Traction versus standard care for cervical radiculopathy

Review information

Authors

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What's new

Date / Event	Description

History

Date / Event	Description

Abstract

Background

Objectives

Search methods

Selection criteria

Data collection and analysis

Main results

Authors' conclusions

Plain language summary

[Summary title]

[Summary text]

Background

Description of the condition

Description of the intervention

How the intervention might work

Why it is important to do this review

Objectives

Methods

Criteria for considering studies for this review

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BAPM 1966

Methods	**Study design:** Randomized controlled trial **Study grouping:** Parallel group **Open Label:** **Cluster RCT:** YES
Participants	
Interventions	
Outcomes	
Identification	
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	How the random fashion was defined is not clear.
Allocation concealment (selection bias)	Unclear risk	allocation procedures not described
Blinding of participants and personnel (performance bias)	High risk	The initial assessment seems not to be blinded, whereas follow up may be is. Not possible to blind in this type of studes
Blinding of outcome assessment (detection bias)	Low risk	The observer is blinded at six weeks and six months (questionnaires)., The observed is blinded at six weeks and six months (questionnaires)
Incomplete outcome data (attrition bias)	Low risk	Drop out has been accounted for and relatively small.
Selective reporting (reporting bias)	Low risk	Usual outcomes of pain are selected and relevant outcomes overall
Other bias	Unclear risk	The study is having sound methodology, despite the randomization procedure is not described.

Fritz 2014

Methods	**Study design:** Randomized controlled trial **Study grouping:** Parallel group **Open Label:** **Cluster RCT:** YES
Participants	**Baseline Characteristics** Exercise • *Participants (number)*: 28 • *Age, in years*: 44.9 (11.3)

	• *sex n (%) female*: 18 (64.3) • *Sick leave, n (%)*: 12 (42.9) Exercise + traction • *Participants (number)*: 31 • *Age, in years*: 48.1 (10.0) • *sex n (%) female*: 13 (41.9) • *Sick leave, n (%)*: 9 (29.0) Exercise + over-door traction • *Participants (number)*: 27 • *Age, in years*: 47.6 (10.9) • *sex n (%) female*: 15 (55.6) • *Sick leave, n (%)*: 8 (29.6) **Included criteria:** Chief complaint of neck pain with symptoms (pain or numbness) extending distal to the acromioclavicular joint or caudal to the superior border of the scapula, age between 18 and 70 years, and a Neck Disability Index (NDI) score of 10 or greater (0-100 scale). **Excluded criteria:** History of surgery to the neck or thoracic spine, a recent motor vehicle accident (past 2 weeks), any red flags indicative of a serious or possible nonmusculoskeletalcondition (eg, spinal tumor, fracture, metabolic or infectious disease), a diagnosis of cervical spinal stenosisbased on magnetic resonance imaging or computed tomography imaging, or evidence of cervical myelopathy or central nervous system involvement. Patients were excluded if they knew they would be unable to comply with the treatment or follow-up schedule.
Interventions	**Intervention Characteristics** Exercise • *content*: Remain as active as possibleand to perform all exercises daily on the days between therapy sessions. Writtenexercise instructions. Cervical strengthening exercises included supine and sitting craniocervical flexion to elicit contraction of the deep neck flexor muscles without contraction of superficial neck muscles. Scapular retraction against resistance using elastic bands or pulleys could beadded. Scapular-strengthening exercises included prone horizontal abduction, sidelying forward flexion, prone extension of each shoulder, as well as prone push-ups with emphasis on shoulder protraction. • *Dose*: Goal cranio-cervical flexioni exercise 10 repetitions of 10 sec contraction supine and 30 repetitions in sitting. Scapular exercise aiming at 3 sets of 10 repetitions. All patients were scheduled to receive 10 individual physicaltherapy sessions over a 4-week treatment period: 3 sessions per week for the first 2 weeks, and 2 sessions per week forthe final 2 weeks. Each session was 30 to 45 minutes in duration. Exercise + traction • *content*: as exercise + Traction applied with a Saunders 3D ActiveTrac or Chattanooga Triton table (DJO, LLC, Vista, CA). • *Dose*: The angle of pull for the traction was 15° of cervical flexion but could be adjusted to maximize comfort. Intermittent traction with 60 seconds of pull force and 20 seconds of relaxation force was used. An initial pull force of 5.44 kg (12 lb) was used and incrementally adjusted based on the patient tolerance and symptom response.15 minutes Exercise + over-door traction • *content*: as exercise + ChattanoogaOverdoor Traction Device (DJO, LLC). During treatment sessions and at home. An initial traction force of 3.63 to 5.44 kg (8-12 lb) was used, based on tolerance and symptom response, with the goal of maximizing symptom reduction and centralization. Force was adjusted tothe maximum of 9.07 kg.15 minutes traction time • *Dose*: 15 minutes. Inital force 3.63-5.44 kg according to symptoms. Increase during time accoring to symptoms.
Outcomes	*Continuous*: • Arm pain (0-10) • Neck pain (0-10) • Neck Disability Index (0-100) *Dichotomous*: • drop out • Surgery
Identification	**Sponsorship source:** Supported by a grant from DJO, LLC **Country:** US **Setting:** Physical therapy and rehabilitation outpatient clinic **Comments:** Solely physioterapists **Authors name:** JULIE M. FRITZ **Institution:** Department of Physical Therapy **Email:** julie.fritz@utah.edu **Address:** University of Utah, Salt Lake City, UT
Notes	**Identification:** **Participants:** **Study design:** **Baseline characteristics:** **Intervention characteristics:** **Pretreatment:** **Continuous outcomes:** **Dichotomous outcomes:** **Adverse outcomes:**

