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The Effectiveness of Behavioural  
Intervention for Acute Whiplash  
Associated Disorder (WAD) II

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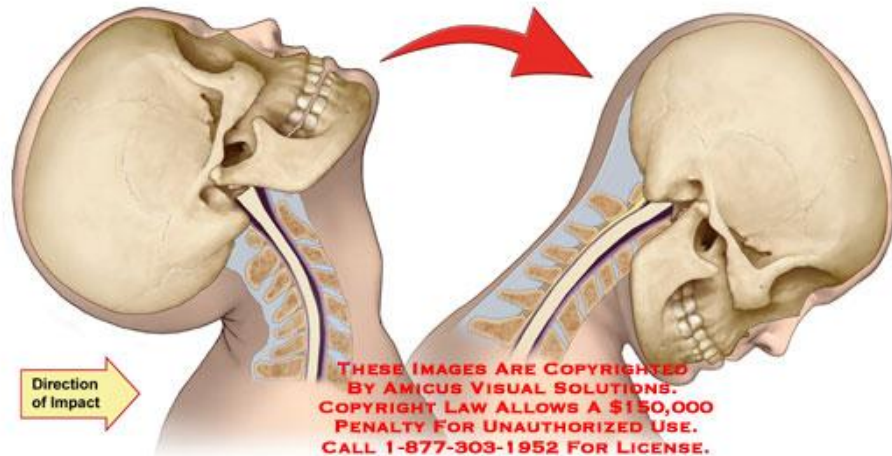
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# Mechanism of Cervical Injury



**HYPEREXTENSION**  
Head and Neck

**HYPERFLEXION**  
Head and Neck



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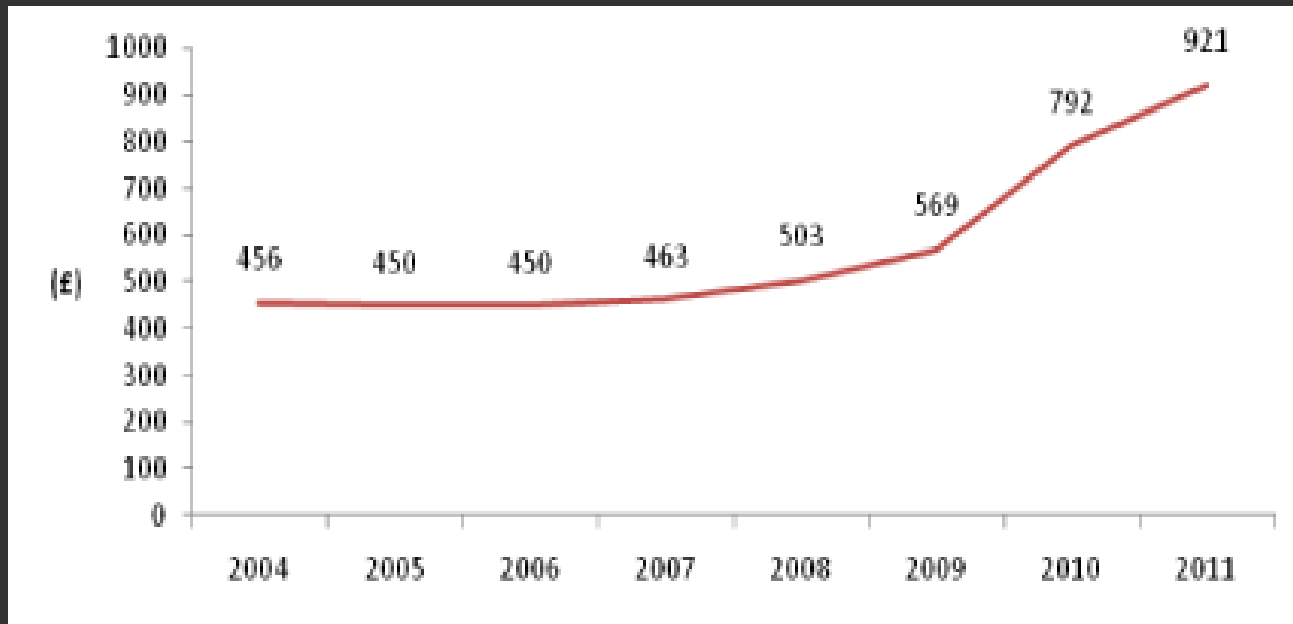
# Whiplash Associated Disorder (WAD)

- ❖ Increased incidence *(Holm et al., 2008)*
- ❖ The UK = 'Whiplash Capital of Europe' *(Mooney, 2012)*
- ❖ The UK incidence 300,000 people annually *(Burton, 2003)*

