

**Cramer H, Lauche R, et al. A Systematic Review and Meta-analysis of Yoga for Low Back Pain. Clin J Pain 2013;29(5):450-460.**

Design: Meta-analysis of randomized clinical trials

PICOS:

- Patient population: Adults with low back pain of any cause, duration, intensity, or radiation pattern
  - o Acute back pain was less than 6 weeks duration
  - o Subacute pain was 6-12 weeks duration
  - o Chronic pain was more than 12 weeks duration
- Intervention: Yoga as a main treatment intervention, regardless of yoga tradition, length, frequency, or duration
  - o Yoga as part of a multimodal intervention was excluded
  - o Studies of yogic lifestyle or meditation were excluded if yoga exercise was not the mainstay of treatment
- Comparison intervention: no treatment, usual care, education, exercise
  - o If studies had more than one comparison group, the control groups were selected in the following order of preference: no treatment, usual care, education, exercise
- Outcome measures: pain, back-specific disability, quality of life, generic disability such as work absenteeism, and global improvement
  - o “Short term” outcomes were considered to be those measured closest to 12 weeks after randomization; “long term” outcomes were those measured closest to 12 months after randomization
- Study types: Randomized controlled trials published as full papers in any language

Study selection:

- Two reviewers independently selected articles for inclusion and rated them for risk of bias
- Databases were MEDLINE, EMBASE, the Cochrane Library, PsycINFO, and CAMBASE, searched through January 2012, along with reference lists of original articles
- Risk of bias was based upon the methods of the Cochrane Back Review Group; studies that met 6 or more of 12 criteria were considered at low risk of bias
  - o Strong evidence was considered to be multiple RCTs with low risk of bias and consistent findings

- Moderate evidence meant consistent findings among multiple RCTs with high risk of bias and/or 1 low risk RCT
- Limited evidence meant 1 RCT with high risk of bias
- Conflicting evidence meant inconsistent findings among multiple RCTs
- No evidence meant no RCTs

#### Results:

- 12 full text articles were assessed for eligibility; 10 studies with 967 patients were selected for analysis
  - 2 studies compared yoga to usual care
  - 7 studies compared yoga to some form of education
    - 5 studies provided an educational book on self-care
    - 1 study provided a weekly newsletter on back care and 2 60-minute physical therapy education sessions
    - 1 study provided a detailed program on lifestyle and diet
  - 3 studies compared yoga to exercise programs, all of which were of the same duration and frequency as the yoga program
  - 8 studies were rated as having a low risk of bias
- Multiple outcome measures were used
  - 7 studies reported on pain
  - 8 studies reported back-specific disability
  - 5 studies reported a quality of life measure
  - 4 studies reported data on number of days with restricted activity, but the data was insufficient for meta-analysis
  - 2 studies reported on global improvement
- Short term treatment effects were estimated for pain, back-specific disability, quality of life, and global improvement
  - For pain, disability, and quality of life, treatment effects were reported as standardized mean differences (SMD)
    - SMD=0.2 to 0.5 is small
    - SMD=0.5 to 0.8 is moderate
    - SMD > 0.8 is large
  - For global improvement, the treatment effects were reported as relative risks (RR) , where the “risk” of global improvement is greater than 1 when the treatment is effective
- Short-term meta-analysis revealed “strong” evidence for effects of yoga on pain (SMD from 6 studies of 0.48 is “small” effect size) and for back-specific disability (SMD from 8 studies of 0.59 is moderate effect size), but no evidence was found for an effect on short-term quality of life

- The meta-analysis pooled evidence from control groups using exercise, educational booklets, and waiting list controls
- Heterogeneity of effects was not found for pain, but was found for back-specific disability
- Short term meta-analysis also pooled results from 2 studies to produce “strong” evidence of greater effectiveness of yoga over education for global improvement (RR was 3.27)
- Long-term meta-analysis showed moderate evidence for pain reduction (SMD from 5 studies was a small effect size of 0.33), and moderate evidence for lower disability (SMD from 5 studies was a small effect size of 0.35), but no evidence concerning quality of life
- Some subgroup analyses were done comparing yoga with defined interventions, when enough information was available
  - There was no evidence that yoga was superior to usual care (2 studies) for short-term disability
  - There was strong evidence (5 studies) that yoga was superior to education for pain and disability, but the effect size was small (0.45 SD)
    - There was strong evidence for yoga over education on short-term global improvement (RR=3.27)
  - There was no evidence that yoga was better than exercise on disability
- Three studies reported adverse effects which were mild to moderate; one study reported a herniated disc in one patient

