

## PICO 7

### Review information

#### Authors

[Empty name]<sup>1</sup>

<sup>1</sup>[Empty affiliation]

Citation example: [Empty name]. PICO 7. Cochrane Database of Systematic Reviews [Year], Issue [Issue].

### Characteristics of studies

#### Characteristics of included studies

##### Husby 2009

<b>Methods</b>	<b>Study design:</b> <b>Study grouping:</b> <b>Open Label:</b> <b>Cluster RCT:</b>
<b>Participants</b>	<b>Baseline Characteristics</b> Intervention Control <b>Included criteria:</b> Inclusion criteria were age less than 70 years, a diagnosis of primary osteoarthritis as the main cause for elective THAsurgery, and an ASA score of PI <b>Excluded criteria:</b> Exclusion criteria included mus-cular or skeletal disease that might influence the training andphysical testing performance, heart or lung diseases, and dia-betes mellitus. <b>Pretreatment:</b>
<b>Interventions</b>	<b>Intervention Characteristics</b> Intervention <ul style="list-style-type: none"> <li>● <i>Strength training:</i> Usual care + strength training. (Dose: 4 sets 5/wk for 4 weeks, intensity 85% of max)</li> </ul>

	Control
<p><b>Outcomes</b></p>	<ul style="list-style-type: none"> <li>● <i>Strength training</i>: Usual care (inpatient rehabilitation, 5 days/wk, 2 patients home-based)</li> </ul> <p><i>Patientrapporteret funksjonsevne</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type</b>: ContinuousOutcome</li> <li>● <b>Reporting</b>: Fully reported</li> <li>● <b>Scale</b>: Merle D'Aubigné and Postelscoring system</li> <li>● <b>Range</b>: 3-18</li> <li>● <b>Unit of measure</b>: Points</li> <li>● <b>Direction</b>: Higher is better</li> <li>● <b>Data value</b>: Endpoint</li> </ul> <p><i>Præstasjonsbaseret funksjonsevne</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type</b>: ContinuousOutcome</li> <li>● <b>Reporting</b>: Not reported</li> </ul> <p><i>Smerte (hofferelateret)</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type</b>: ContinuousOutcome</li> <li>● <b>Reporting</b>: Not reported</li> </ul> <p><i>Helbredsrelateret livskvalitet</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type</b>: ContinuousOutcome</li> <li>● <b>Reporting</b>: Fully reported</li> <li>● <b>Scale</b>: SF-36 Physical Component Score (PCS)</li> <li>● <b>Range</b>: 0-100</li> <li>● <b>Unit of measure</b>: Points</li> <li>● <b>Direction</b>: Higher is better</li> <li>● <b>Data value</b>: Endpoint</li> </ul> <p><i>Hoffeluksation</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type</b>: AdverseEvent</li> <li>● <b>Reporting</b>: Not reported</li> </ul> <p><i>Reoperation</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type</b>: AdverseEvent</li> <li>● <b>Reporting</b>: Not reported</li> </ul>

	<p>Hævelse</p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Not reported</li> </ul> <p><i>Træningsinducerede skader i bevægeapparatet</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Not reported</li> </ul> <p><i>Smerte (ikke hofterelateret)</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Not reported</li> </ul>
<b>Identification</b>	<p><b>Sponsorship source:</b> No commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit on the authors or on any organization with which the authors are associated</p> <p><b>Country:</b> Norge</p> <p><b>Setting:</b></p> <p><b>Comments:</b></p> <p><b>Authors name:</b> Husby, 2009</p> <p><b>Institution:</b></p> <p><b>Email:</b></p> <p><b>Address:</b></p>
<b>Notes</b>	<p><i>Nkr 41 Hoffte on 27/02/2016 07:24</i></p> <p><b>Select</b></p> <p>Only 4 week intervention, but 5 sessions a week, high intensity</p>

### Risk of bias table

<b>Bias</b>	<b>Authors' judgement</b>	<b>Support for judgement</b>
Blinding of participants and personnel	High risk	Judgement Comment: Ikke muligt at blinde participants - dog ikke nævnt i teksten

Selective outcome reporting	Low risk	Judgement Comment: Reports both data with and without effect. No sign of selective outcome reporting
Incomplete outcome data	Low risk	Judgement Comment: All participants included in analysis
Other sources of bias	Unclear risk	Judgement Comment: Ikke muligt at vurdere. Behov for at se protokol for at kunne vurdere dette.
Blinding of outcome assessors	Unclear risk	Judgement Comment: Not mentioned
Sequence Generation	Low risk	Quote: "We randomly assigned the patients manually by drawing lots. The procedure was performed by 2 persons not familiar with the different treatment options. We"
Allocation concealment	Unclear risk	Quote: "We randomly assigned the patients to either the group performing maximal strength training in addition to the conventional rehabilitation program (STG), or to the group that participated in the conventional rehabilitation program only (CRG)."