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Comment: Web based randomization generator in opaque envelopes.
Allocation concealment (selection bias)	Low risk	Quote: "Randomiza- tion was conducted using opaque, sealed envelopes prepared prior to beginning enrollment. Allocation sequences were generated in block sizes of 6, 8, or 10, us- ing a web-based randomization generator (www.randomization.com). A research as- sistant opened randomization envelopes after completing all baseline activities."
Blinding of participants and personnel (performance bias)	High risk	Comment: Qs usual in this type of studies it is not possible to blind either patient or clinician
Blinding of outcome assessment (detection bias)	Low risk	Comment: Blinded observers are provided

Incomplete outcome data (attrition bias)	High risk	Quote: "Analyses were based on intention-to-treat principles, with all pa- tients analyzed with the group to which they were randomized." Comment: drop outs are unclear Quote: "One patient crossed from mechani- cal to over-door traction due to difficulty lying supine."
Selective reporting (reporting bias)	Low risk	Comment: Standard outcome measures of NDI and pain are used and no reason to expect selective outcomes
Other bias	High risk	Comment: baseline differences are present for several variables:Man kan und sig over at træninsgruppen blev forværret efter 4 uge. Man skulle måske hanve ladet dem passsig selv. er er et ptoblem med iagnostikken - inklusionskriterierne uklare og ikke i oveensstemelse med sædvanlig praks.

