The effects of core and lower extremity strengthening on pregnancy-related low back and pelvic girdle pain: a systematic review
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CRD summary
This review concluded that most studies reported a reduction in pain with exercise, but there was insufficient evidence to support exercise as the standard treatment for pregnancy-related back pain and pelvic girdle pain. These conclusions reflect the evidence presented, but the limitations of the methods and reporting mean that the conclusions may not be wholly reliable.

Authors' objectives
To determine the effects of core stability and lower extremity strengthening exercise on pregnancy-related low back pain and pelvic girdle pain.

Searching
Five databases (including MEDLINE, CINAHL, and The Cochrane Library) were searched for studies written in English; search dates were not reported. Google Scholar was used to search the Internet and reference lists of included studies were searched to locate further studies. Search terms were reported.

Study selection
Studies that evaluated the effects of physical therapy or a fitness programme (for individuals or groups) on low back pain and pelvic girdle pain intensity, during pregnancy, were included. Eligible studies had to compare the intervention with another intervention or a control group.

In the included studies, where reported, the mean age of participants by group ranged from 24.8 to 29.7 years. Eligible gestation periods differed across the studies (ranging from eight to 35 weeks). Most exercise interventions targeted similar muscle groups and included stretching and strengthening. Intervention sessions were delivered once to three times weekly, for between two and 30 weeks. Pain measures varied across the studies (not all of them measured intensity); pain was measured at various locations including the back, lower back, pelvis and symphysis pubis. Most control groups received no intervention.

Assessment of study quality
Two reviewers assessed study quality using the Physiotherapy Evidence Database (PEDro) scale. Scores of 0 to 4 were considered poor quality, scores of 5 to 6 were fair quality, and scores of 7 to 10 were high quality.

Data extraction
Data on pain intensity and other post hoc outcomes, such as exercise benefits, days of sick leave, mobility, and adverse effects, were extracted. The authors did not state how many reviewers extracted the data.

Methods of synthesis
The data were presented in a narrative synthesis.

Results of the review
Seven studies were included in the review (number of participants not reported). Four were randomised controlled trials, two were quasi-experimental studies, and one was a randomised clinical trial without a true control group (this trial compared land-based versus water-based exercise). Studies were rated as being of fair (five studies) or high quality (two studies). Where reported, follow-up ranged from one week to 12 months after giving birth.

Five of seven studies reported significant reductions in the intensity or presence of pain with the intervention, compared with control. Other intervention benefits included decreased lordosis (curvature of the spine; one study), fewer days of
sick leave (two studies), decreased general discomfort (one study), and improved mobility (one study).

One study reported a significant decrease in low back pain with water-based exercise, compared with land-based exercise, but no difference in pelvic girdle pain. None of the exercise interventions were found to adversely affect the pregnant women or their foetuses. Further results were reported.

**Authors’ conclusions**
Most studies reported a reduction in pain with exercise, but the evidence was insufficient to support exercise as the standard treatment for pregnancy-related back pain and pelvic girdle pain. None of the interventions were found to adversely affect the pregnant women or their foetuses.

**CRD commentary**
The review question and inclusion criteria were broad and clearly defined. Relevant databases were searched, but the restriction to papers in English means that relevant studies may have been missed. Efforts were taken to minimise reviewer error and bias in the quality assessment, but this was not the case for study selection, and was unclear for data extraction.

Study details were presented, revealing clinical and methodological diversity between the studies; a narrative synthesis was appropriate. The sizes of the study samples were not reported, nor were their statistical results. This made it impossible to judge the strength and precision of the findings. As the objective was to compare exercise with other interventions or no treatment, it was unclear why a study comparing two different types of exercise was included.

The authors’ conclusions reflect the evidence presented, but the limitations of the methods and reporting mean that these conclusions may not be wholly reliable.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implications for clinical practice.

**Research:** The authors stated that large, high-quality studies were needed to conclusively determine the effects of exercise during pregnancy on the prevention or treatment of pregnancy-related back pain and pelvic girdle pain. They suggested that research should investigate whether regular combined aerobic and resistance exercise might affect a pregnant women differently than resistance exercise alone.

**Funding**
Not stated.

**Bibliographic details**

**DOI**
10.1097/JWH.0b013e318276fb16

**Original Paper URL**
http://journals.lww.com/jwhpt/Abstract/2012/09000/The__Effects__of__Core__and__Lower__Extremity.2.aspx

**Indexing Status**
Subject indexing assigned by CRD

**MeSH**
Humans; Pregnancy; Pregnancy Complications; Exercise Therapy; Physical Therapy Modalities; Low Back Pain; Pelvic Pain

**AccessionNumber**
12013006030
Date bibliographic record published
05/03/2013

Date abstract record published
25/03/2014

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.