## Mikkelsen 2014

<b>Methods</b>	<p><b>Study design:</b> Randomized controlled trial</p> <p><b>Study grouping:</b> Parallel group</p> <p><b>Open Label:</b></p> <p><b>Cluster RCT:</b></p>
<b>Participants</b>	<p><b>Baseline Characteristics</b></p> <p>Intervention</p> <p>Control</p> <p><b>Included criteria:</b> Inclusion criteria were: Primary unilateral THR for hiposteoarthritis (OA), preoperative HOOS ADL67, age &gt; 18 years, residence within 30 km from the hospital and willing to participate in training twice a week for 10 weeks.</p> <p><b>Excluded criteria:</b> Exclusion criteria were: Resurfacing hip implant, body mass index (BMI) &gt; 35, pre-planned supervised rehabilitation, pre-planned contralateral THR within 6 months, inability to speak or read Danish and mental or physical conditions impeding the intervention</p> <p><b>Pretreatment:</b></p>
<b>Interventions</b>	<p><b>Intervention Characteristics</b></p> <p>Intervention</p> <ul style="list-style-type: none"> <li>● <i>Strength training:</i> Strength training (ST) + home-based exercises (Dose: ST 2/wk for 10 weeks)</li> </ul> <p>Control</p> <ul style="list-style-type: none"> <li>● <i>Strength training:</i> Home-based exercises</li> </ul>

## Outcomes

### *Patientrapporteret funktionsevne*

- **Outcome type:** ContinuousOutcome
- **Reporting:** Fully reported
- **Scale:** HOOS ADL
- **Range:** 0-100
- **Unit of measure:** Points
- **Direction:** Higher is better
- **Data value:** Endpoint

### *Præstationsbaseret funktionsevne*

- **Outcome type:** ContinuousOutcome
- **Reporting:** Fully reported
- **Scale:** Rejse/sættes sig test (30 sek)
- **Unit of measure:** Antal oprejsninger på 30 sek
- **Direction:** Higher is better
- **Data value:** Endpoint

### *Smerte (hofterelateret)*

- **Outcome type:** ContinuousOutcome
- **Reporting:** Fully reported
- **Scale:** HOOS Pain
- **Range:** 0-100
- **Unit of measure:** Points
- **Direction:** Higher is better
- **Data value:** Endpoint

### *Helbredsrelateret livskvalitet*

- **Outcome type:** ContinuousOutcome
- **Reporting:** Fully reported
- **Scale:** HOOS QOL
- **Range:** 0-100
- **Unit of measure:** Points
- **Direction:** Higher is better
- **Data value:** Endpoint

	<p><i>Hofteleksation</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Fully reported</li> <li>● <b>Data value:</b> Endpoint</li> </ul> <p><i>Reoperation</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Not reported</li> <li>● <b>Data value:</b> Endpoint</li> </ul> <p><i>Hævelse</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Not reported</li> </ul> <p><i>Træningsinducerede skader i bevægeapparatet</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Fully reported</li> <li>● <b>Data value:</b> Endpoint</li> </ul> <p><i>Smerte (ikke hofterelateret)</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Partially reported</li> <li>● <b>Data value:</b> Endpoint</li> </ul>
<p><b>Identification</b></p>	<p><b>Sponsorship source:</b> The study was supported by grants from The Health Research Fund of Central Denmark Region, The Danish Rheumatism Association (R70-A1104), The Association of Danish Physiotherapists, The Health Foundation and Aase and Ejnar Danielsen's Foundation (10-000067). The study sponsors had no role in the study design, collection, analysis and interpretation of data; nor in the writing of the manuscript or the decision to submit the manuscript for publication</p> <p><b>Country:</b> Denmark</p> <p><b>Setting:</b></p> <p><b>Comments:</b></p> <p><b>Authors name:</b> Mikkelsen, 2014</p> <p><b>Institution:</b></p> <p><b>Email:</b></p>

