

Editorial

Yoga for Chronic Low Back Pain: New Evidence in 2011

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Chronic low back pain is a highly prevalent [1], and is typically defined as back pain lasting greater than 4 weeks [2]. In addition to pain itself, chronic low back pain also results in increased psychological symptoms [3,4], increased disability, [5] and reduced health-related quality of life (HRQOL) [6,7]. Subsequently, the health care costs of people with chronic low back pain are 60% higher than those without back pain[8], and the total economic impact (socioeconomic costs and health care costs) was an estimated \$100 billion annually as of 2008 [9].

Clinical practice guidelines for low back pain were published in 2007 [2]. The vast majority of chronic low back pain cases (85%) are not linked to specific physical abnormalities (nonspecific) [10] With non-specific low back pain, it is strongly recommended that health care providers begin treatment with patient education and the promotion of self-care activities [11]. Medication is another early option for patients with nonspecific chronic back pain [2,12]. However, opioids carry sizable risk of addiction, while continued use of non-steroidal antiinflammatory agents may produce side effects such as gastritis [13]. Non-pharmacological treatments often have fewer side effects, can be integrated into ongoing treatments, and offer alternative options for patients who do not get adequate relief from their chronic low back pain. Most non-pharmacological treatments reviewed in 2007 had small to medium effects on pain and functional limitations, but varying levels of quality and amounts of supporting evidence. Despite the varying levels of evidence, non-pharmacologic treatment options are widely recommended by primary care physicians when patients have not improved [14,15].

Yoga was one of the treatment options reviewed and at that time. Yoga was found to produce "moderate" effects on average as a treatment for chronic low back pain, and the evidence supporting yoga's effectiveness was labeled "fair". Although many early publications have not described their yoga interventions well, yoga in this case refers to Hatha Yoga. Modern Hatha yoga usually includes only a few of the eight components of the broader philosophy espoused by classical yoga [16]. The typical components found in Hatha yoga are postures or poses ('asanas'), deep and/or rhythmic breathing ('pranayama'), and to varying degrees, mindfulness or meditation (dhyana) and concentration (dharana). A typical Hatha yoga program consists of an instructor leading a group of students or practitioners through a series of yoga postures while performing deep breathing exercises for. The postures of Hatha yoga can be modified and props can be added so that it can be practiced by almost anyone, despite physical, psychological, or spiritual capabilities [16].

In May of 2011, a systematic review of randomized clinical trials of yoga in patients with low back pain was published [17]. In this review, six of the seven studies found yoga reduced pain or disability more than the comparison intervention. The only study that found no significant differences on these outcomes studied 17 patients who conducted yoga twice weekly for 6 weeks [18]. Thus, the study likely lacked statistical power and the length of the intervention was shorter most other studies reviewed.

Although the evidence from RCTs of yoga is encouraging, the 2011 review stresses the inconclusive nature of that evidence.

Limitations of the evidence for the efficacy of yoga for treating CLBP include small sample sizes in some of the studies, comparability of the yoga interventions being studied, variability in the comparison interventions, and differences in the primary and secondary health outcomes measured. These factors make cross-study comparisons a challenge.

Despite these factors, many common elements appeared to be present in all of the yoga interventions. These components included performance of yoga postures, attention to alignment of body structures, deep or rhythmic breathing, and other relaxation exercises, and specific. Comparison interventions included standard care, physical exercises, education, or no treatment. Almost all studies included outcome measures of pain and disability, while some also assessed depression. Collectively, there appears to be solid evidence that yoga produces health benefits, but more research has been needed to confirm these findings in larger randomized trials, elucidate mechanisms of change, and compare the effectiveness of yoga to other interventions.

Recent Evidence for Yoga

In late 2011, two larger randomized, controlled trials of yoga for chronic low back pain were published. In a study from England, Tilbrook et al. [19] compared yoga to usual care for chronic or recurrent low back pain among 13 general medical practices that were not part of the National Health Service. Participant outcomes were assessed at baseline, 3, 6, and 12 months. All participants (n = 313) received usual care and a back pain education booklet. The yoga intervention consisted of twelve weekly classes 75-minutes in length. Yoga participants received a student manual, a mat, a relaxation CD, and home practice logs. Yoga participants were encouraged to use the relaxation CD and to practice yoga at least 2 times per week. Yoga participants had significantly better functioning as measured by the Roland-Morris Disability Questionnaire (RMDQ) than the usual care group at all follow-up points. Although the yoga group had greater improvements in pain self-efficacy at the 3 and 6 month follow-ups, the two groups had similar levels of back pain, general health, and quality of life (SF12 physical and mental).