Jellad 2009

Methods	**Study design:** Randomized controlled trial **Study grouping:** Parallel group **Open Label:** **Cluster RCT:**
Participants	**Baseline Characteristics** Physiotherapy + maual traction • *Participants (number)*: 13 • *sex (% males)*: 31 • *symptom duration (month)*: <3 • *Microtrauma (%)*: 38 • *Unemployed (%)*: 15 Physiotherapy + mechanical traction • *Participants (number)*: 13 • *sex (% males)*: 23 • *symptom duration (month)*: <3 • *Microtrauma (%)*: 23 • *Unemployed (%)*: 15 Physiotherapy • *Participants (number)*: 13 • *sex (% males)*: 15 • *symptom duration (month)*: <3 • *Microtrauma (%)*: 31 • *Unemployed (%)*: 23 **Included criteria:** Recent CR (i.e. onset within the previous 3 months), involvement of spinal nerve with HD and/or intervertebral disc degeneration confirmed by imaging and concordant radiographic and clinical results. **Excluded criteria:** History of surgery or bone-ligament damage to the cervicalspine, shoulder disease (rotator cuff syndrome, capsulitis,acromioclavicular arthropathy, shoulder instability or inflammatory arthritis) or carpal tunnel syndrome, ongoing or recent rehabilitation for the current CR and the worsening of pain or intolerance in a manual cervical traction test performed by the clinician during the first consultation.
Interventions	**Intervention Characteristics** Physiotherapy + maual traction • *content*: “standard’’ rehabilitation programme involvingphysical pain relief methods (ultrasound, infrared andmassage), cervical spine mobilisation and muscle strengthening via isometric contraction of flexor and extensor muscles, followed by stretching exercises and self-expansion for the spinal muscles. • *dose*: Manual, intermittent cervical traction (20 20-secondtractions, a 10-second inter-traction rest period) were performed by designated physiotherapists. A force ofaround 6 kg was applied. Physiotherapy + mechanical traction • *content*: “standard’’ rehabilitation + mechanical traction in the supine position with a weightbearig pulley system. • *dose*: Each session comprised two 25-minute tractions, with a 10-minute rest interval. The weight was gradually increased from five to 12 kg. Physiotherapy • *content*: "Standard" rehabilitation • *dose*: 3 sessions x 4 weeks = 12 sessions
Outcomes	*Continuous*: • Neck Pain • Radicular pain • Disability (VAS) • Analgesics (tablets/day)
Identification	**Sponsorship source:** not declared **Country:** Tunesia **Setting:** Monastir University Hospital **Comments:** **Authors name:** A. Jellad **Institution:** Service de me´decine physique et re´adaptation **Email:** anisjellad@gmail.com **Address:** CHU F. Bourguiba, 1753 Monastir, Tunisia
Notes	**Identification:** **Participants:** **Study design:** **Baseline characteristics:** **Intervention characteristics:** **Pretreatment:** **Continuous outcomes:** *Alice Kongsted* Means calculated from chaneg-scores in bar charts. No SDs available **Dichotomous outcomes:** **Adverse outcomes:**

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Comment: No reporting on the randomization procedure.
Allocation concealment (selection bias)	Unclear risk	Comment: The study procedures has not been described in sufficient detail

Blinding of participants and personnel (performance bias)	High risk	Comment: Not mentioned, bliniding of participants and clinicians not possible
Blinding of outcome assessment (detection bias)	Low risk	Comment: The outcome assessor was blindedand Patient reported outcome measures
Incomplete outcome data (attrition bias)	Low risk	Quote: "None of the patients was lost to follow-up." Comment: There were no drop outs reported.
Selective reporting (reporting bias)	Low risk	Comment: Standard measures of outcomes suggest no selective reporting, but no protocol has been published
Other bias	High risk	Comment: No sample size calculation, very small groups (3 x 13), those not tolerating traction at first visit were excluded, baseline differences not accounted for in the analyses. Comparison treatment not described.No trial registration