	<b>Address:</b>
<b>Notes</b>	<i>Nkr 41 Hoffe on 27/02/2016 08:37</i> <b>Select</b> Initiated week 1, 10 wk intervention, high intensity

### Risk of bias table

Bias	Authors' judgement	Support for judgement
Blinding of participants and personnel	High risk	
Selective outcome reporting	Low risk	Judgement Comment: None detected
Incomplete outcome data	Low risk	Judgement Comment: Small and equal drop out rate i the groups
Other sources of bias	Low risk	Judgement Comment: None detected
Blinding of outcome assessors	Low risk	Judgement Comment: Outcome assessores were blinded
Sequence Generation	Low risk	
Allocation concealment	Low risk	Quote: "equal distribution between the groups. <b>Sequence in permuted blocks with equal numbers of "intervention" and "control" assignments was obtained using a simple "shuffling envelope" procedure before study initiation by a secretary not involved in the study.</b> During admission, staff and patients"

### Suetta 2004

<b>Methods</b>	<b>Study design:</b> Randomized controlled trial <b>Study grouping:</b> Parallel group <b>Open Label:</b> <b>Cluster RCT:</b>
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<p><b>Participants</b></p>	<p><b>Baseline Characteristics</b></p> <p>Intervention</p> <p>Control</p> <p><b>Included criteria:</b> Eligibility criteria included age of 60 and older and unilateral primary hip replacement due to primary hip osteoarthritis in patients without cardiopulmonary, neurological, or cognitive problems. To avoid differences in comorbidity between groups, only patients without American Society of Anesthesiologists (ASA) score of I to II(=no comorbidity, II=comorbidity but no systemic affection) were included</p> <p><b>Excluded criteria:</b> See inclusion</p> <p><b>Pretreatment:</b></p>
<p><b>Interventions</b></p>	<p><b>Intervention Characteristics</b></p> <p>Intervention</p> <ul style="list-style-type: none"> <li>● <i>Strength training:</i> Strength training + home-based exercise (Dose: 3/wk for 12 weeks)</li> </ul> <p>Control</p> <ul style="list-style-type: none"> <li>● <i>Strength training:</i> Home-based exercises</li> </ul>
<p><b>Outcomes</b></p>	<p><i>Patientrapporteret funksjonsevne</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> ContinuousOutcome</li> <li>● <b>Reporting:</b> Not reported</li> </ul> <p><i>Præstasjonsbaseret funksjonsevne</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> ContinuousOutcome</li> <li>● <b>Reporting:</b> Fully reported</li> <li>● <b>Scale:</b> Sit-to-stand test (5 reps)</li> <li>● <b>Unit of measure:</b> Seconds</li> <li>● <b>Direction:</b> Lower is better</li> <li>● <b>Data value:</b> Endpoint</li> </ul> <p><i>Smerte (hofferelateret)</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> ContinuousOutcome</li> <li>● <b>Reporting:</b> Not reported</li> </ul> <p><i>Helbredsrelateret livskvalitet</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> ContinuousOutcome</li> <li>● <b>Reporting:</b> Not reported</li> </ul>



	<p><i>Hofte luksation</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Not reported</li> </ul> <p><i>Reoperation</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Not reported</li> </ul> <p><i>Hævelse</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Not reported</li> </ul> <p><i>Træningsinducerede skader i bevægeapparatet</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Fully reported</li> <li>● <b>Data value:</b> Endpoint</li> </ul> <p><i>Smerte (ikke hofterelateret)</i></p> <ul style="list-style-type: none"> <li>● <b>Outcome type:</b> AdverseEvent</li> <li>● <b>Reporting:</b> Not reported</li> </ul>
<b>Identification</b>	<p><b>Sponsorship source:</b> None stated</p> <p><b>Country:</b> Danmark</p> <p><b>Setting:</b></p> <p><b>Comments:</b></p> <p><b>Authors name:</b> Suetta, 2004</p> <p><b>Institution:</b></p> <p><b>Email:</b></p> <p><b>Address:</b></p>
<b>Notes</b>	

## Risk of bias table

Bias	Authors' judgement	Support for judgement
Blinding of participants and personnel	High risk	Judgement Comment: Staff was blinded, but blinding participants seems impossible
Selective outcome reporting	Low risk	
Incomplete outcome data	High risk	Judgement Comment: 25% drop out in control group and 18% in intervention group. No intention-to-treat analysis.
Other sources of bias	High risk	Judgement Comment: ud af 68 takkede 32 nej til at deltage
Blinding of outcome assessors	Unclear risk	Judgement Comment: Blinding not mentioned Blinding not mentioned
Sequence Generation	Low risk	
Allocation concealment	Unclear risk	n