In the US, Sherman et al. [20] compared three interventions for addressing chronic low back. (n = 228) lives [20]. More specifically, twelve weekly 75-minute yoga classes were compared to the same

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amount of a stretching and strengthening exercise intervention. The third condition received only a back pain self-care book. The primary outcomes measures assessed at baseline and at 6, 12, and 26 weeks included the RMDQ and self-rated "bothersomeness" of back pain. Results found that yoga and conventional stretching was superior to the self-care book at all follow-up points in time. However, yoga did not produce better outcomes than conventional stretching exercises at any time points. Secondary outcomes such as self-rated improvement and satisfaction with care followed similar patterns.

These two large, randomized trials significantly improve the quality and quantity of evidence we have on the impact of yoga interventions for relieving chronic low back pain and resulting functional impairment. However, before making conclusions, it is important to consider the details and implications of these studies.

The comparison group in the Tilbrook study did not receive an active intervention, but showed clear benefits of yoga over usual care for improving daily function (reducing disability) and similar results were found in the Sherman study. These results appear to confirm similar findings from previous studies. The Sherman study also found that low back pain bothered yoga patients less self-care patients, but the Tilbrook study found no significant differences in back pain itself, and no difference in SF12 physical and mental quality of life scales. Most previous studies have found reduced pain like the Sherman study, when compared to usual care or self-care.

One possible influential factor on the lack of significant differences for pain in the Tilbrook study is that participants were drawn 13 different private practices across the UK while most other studies have drawn participants from a single health organization or region. The sampling strategy used by Tilbrook may have resulted in greater heterogeneity between cohorts and possibly greater diversity of participants than other studies, but this is hard to fully evaluate from the data published to date. It is unclear whether the clustering of the 13 cohorts was accounted for in the analysis. Like other self-rated outcomes, pain can be a challenging outcome to measure reliably [21]. Because pain can be experienced very differently across individuals and groups, the Sherman study [22] measured the "bothersomeness" of low back pain, instead of pain severity [23]. This strategy should be considered for future research.

An important aspect of the Sherman study is the "comparative effectiveness" design that directly compared yoga to a physical therapistled exercise program of stretching and strengthening with known efficacy. Exercise programs of this type are frequently recommended by health care providers, are often delivered through physical therapy clinics, and are typically covered by health care insurance. Although a non-inferiority design and analysis was not employed [24], results were very similar between yoga and the stretching/strengthening exercise group. This is interesting because a prior study by Sherman found yoga to be slightly superior to a similar but less intensive exercise program [25]. Thus, when the interventions studied have equal intensity, both produce similar results on outcomes related to function, pain, and medication usage. However, it is important to note that attendance, home practice at 26 weeks, and willingness to recommend the intervention to others were significantly higher in the yoga group than in the exercise group. This suggests that exercise interventions of this intensity are a less attractive treatment option than the yoga intervention being studied. Comparing the intensity of this exercise intervention to others currently being offered in clinical practice would be a useful research endeavor.

A possible limitation of these two important recent studies is that neither study reported the impact of yoga on depression. Depression is higher in adults with chronic low back pain depression [3,26] and many previous studies have found improvements in depression among yoga participants with [27-29] and without chronic low back pain [30,31]. It is possible that depression was measured and not reported, but depression was not specified in the manuscript describing the methods of the Sherman study [22]. The Tilbrook study results included SF-12 Mental health Component Scale but this scale is not specific to depression. Researchers should consider including measures of depression in future studies.

The recent studies also provide more complete data on the safety of yoga. Concerns have been raised, especially in the media, [32,33] that yoga could be medically harmful. However, the larger previous studies have shown very few adverse events [25,34], and the review of nonpharmacological treatments for chronic low back pain concluded that yoga rarely causes harm, but better studies and better reporting are needed [11]. In the recent RCTs, Tilbrook et al.[19] found 1 serious adverse event and 12 nonserious events among 156 yoga participants, all related to increased back pain. Sherman et al. [20] found a similar frequency of mild-moderate adverse events in the stretching and yoga interventions, with the leading cause being temporary increases in back pain. One herniated disc among the 87 yoga participants was the only serious adverse event. Thus problems can occur, but seem infrequent. For optimal safety, individuals with acute or chronic health conditions should consult their physician before initiating a yoga program.

In conclusion, two recent RCTs have made important contributions to the scientific evidence supporting yoga for chronic low back pain. They take an important step toward providing better descriptions of the interventions being applied. Among the yoga studies published to date, daily function has consistently improved across almost all studies and back pain has followed a similar trajectory. Additional research on yoga for chronic low back pain is needed on the mechanisms of yoga interventions, the costs of yoga interventions, their efficacy among various subgroups, and the impact of yoga on mental health and spirituality.

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