Young 2009

Methods	**Study design:** Randomized controlled trial **Study grouping:** Parallel group **Open Label:** **Cluster RCT:**
Participants	**Baseline Characteristics** Physiotherapy + traction • *Participants (number)*: 45 • *Sex, n (%) males*: 14 (31.1) Physiotherap + sham traction • *Participants (number)*: 36 • *Sex, n (%) males*: 12 (33) **Included criteria:** ● Age 18–70 y● Unilateral upper-extremity pain, paresthesia, or numbness● 3 of 4 tests of clinical prediction rule positive:- Spurling test- Distraction test- Upper-Limb Tension Test 1- Ipsilateral cervical rotation 60° **Excluded criteria:** ● History of previous cervical or thoracic spine surgery● Bilateral upper-extremity symptoms● Signs or symptoms of upper motor neuron disease● Medical “red flags” (eg, tumor, fracture, rheumatoid arthritis, osteoporosis,prolonged steroid use)● Cervical spine injections (steroidal) in the past 2 wk● Current use of steroidal medication prescribed for radiculopathy symptoms
Interventions	**Intervention Characteristics** Physiotherapy + traction • *content*: manual therapy, exercise, and intermittent cervical tractionhome exercise • *dose*: Manual treatment: Therapists were required to perform at least one technique targeting the upper thoracic spine and one technique targetingthe mid thoracic spine during each visit. Following treatment directed at the thoracic spine, at least one set (30 seconds or 15–20 repetitions) of a nonthrust manipulation was directed at each desired level of the cervical spine. Exercise: At least one exercise was used during each treatment visit. Traction: The traction force was started at 9.1 kg (20 lb) or 10% of the patient’s body weight (whichever was less) and increased approximately 0.91 to 2.27 kg (2–5 lb) every visit, depending on centralization or reduction of symptoms. The maximum force used was 15.91 kg (35 lb). The on/off cycle was set at 50/10. Duration of traction was 15 minutes. • *Symptoms3months n (%)*: 27 (60) Physiotherap + sham traction • *content*: manual therapy, exercise, andsham intermittent cervical tractionHome exercise • *dose*: Manual treatment: Therapists were required to perform at least one technique targeting the upper thoracic spine and one technique targetingthe mid thoracic spine during each visit. Following treatment directed at the thoracic spine, at least one set (30 seconds or 15–20 repetitions) of a nonthrust manipulation was directed at each desired level of the cervical spine. Exercise: At least one exercise was used during each treatment visit. Traction: The traction force was set to 2.27 kg or less. Duration of the sham traction was 15 minutes. • *Symptoms3months n (%)*: 15 (42)
Outcomes	*Continuous*: • NPRS (0-10) • NDI (0-50) *Dichotomous*: • Drop out
Identification	**Sponsorship source:** This study was funded by a grant from theSaunders Group. **Country:** USA **Setting:** Orthopedic physical therapy clinics **Comments:** payment for treatment is not clear **Authors name:** Ian A. Young **Institution:** Dept of Phys Ther, Virginia Commonwealth University-Medical College **Email:** youngian@spinesport.org **Address:** Box 961,Tybee Island, GA 31328 (USA).
Notes	**Identification:** **Participants:** **Study design:** *Jesper NøRregaard* Per, I would prefer to describe the interventions as described in the paper: Manual therapy, exercise, and intermittent traction/sham traction **Baseline characteristics:** **Intervention characteristics:** **Pretreatment:** **Continuous outcomes:** *Jesper NøRregaard* I report unadjusted means **Dichotomous outcomes:** *Jesper NøRregaard* Jeg forstår ikke helt denne tabel. Ser ikke noget drop out ved baseline, men 6 i hver gruppe ved follow-up **Adverse outcomes:** *Jesper NøRregaard* Kan ikke finde rapporterede adverse events

Risk of bias table

Bias	Authors' judgement	Support for judgement

Random sequence generation (selection bias)	Low risk	Comment: Numbered, sequential, sealed envelopes containing group allocation for each clinic were opened by the evaluating therapist after the baseline examination.
Allocation concealment (selection bias)	Low risk	Quote: "In order to decrease the potential effect of the clinic on treatment outcomes, concealed randomization, stratified by clinic, was used to place patients into treat- ment groups. Numbered, sequential, sealed envelopes containing group allocation for each clinic were opened by the evaluating therapist after the baseline examination." Comment: In order to decrease the potential effect of the clinic on treatment outcomes, concealed randomization, stratified by clinic, was used to place patients into groups
Blinding of participants and personnel (performance bias)	High risk	Comment: In this type of study blinding of patients and clinicians is not possible.
Blinding of outcome assessment (detection bias)	Low risk	Quote: "Sup- port staff, who were unaware of group assignment, administered all patient self-report measures and grip strength testing as instructed by the therapist." Comment: Blinding of assessors is described
Incomplete outcome data (attrition bias)	Low risk	Comment: Mixed model and intention to treat togehter with clear reporting of outcomes minimize the risk of bias. Drop out rate is small.
Selective reporting (reporting bias)	Low risk	Comment: The use of standard outcome measures makes it unlikely that selective outcome reporting has occurred. However, no reference to published study protocol or trial registration
Other bias	Low risk	Comment: No other sources of bias detected