## Footnotes

## References to studies

### Included studies

#### *Husby 2009*

Husby, V. S.; Helgerud, J.; Bjørgen, S.; Husby, O. S.; Benum, P.; Hoff, J.. Early Maximal Strength Training Is an Efficient Treatment for Patients Operated With Total Hip Arthroplasty. Archives of Physical Medicine and Rehabilitation 2009;90(10):1658-1667. [DOI: 10.1016/j.apmr.2009.04.018]

#### *Mikkelsen 2014*

Mikkelsen, L. R.; Mechlenburg, J.; Soballe, K.; Jørgensen, L. B.; Mikkelsen, S.; Bandholm, T.; Petersen, A. K.. Effect of early supervised progressive resistance training compared to unsupervised home-based exercise after fast-track total hip replacement applied to patients with preoperative functional limitations. A single-blinded randomised controlled trial. Osteoarthritis and cartilage / OARS, Osteoarthritis Research Society 2014;22(12):2051-8. [DOI: ]

## Suetta 2004

Suetta, C.; Magnusson, S. P.; Rosted, A.; Aagaard, P.; Jakobsen, A. K.; Larsen, L. H.; Duus, B.; Kjaer, M.. Resistance training in the early postoperative phase reduces hospitalization and leads to muscle hypertrophy in elderly hip surgery patients - A controlled, randomized study. Journal of the American Geriatrics Society 2004;52(12):2016-2022. [DOI: 10.1111/j.1532-5415.2004.52557.x]

