CORE TRAINING AS A PREVENTION TOOL

Author: Sílvia Perera i Orriols
Tutor: Júlia Jubany i Güell

Bibliographical search:
Physiotherapy in musculoskeletal disorders
2012-2013
OVERVIEW

Introduction
Purpose
Method
Results
Discussion
Conclusions
Low back pain (LBP) → High prevalence

Stability concept

Stability: Local and global systems

According to Bergmark’s study of mechanical stability

**Local system:** Muscles attached to the lumbar vertebrae

**Global system:** Muscles and intra-abdominal pressure → direct load transfer between thoracic cage and pelvis

- **ESg:** global erector spinae
- **IO:** internal oblique
- **EO:** external oblique
- **RA:** rectus abdominis

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**Introduction**

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According to Panjabi’s theory
Core concept → Core training

The Core as a muscular box

Diaphragm
Transversus abdominis
Multifidus
Muscles of pelvic floor

Postural Adjustments
External loads
Lumbopelvic Region
Muscle Activation
Spinal Ligament Deformation
Muscle Spindles
Golgi Tendon Organs
Neural Feedback
Stability Requirement

Model of Core Stability

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Prevention

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Purpose

• **Main**: Primary prevention of lumbar spine disorders

• **Secondary**: Prevention of LBP recurrences, injuries and other musculoskeletal disorders
Combining:
“core training” or
“core stability” or
“core strengthening” or
“lumbar stabilization” or
“lumbar stability” or
“stability” or
“instability” or
“lumbar instability”
and
“biomechanics”
and
“low back pain” or
“chronic low back pain”
and
“prevention”
Criteria

• Inclusion:
  • Articles studying the effects of CT according to purposes of this paper
  • Only publications in English language
  • Articles in INDEXED / IMPACT FACTOR magazines
  • No limits in publication date
  • Only articles with full text available

• Exclusion:
  • All studies not accomplishing the inclusion criteria
  • All studies related to medical, surgical and pharmacological aspects of LBP
  • All studies reporting treatment strategies not related to lumbar stabilisation
• Data analysed:
  • Sample
  • Purpose
  • Intervention
  • Outcome measures / follow-up
  • Results
  • Prevention effects

19 CLINICAL TRIALS

1. Richardson et al. (2002)
2. Hides et al. (2001)
3. Durall et al. (2009)
5. Tse et al. (2005)
7. Costa et al. (2009)
10. O’Sullivan et al. (1997)
14. Peate et al. (2007)
15. Carpes et al. (2008)
17. Stuge et al. (2004)
18. Moon et al. (2013)
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**PURPOSE**

- Prevention: 37%
- Effects: 32%
- To compare: 21%

**STUDIES RESULTS**

- Primary Prevention: 11%
- Pain reduction: 26%
- Prevention of Recurrences: 16%
- General Function Improvement: 68%

**PREVENTION**

- First episodes: 11%
- Recurrences: 37%
- Injuries: 47%
- Other effects: 5%
According to purpose:

- Weak evidence as a primary prevention tool
- Slight signs of direct or indirect preventive effects
  - Direct: evidence in results
  - Indirect: as a consequence of other effects
• **Direct preventive effect:**
  - (Dir.PP) Primary prevention
  - (Dir.PR+I) Preventing recurrences and injuries

• **Indirect preventive effect:**
  - (Indir. As Consec) Signs of prevention as a consequence of pain and functionality improvement or decrease of need of treatment

• *(NoPrev)* No prevention

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**Preventive effects**

- **Dir. PP**
  - Durall
  - Peate

- **Dir. PR+I**
  - Richardson
  - Stuge
  - Hides
  - Moseley

- **Indir. As Consec**
  - Tse
  - Niemistö
  - Cosio-Lima
  - O'Sullivan
  - Kumar
  - Costa
  - Rasmussen-Barr

- **NoPrev**
  - Goldby
  - Koumantakis
But...

Initial state

Studies

Asymptomatic 1st episode LBP LBP /CLBP PGP

Richardson Durall Cosio-Lima Tse Peate Hides Nadler

Koumantakis Norris Rasmussen-Barr Costa O’Sullivan Carpes Moon Moseley Niemistö Goldby

Stuge

Introduction Purpose Method Results Discussion Conclusions
But...

Follow-up / Sample

Days/Persons

Follow-up  Sample size

Introduction  Purpose  Method  Results  Discussion  Conclusions
Concluding...

- Weak evidence of preventive effect
- Strong evidence of efficacy in pain reduction and treatment
- Limitations in:
  - Size and type of sample
  - Insufficient follow-up
- Need of further studies with long-term follow-up
- CT in primary prevention programs
THANK YOU FOR YOUR ATTENTION

www.standuppaddlingfitness.com