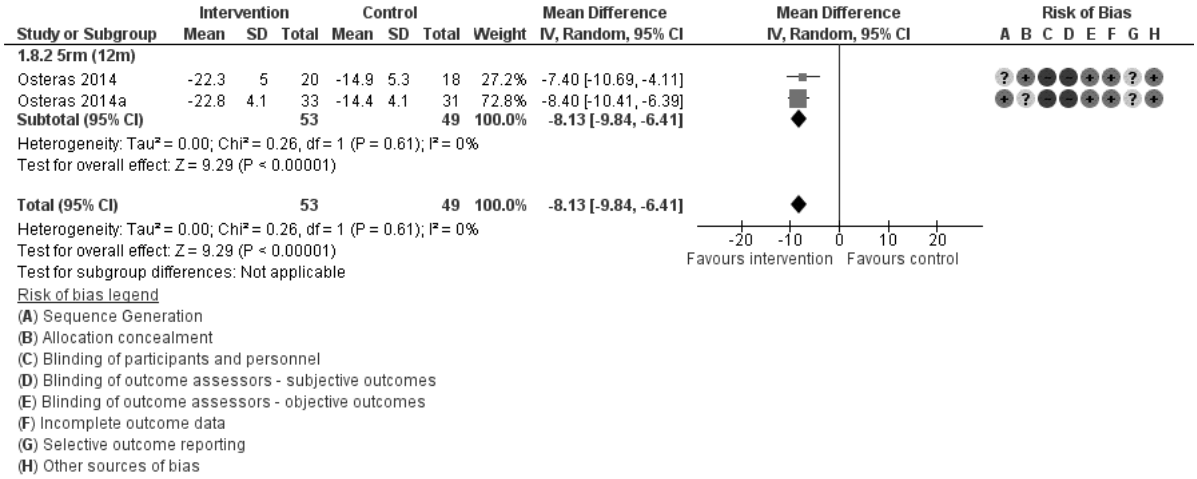

Forest plot of comparison: 1 Supervised exercise vs instruction, outcome: 1.6 Employment retention.

**Figure 7 (Analysis 1.7)**



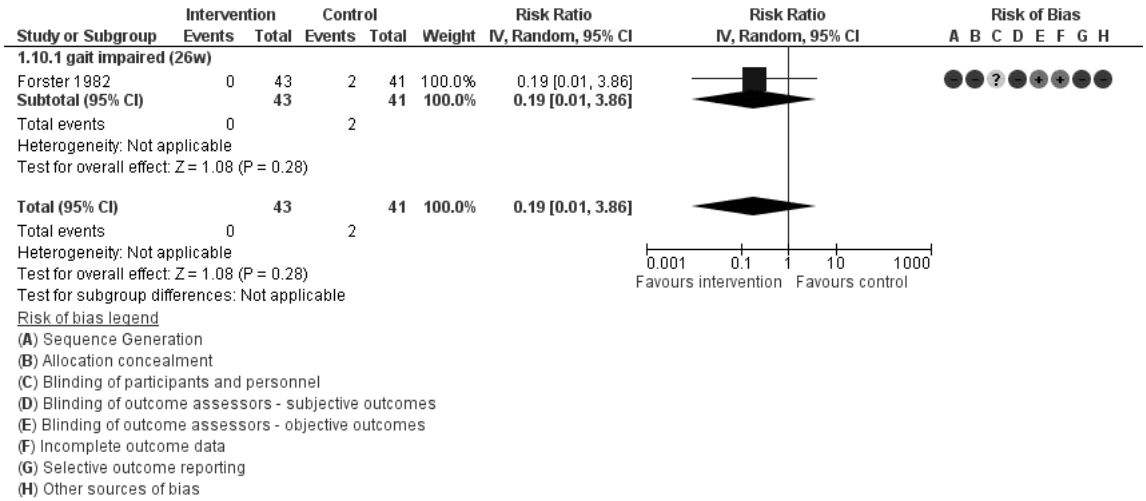

Forest plot of comparison: 1 Supervised exercise vs instruction, outcome: 1.7 Symptoms.

**Figure 8 (Analysis 1.8)**




Forest plot of comparison: 1 Supervised exercise vs instruction, outcome: 1.8 Muscle strength.

**Figure 9 (Analysis 1.10)**




Forest plot of comparison: 1 Supervised exercise vs instruction, outcome: 1.10 Function.