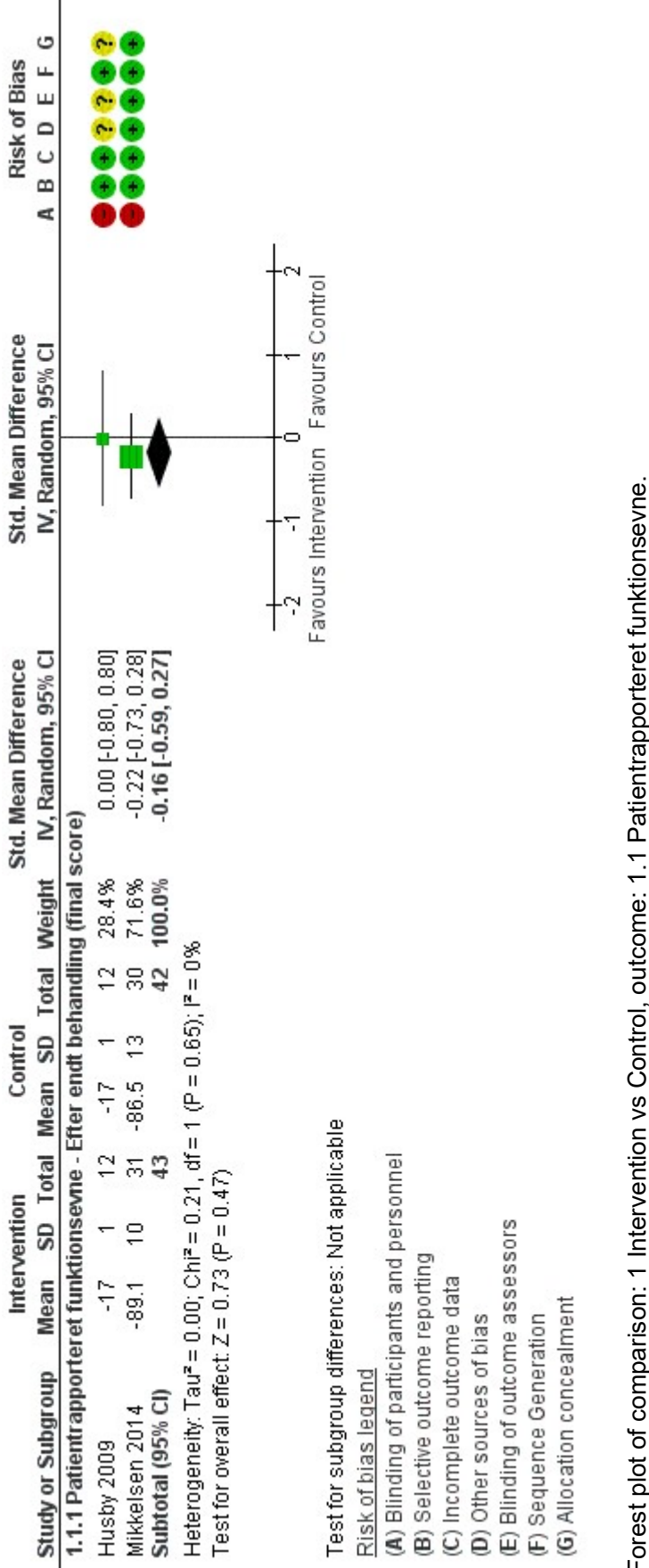
## Data and analyses

### 1 Intervention vs Control

Outcome or Subgroup	Studies	Participants	Statistical Method	Effect Estimate
1.1 Patientrapporteret funktionsevne	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.1.1 Patientrapporteret funktionsevne - Efter endt behandling (final score)	2	85	Std. Mean Difference (IV, Random, 95% CI)	-0.16 [-0.59, 0.27]
1.2 Patientrapporteret funktionsevne	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
1.2.2 Patientrapporteret funktionsevne (6-12 mdr)	1	61	Mean Difference (IV, Fixed, 95% CI)	-2.30 [-7.44, 2.84]
1.3 Præstationsbaseret funktionsevne	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.3.1 Præstationsbaseret funktionsevne EoT	2	82	Std. Mean Difference (IV, Random, 95% CI)	-0.35 [-0.79, 0.09]
1.4 Smerte (hofterelateret)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
1.4.1 Smerte (hofterelateret) - Efter endt behandling	1	60	Mean Difference (IV, Fixed, 95% CI)	2.40 [-4.79, 9.59]
1.5 Antal træningsinducerede skader	2	82	Risk Ratio (M-H, Random, 95% CI)	Not estimable
1.6 Helbredsrelateret livskvalitet	2		Mean Difference (IV, Random, 95% CI)	Subtotals only
1.6.1 Helbredsrelateret livskvalitet - Efter endt behandling	2	84	Mean Difference (IV, Random, 95% CI)	-1.60 [-6.22, 3.01]