# Whiplash Associated Disorder (WAD)

- ❖ The risen of cost of claims 7 to 14 £ billion

*(Mooney, 2012)*



<http://www.publications.parliament.uk/pa/cm201314/cmselect/cmtran/117/117vw56.htm>

# Whiplash Associated Disorder (WAD)

- ❖ 40-60% chronic conditions

*(Sterling et al., 2005; Carroll et al., 2008; Merrick et al., 2010)*

- ❖ 30% moderate to severe pain and disability

*(Jull et al., 2011)*



# WAD Problems

## ❖ Physical

- Pain *(Lord et al., 1996; Thompson et al.; 2010)*
- Decreased cervical range of motion  
*(Spitzer et al., 1995; Harling et al., 2001)*
- Muscle weakness *(Spitzer et al., 1995)*

## ❖ Psychological

- Fear of Movement
- Anxiety
- Depression

*(Carroll, 2011; Sterling et al., 2011; Sterling, 2014)*

# The Classification of WAD

Grade	Classification
0	No neck complaint(s) or sign(s)
I	Neck complaint of pain, stiffness or tenderness but no physical sign(s)
II	Neck complaint and musculoskeletal sign(s) (decrease range of motion, point tenderness, etc.)
III	Neck complaint and neurological sign(s) (decreased or absent tendon reflex, weakness, sensory deficits)
IV	Neck complaint and fracture or dislocation

*(Spitzer et al., 1995)*

# Behavioural intervention

- Act-as-usual
- Education
- Self-care
- Regularly exercise





# Objective:

To evaluate the effectiveness of behavioural physiotherapy intervention for the management of acute Whiplash Associated Disorder (WAD) II



# Method

- ❖ Systematic review and meta-analysis of randomised controlled trials
  - Pre-defined protocol
  - The Back Review Group of the Cochrane Collaboration
  - The Cochrane handbook
  - PRISMA

# Eligibility criteria using PICOS

<b>Population</b>	Acute (<4 weeks) WADII
<b>Intervention</b>	Any behavioural intervention
<b>Comparison</b>	Standard/control intervention
<b>Outcome</b>	Clinical relevant outcomes base on the International Classification of Function, Disability and Health (ICF)
<b>Study design</b>	Randomised controlled trial

# Method

- ❖ Two independent reviewers searched up to 1<sup>st</sup> January 2014
  - PEDro, Medline, Embase, AMED, CINAHL, PsycINFO, and Cochrane Library
  - Key journals (e.g. Spine, Manual Therapy, Physiotherapy, etc.)
  - Reference lists
  - Grey literature
  - Active researchers