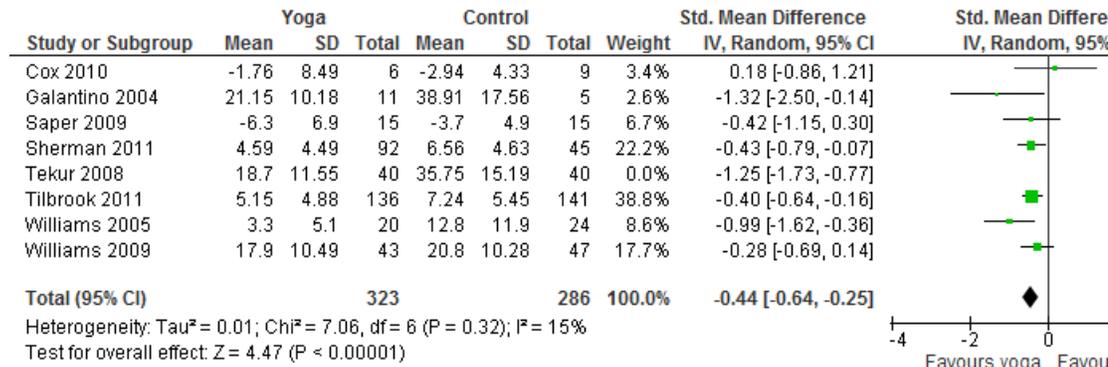
Authors’ conclusions:

- There was strong evidence in favor of yoga for short-term effects in reducing low back pain and disability
- There was moderate evidence in favor of yoga for long-term effects in reducing low back pain and disability
- Yoga was more effective than education, but there was insufficient data to show that yoga was better than usual care or exercise
- There appear to be few serious adverse effects with yoga
- There were only a few eligible RCTs, and meta-analyses could be done for only a few comparisons
- Yoga can be recommended for LBP patients who do not improve with education or self-care options

Comments:

- Overall, the process of study selection and the presentation of results are satisfactory

- The effect size classification into small, moderate, and large is sensitive to small fluctuations in the data; for example, the pooled effect size of 0.48 SD is called “small” because it is less than 0.50, but this difference is somewhat arbitrary
- The authors wanted to select studies from a wide variety of settings and cultures (most patients were female Caucasians), and this inclusiveness may account for some heterogeneity for some comparisons
  - o Figure 2, the forest plot for back-specific disability, pools results from 8 studies yielding a moderate effect size of 0.59 SD with heterogeneity of 59%
  - o One study (Tekur 2008) had a very large effect size (1.25 SD in favor of yoga over exercise), and its methodology was satisfactory for inclusion
  - o However, the Tekur study was done in India and involved interventions which are likely to be impractical in a Workers’ Compensation setting
    - The week-long yoga program began at 5:00 each morning with “Om” meditation for 30 minutes, and had later sessions of chanting verses from the Bhagavad Gita
    - If the Tekur study is removed from the analysis, the “moderate” effect of yoga becomes a “small” effect and the heterogeneity is reduced from 59% to 15%



- The two studies providing strong evidence of yoga’s superiority over education for short-term global improvement defined “education” as giving the patient a book (not as individual classroom instruction)
- Many of the meta-analyses were (as the authors note) limited by the published data available; there were 2 studies comparing yoga with usual care and 5 studies comparing yoga with educational printed material, which could account for why the authors could find strong evidence that yoga is better than simply sending the patient away with a booklet
- The comparison of yoga with exercise was based on the Tekur study (done in India) and the Sherman 2011 study (done in the United States)
  - o The Sherman study showed that yoga was better than a booklet, but not better than an exercise program in which stretching of the major muscle groups was done in a class led by a licensed physical therapist

- The Sherman study provides a more realistic comparison than the Tekur study for consideration in a Workers' Compensation setting

Assessment: Provides strong evidence that yoga has small to moderate advantages over providing only a booklet in reducing low back pain and back-specific disability, but no evidence that yoga is superior to stretching and strengthening classes led by a licensed physical therapist

#### References:

Sherman KJ, Cherkin DC, et al. A Randomized Trial Comparing Yoga, Stretching, and a Self-Care Book for Chronic Low Back Pain. *Arch Intern Med* 2011;171:2019-2026.

Tekur P, Singphow C, et al. Effect of Short-Term Intensive Yoga Program on Pain, Functional Disability, and Spinal Flexibility in Chronic Low Back Pain: A Randomized Control Study. *J Altern Complementary Med* 2008;14:637-644.