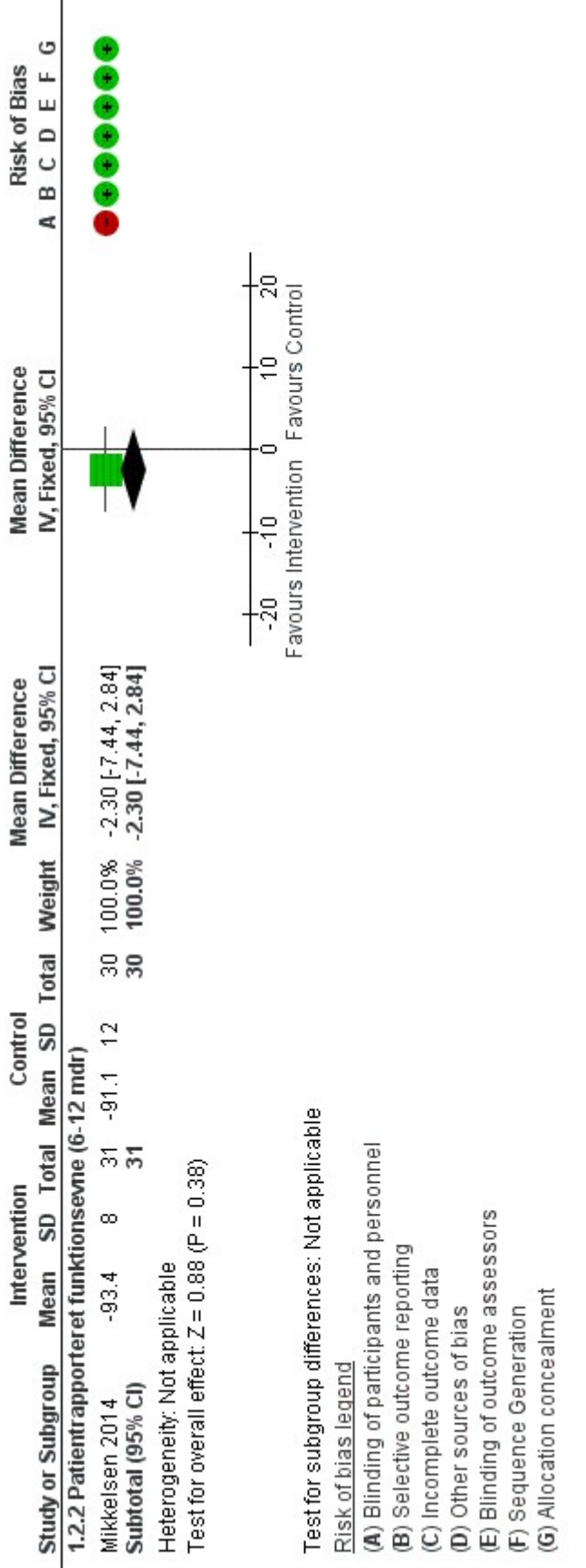
# Figures

**Figure 1 (Analysis 1.1)**



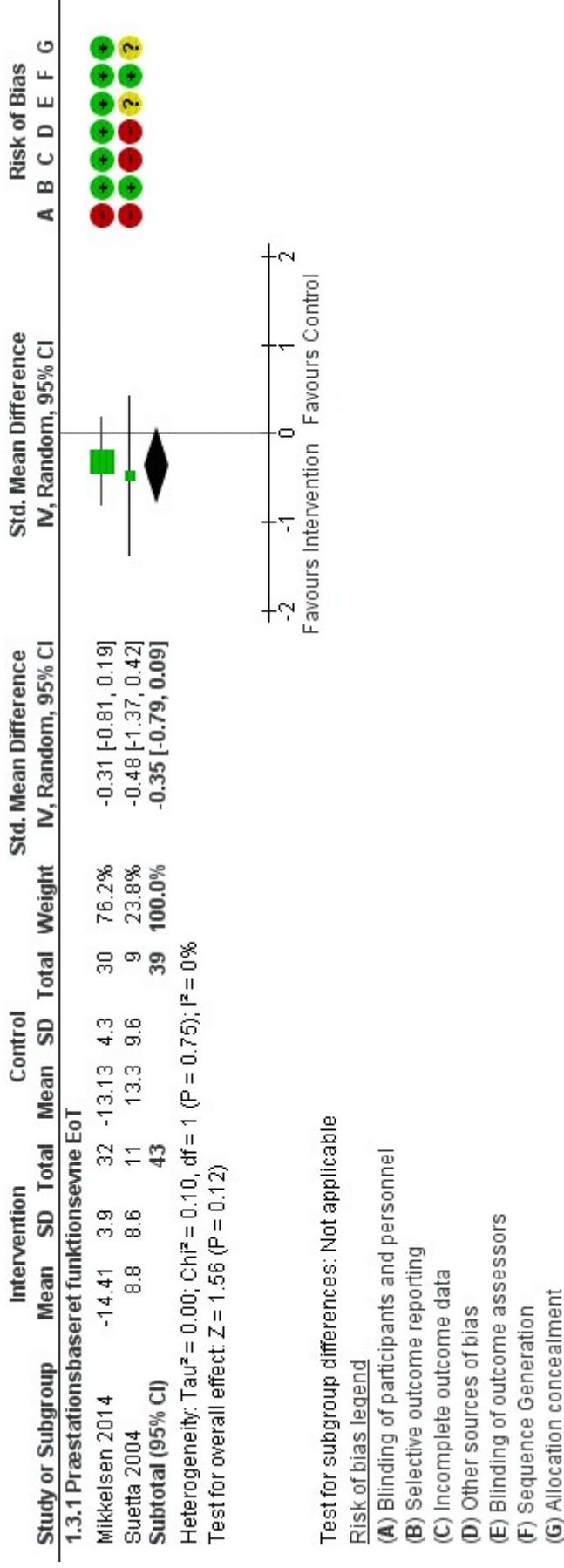
Forest plot of comparison: 1 Intervention vs Control, outcome: 1.1 Patientrapporteret funktionsevne.