# Method

Risk of bias assessment



Cochrane RoB tool



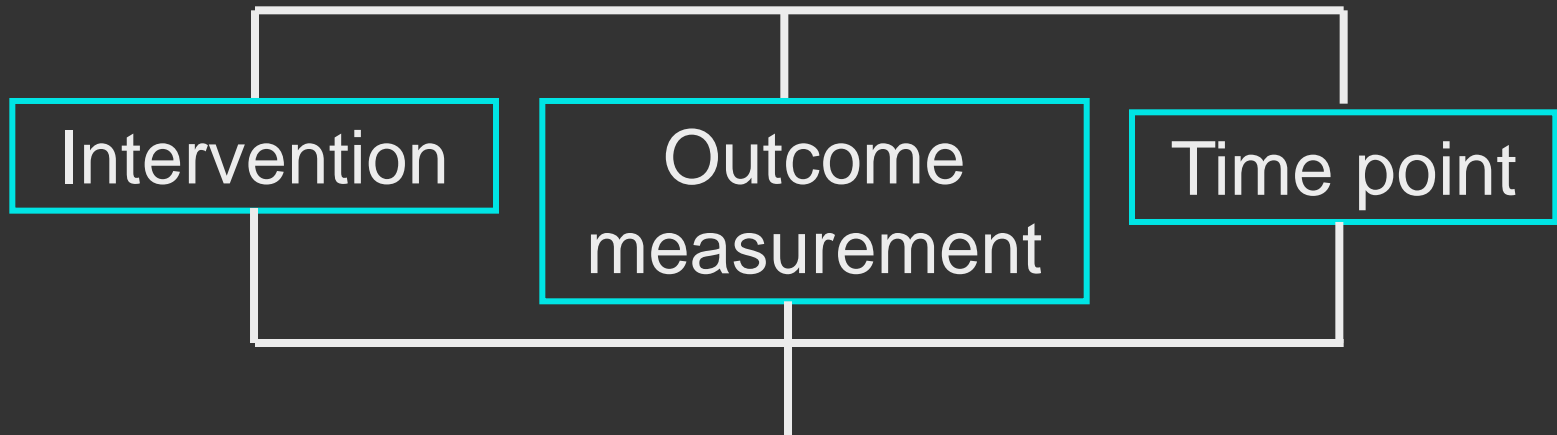
Kappa Measure of Agreement

# Method

Data extraction

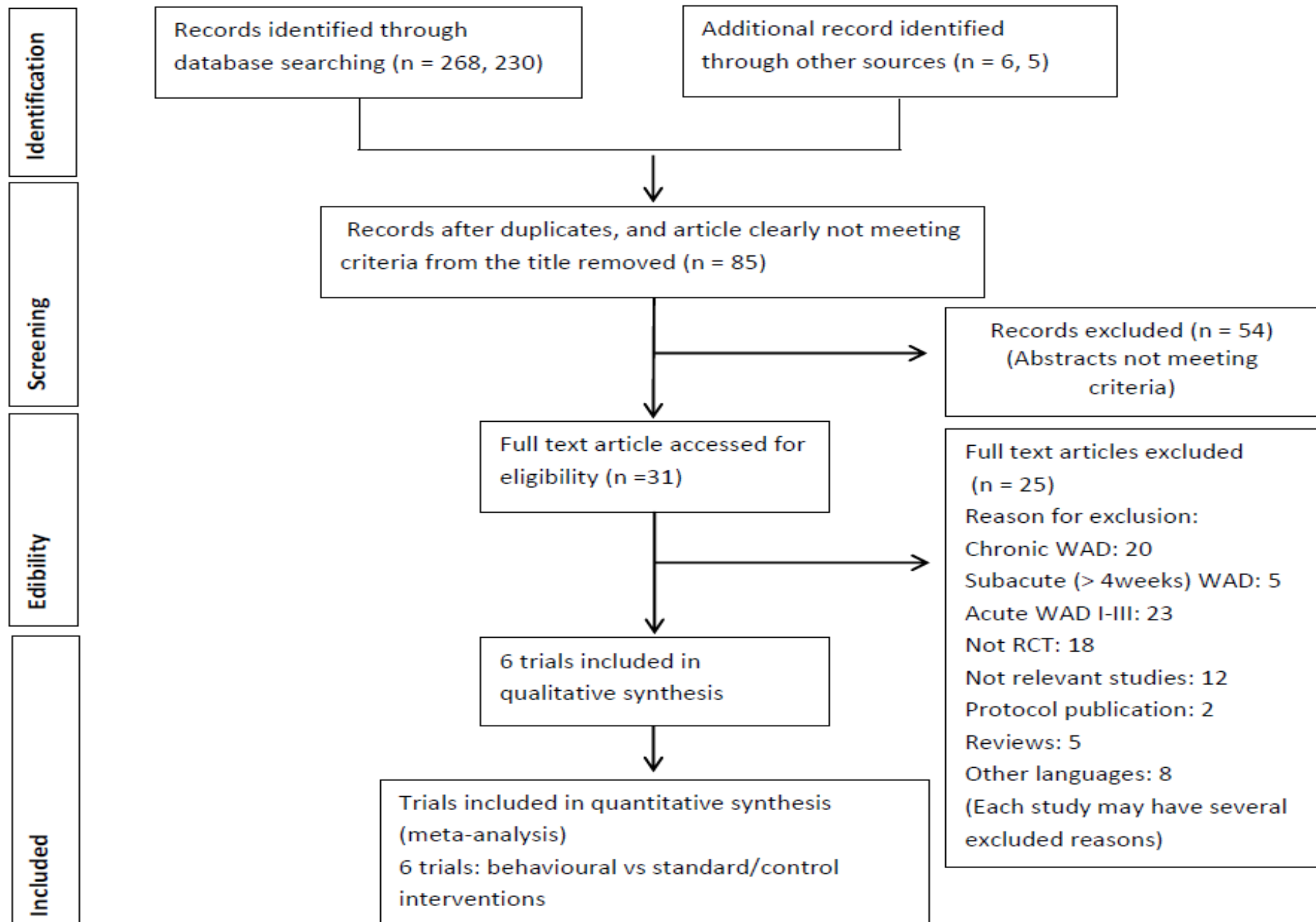


Comparability



Meta-analyses

### Study selection flow diagram (Moher et al., 2009)



# Results

- Included 6 RCTs (*Borchgrevink et al., 1998, Bonk et al., 2000, Schnabel et al., 2004, Ferrari et al., 2005, Vassiliou et al., 2006, Ottosson et al., 2007*)
- 987 participants across 4 countries  
(Germany, Norway, Canada, Sweden)
- All high risk of bias
- $K = 0.87$