Footnotes

Characteristics of excluded studies

AlbayrakAydin 2012

Reason for exclusion	Wrong patient population

HussainShah 2013

Reason for exclusion	Wrong patient population

Jiang 2012

Reason for exclusion	Wrong comparator

KlaberMoffett 1990

Reason for exclusion	Wrong patient population

Lee 1996

Reason for exclusion	Wrong outcomes

Leonelli 2013

Reason for exclusion	Wrong intervention

Moffett 1990

Reason for exclusion	Wrong outcomes

Moustafa 2014

Reason for exclusion	Wrong patient population

Wong 1997

Reason for exclusion	Wrong outcomes

Zylbergold 1985

Reason for exclusion	Wrong patient population

Footnotes

Characteristics of studies awaiting classification

Footnotes

Characteristics of ongoing studies

Footnotes

Summary of findings tables

Additional tables

1 Risk of Bias

[Insert text]	[Insert text]	[Insert text]

Footnotes

References to studies

Included studies

BAPM 1966

Britisk Association of Physical Medicine. Pain in the neck and arm: a multicentre trial of the effects of physiotherapy, arranged by the British Association of Physical Medicine.. BMJ 1966;1(5482):253-258.

Fritz 2014

Fritz,J. M.; Thackeray,A.; Brennan,G. P.; Childs,J. D.. Exercise only, exercise with mechanical traction, or exercise with over-door traction for patients with cervical radiculopathy, with or without consideration of status on a previously described subgrouping rule: a randomized clinical trial. Journal of Orthopaedic & Sports Physical Therapy 2014;44(2):45-57. [DOI: http://dx.doi.org/10.2519/jospt.2014.5065]

Jellad 2009

Jellad,A.; Ben Salah,Z.; Boudokhane,S.; Migaou,H.; Bahri,I.; Rejeb,N.. The value of intermittent cervical traction in recent cervical radiculopathy.. Annals of

Physical and Rehabilitation Medicine 2009;52(9):638-652. [DOI: http://dx.doi.org/10.1016/j.rehab.2009.07.035]

Young 2009

Young,I. A.; Michener,L. A.; Cleland,J. A.; Aguilera,A. J.; Snyder,A. R.. Manual therapy, exercise, and traction for patients with cervical radiculopathy: a randomized clinical trial. Physical Therapy 2009;89(7):632-642. [DOI: http://dx.doi.org/10.2522/ptj.20080283]

Excluded studies

AlbayrakAydin 2012

Albayrak Aydin,N.; Yazicioglu,K.. Cervical intermittent traction: Does it really work incervical radiculopathy due to herniated disc?.. Turkiye Fiziksel Tip ve Rehabilitasyon Dergisi 2012;58(4):277-282. [DOI: http://dx.doi.org/10.4274/tftr.44712]

HussainShah 2013

Hussain Shah,S. I.; Nawaz,F.; Naveed-e-Imtiaz,S.; Hanif,A.. A statistical evaluation of mechanical and segmental traction in patients of cervicalgia.. Rawal Medical Journal 2013;38(3):260-262. [DOI:]