**Figure 2 (Analysis 1.2)**



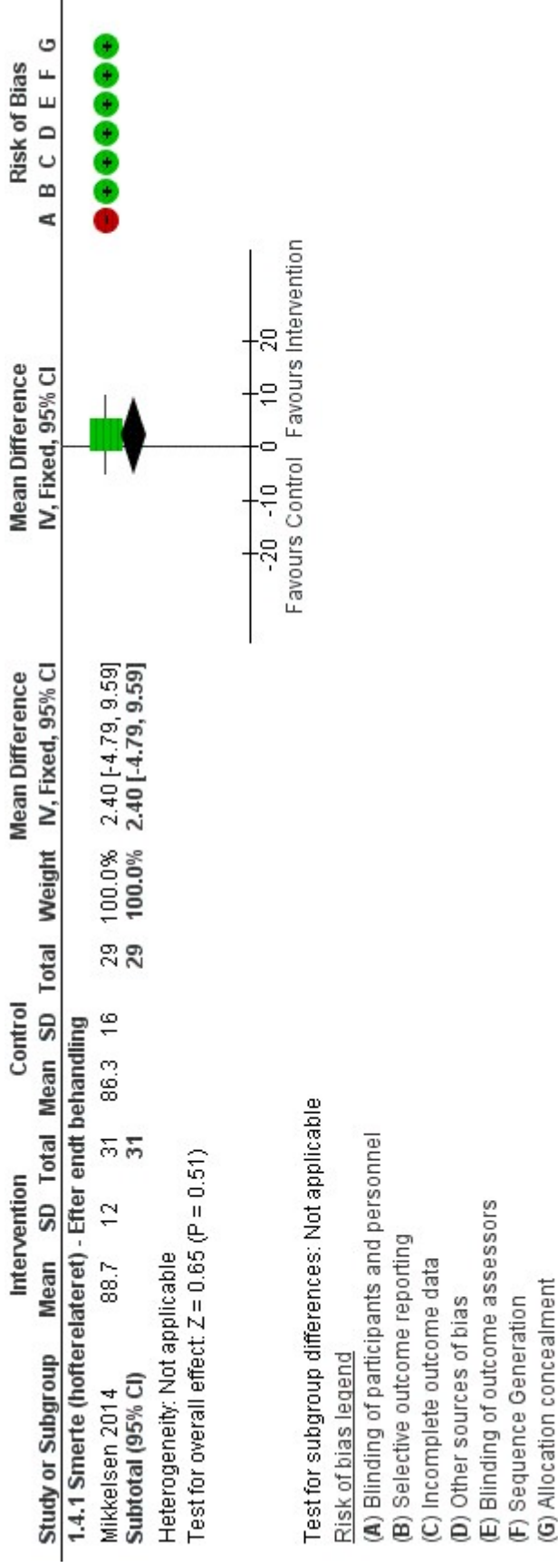
Forest plot of comparison: 1 Intervention vs Control, outcome: 1.2 Patientrapporteret funktionsevne.

**Figure 3 (Analysis 1.3)**



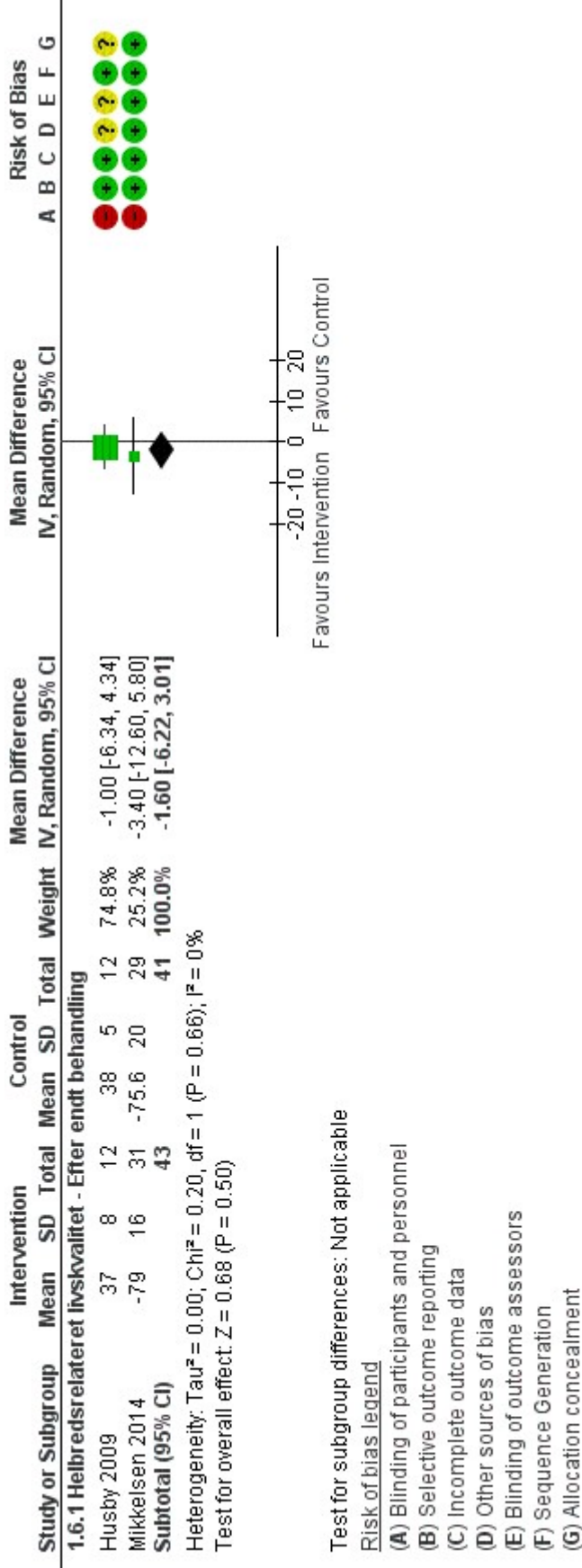
Forest plot of comparison: 1 Intervention vs Control, outcome: 1.3 Præstationsbaseret funktionsevne.