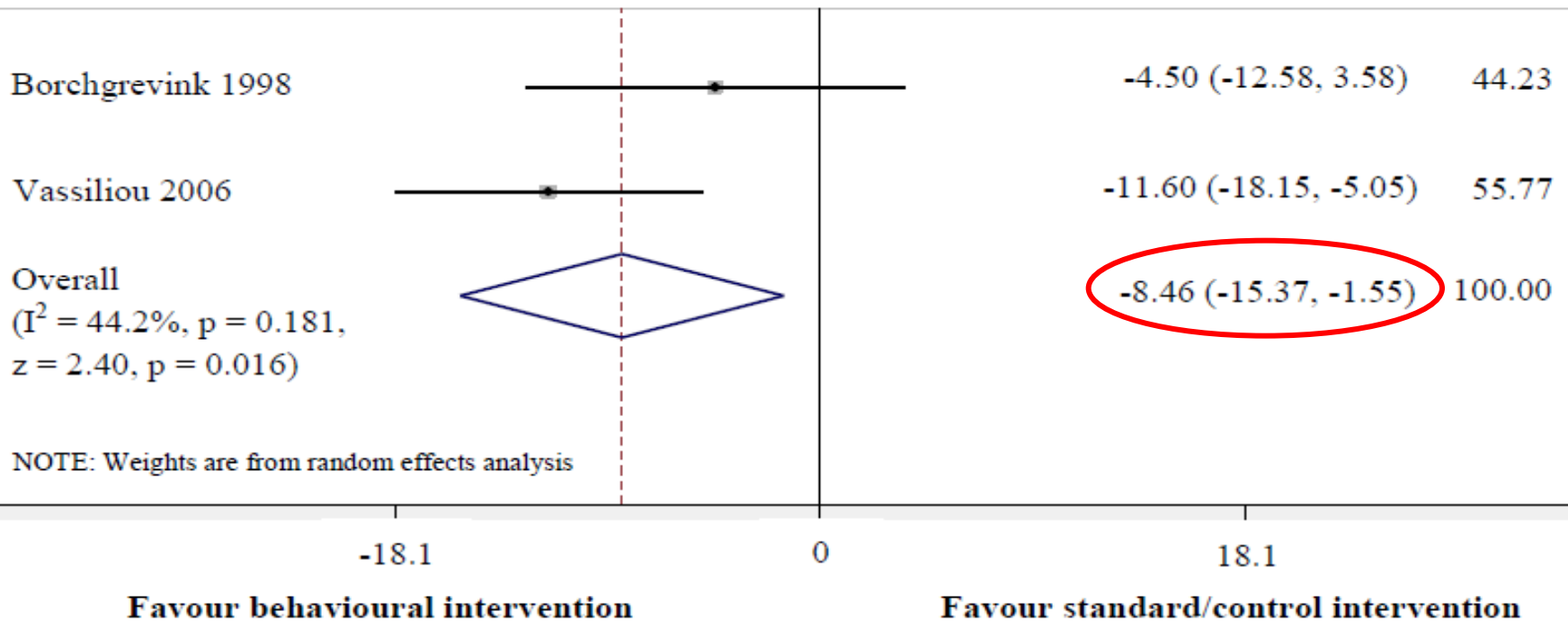


# Summary Quantitative Synthesis

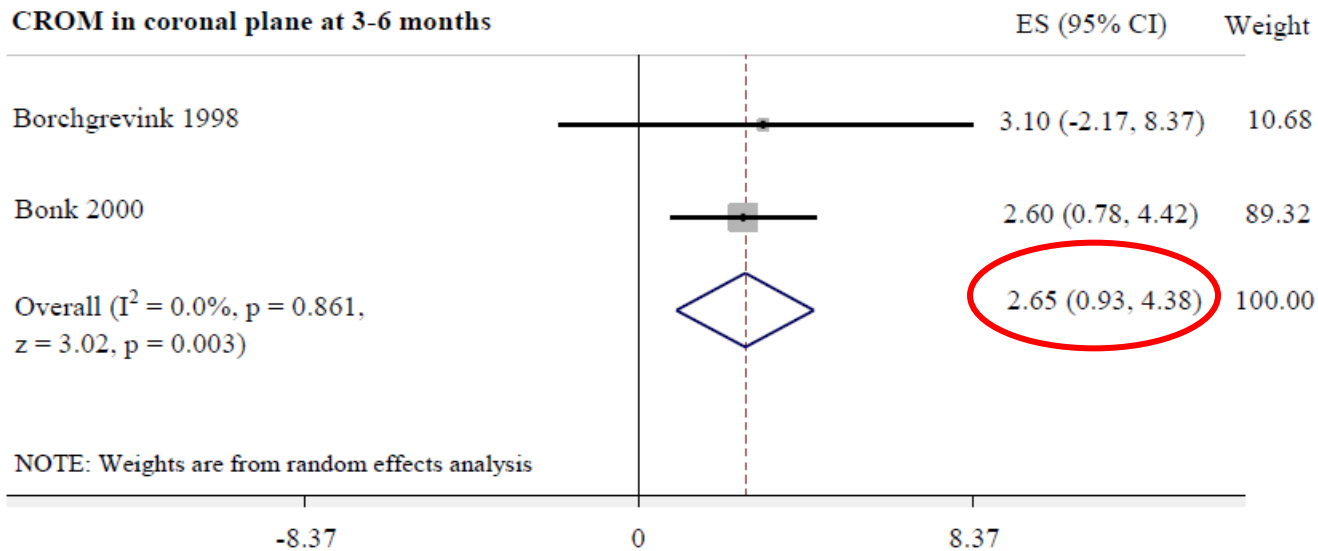
Behavioural vs standard/control interventions	I <sup>2</sup> (%)	95% CI	P-value
Pain intensity (VAS) at 6 weeks	70.0 <sup>†</sup>	-12.90, 2.19	0.164
at 6 months	44.2	-15.37, -1.55	0.016*
CROM in coronal plane at 3-6 months	0.0	0.93, 4.38	0.003*
horizontal plane at 3-6 months	0.0	0.43, 5.46	0.027*

\* *Statistical significance*

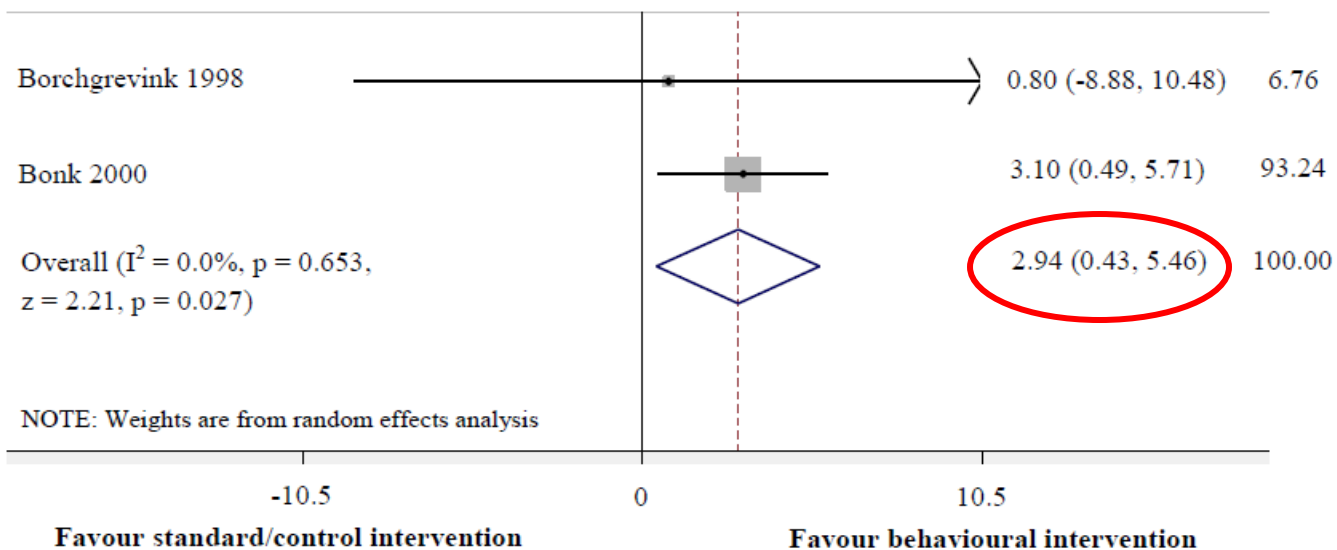
### VAS at 6 months



### CROM in coronal plane at 3-6 months



### CROM in horizontal plane at 3-6 months



# Discussion

- ❑ Although statistically significant, findings were not clinically significant
- ❑ High risk of bias trials reduces confidence in findings
- ❑ Very low level of evidence according to the Grading of Recommendations Assessment, Development and Evaluation system (GRADE)

# Conclusion

Behavioural intervention may be useful for reducing pain and promoting cervical mobility in patients with acute WADII in the short-medium terms.



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