Jiang 2012

Jiang,C. -B; Wang,J.; Zheng,Z. -X; Hou,J. -S; Ma,L.; Sun,T.. Efficacy of cervical fixed-point traction manipulation for cervical spondylotic radiculopathy: A randomized controlled trial.. Journal of Chinese Integrative Medicine 2012;10(1):54-58. [DOI: http://dx.doi.org/10.3736/jcim20120109]

KlaberMoffett 1990

Klaber Moffett,JA; Hughes,GI; Griffiths,P.. An investigation of the effects of cervical traction. Part 1: Clinical effectiveness. Clinical rehabilitation 1990;4(3):205-211. [DOI: 10.1177/026921559000400304]

Lee 1996

Lee,M. Y.; Wong,M. K.; Tang,F. T.; Chang,W. H.; Chiou,W. K.. Design and assessment of an adaptive intermittent cervical traction modality with EMG biofeedback.. Journal of Biomechanical Engineering 1996;118(4):597-600. [DOI:]

Leonelli 2013

Leonelli,C.; Zucchini,E.; Messora,A.; Sartini,S.; Fontana,L.; Parazza,S.. Neurodynamic technique benefits in patients with chronic cervical radiculopathy: a pilot study.. Scienza Riabilitativa 2013;15(4):19-29. [DOI:]

Moffett 1990

Moffett,JA Klaber; Hughes,GI; Griffiths,P.. An investigation of the effects of cervical traction: Part 2: The effects on the neck musculature. Clinical rehabilitation 1990;4(4):287-290. [DOI: 10.1177/026921559000400406]

Moustafa 2014

Moustafa,I. M.; Diab,A. A.. Multimodal treatment program comparing 2 different traction approaches for patients with discogenic cervical radiculopathy: a randomized controlled trial.. Journal of Chiropractic Medicine 2014;13(3):157-167. [DOI: http://dx.doi.org/10.1016/j.jcm.2014.07.003]

Wong 1997

Wong,A. M.; Lee,M. Y.; Chang,W. H.; Tang,F. T.. Clinical trial of a cervical traction modality with electromyographic biofeedback.. American Journal of Physical Medicine & Rehabilitation 1997;76(1):19-25. [DOI:]

Zylbergold 1985

Zylbergold,R. S.; Piper,M. C.. Cervical spine disorders. A comparison of three types of traction.. Spine 1985;10(10):867-871. [DOI:]

Studies awaiting classification

Ongoing studies

Other references

Additional references

Other published versions of this review

Classification pending references

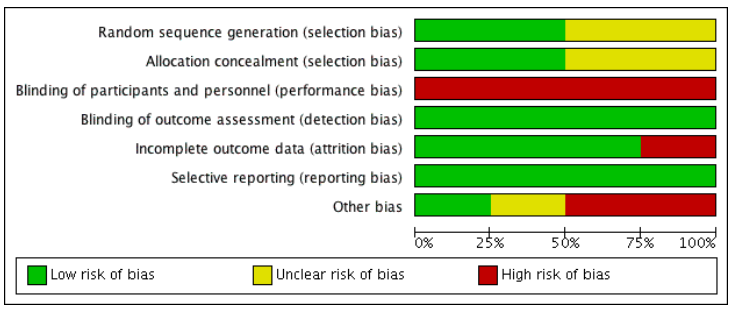
Data and analyses

3 Physiotherapy/Exercise/ + traction vs Physiotherap/exercise/sham

Outcome or Subgroup	Studies	Participants	Statistical Method	Effect Estimate
3.1 NPRS (0-10)	2	154	Mean Difference (IV, Random, 95% CI)	-0.44 [-1.45, 0.56]
3.1.2 4 weeks	2	154	Mean Difference (IV, Random, 95% CI)	-0.44 [-1.45, 0.56]
3.2 NDI (0-50)	2	154	Std. Mean Difference (IV, Random, 95% CI)	-0.04 [-0.36, 0.29]
3.2.2 4 weeks	2	154	Std. Mean Difference (IV, Random, 95% CI)	-0.04 [-0.36, 0.29]
3.3 Drop out	0		Risk Ratio (IV, Fixed, 95% CI)	No totals
3.3.1 4 weeks	0		Risk Ratio (IV, Fixed, 95% CI)	No totals