**Figure 4 (Analysis 1.4)**



Forest plot of comparison: 1 Intervention vs Control, outcome: 1.4 Smerte (hofferlateret).

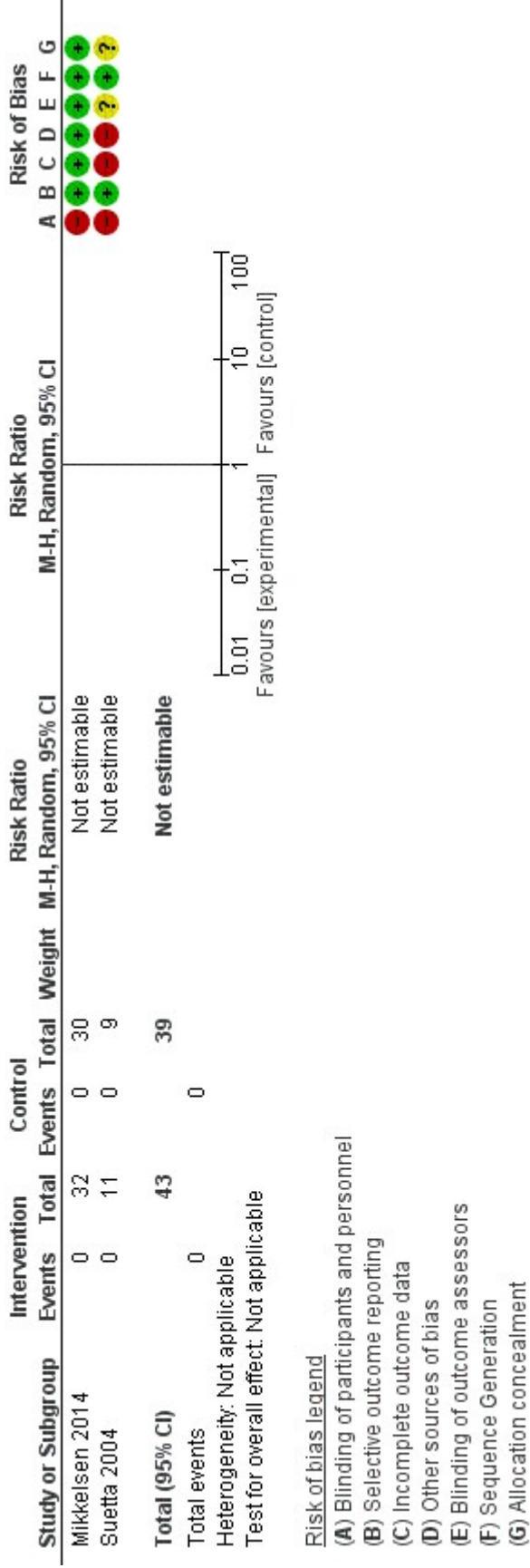
**Figure 5 (Analysis 1.6)**



Forest plot of comparison: 1 Intervention vs Control, outcome: 1.6 Helbredsrelateret livskvalitet.

Figure 6 (Analysis 1.5)





Forest plot of comparison: 1 Intervention vs Control, outcome: 1.5 Antal træningsinducerede skader.