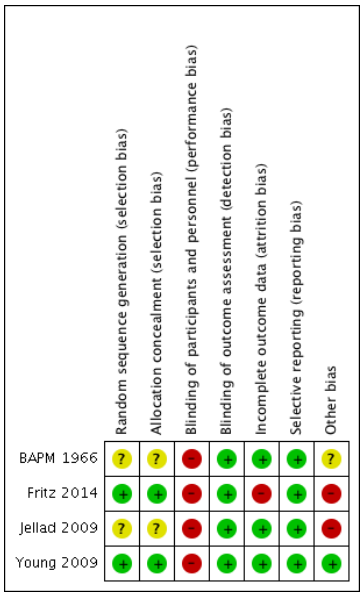
Figures

Figure 1



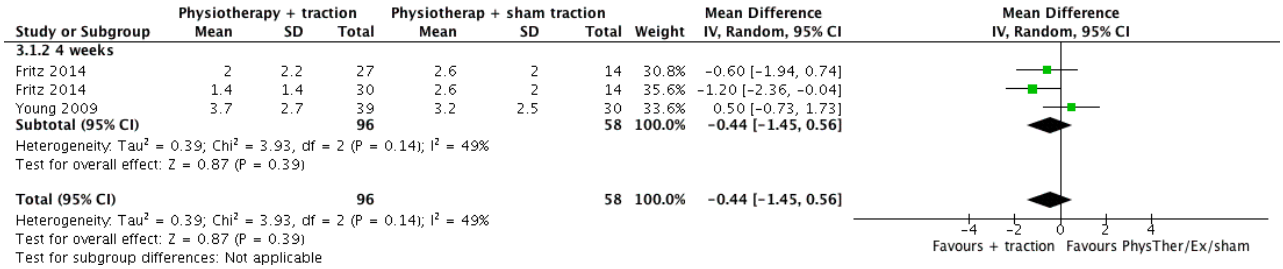
Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.

Figure 2



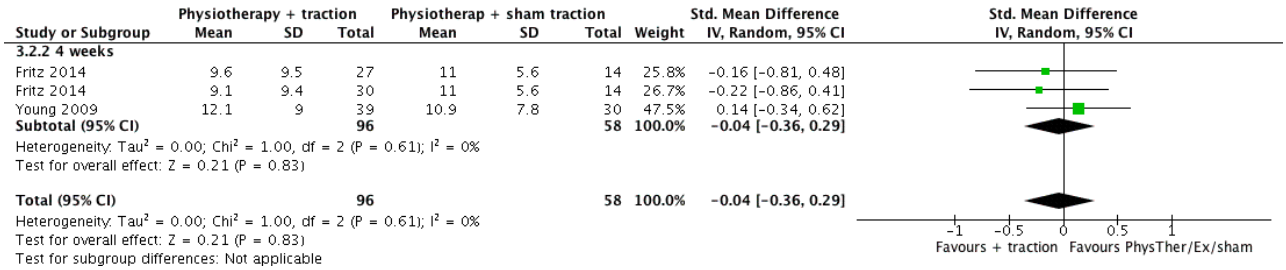
Risk of bias summary: review authors' judgements about each risk of bias item for each included study.

Figure 3 (Analysis 3.1)



Forest plot of comparison: 3 Physiotherapy/Exercise/ + traction vs Physiotherap/exercise/sham, outcome: 3.1 NPRS (0-10).

Figure 4 (Analysis 3.2)



Forest plot of comparison: 3 Physiotherapy/Exercise/ + traction vs Physiotherap/exercise/sham, outcome: 3.2 NDI (0-50).

Sources of support

Internal sources

- No sources of support provided

External sources

- No sources of support provided

Feedback

Appendices