

Yoga for back pain: a physiotherapy perspective



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Back pain

Chronic lower back pain is a leading cause of disability and a major health problem in industrialised countries.¹ Prolonged poor posture and a sedentary lifestyle often cause chronic pain.²

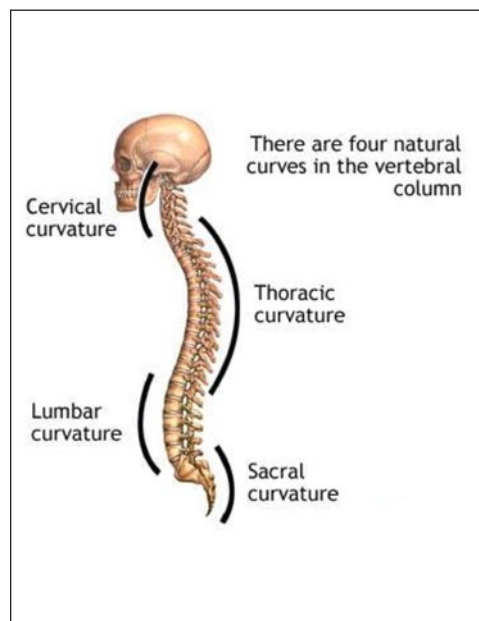


FIGURE 1: Curves of the spine.¹¹ There are four standard curves to the spine. The cervical and lumbar curvatures are concave, while the thoracic and sacral curvatures are convex.

Poor posture can lead to muscle imbalances around the flexor, extensor and rotator muscles of the back and neck. These muscle imbalances create unequal forces around and weaken the joints, thus making them more vulnerable to stress and pain.³

Currently, several noninvasive modalities used to treat chronic back pain – such as transcutaneous electrical nerve stimulation, hot packs, ice packs, medications and massage – only provide temporary relief.⁴ Braces may provide short-term external support for the back, but with prolonged use they can be detrimental, as the back muscles weaken and the spine becomes vulnerable to injury.³ Chiropractic adjustments can provide temporary relief, but unless patients can adjust their posture for lasting benefit, repeat sessions with the chiropractor are inevitable.⁵ Yoga is now emerging as a recognised means for effectively treating chronic back pain.⁴ Studies have shown a reduction in pain and functional disability in subjects with chronic lower back pain who undergo a yoga intervention.^{4,6-8} One of the first steps in practising yoga is to correct postural alignment, which should help in alleviating pain.⁶ Yoga can selectively stretch shortened, tight muscles and strengthen weak, elongated muscles.⁶ This article will discuss how yoga can be used to help correct postural alignment problems that contribute to chronic back pain.

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What is yoga?

Yoga is a practice that originated in India 5,000 years ago, and is becoming increasingly popular in Ireland and the rest of the Western world as an exercise regime.⁷ Yoga derives from Ayurveda, an ancient knowledge that aims to discover the true sense of human life and to find remedies for diseases.⁹ Yoga offers a holistic approach to health and is now considered a form of mind-body medicine within complementary and alternative medicine.⁹ Physiotherapists are beginning to recognise yoga as a form of treatment for musculoskeletal and cardiorespiratory conditions.^{6,10-16} There are several types of yoga, but the most practised one in Western societies is called hatha yoga.⁷ Hatha yoga has three main elements: the body, the mind and the breath.¹⁷ Hatha yoga aims to create inner balance between these three elements through the use of postures – called *asanas* – that are based mainly on isometric muscle contractions combined with breathing techniques – called *pranayama* – and meditation and relaxation.¹⁸ The performance of hatha yoga postures is designed to strengthen the body and increase flexibility in a manner that creates and maintains balance between opposing muscle groups.⁷ Breathing techniques, such as inhalation, exhalation and suspension, link the postures together and strengthen the respiratory muscles to improve ventilation.¹⁸ Yoga's roots lie in ancient knowledge, and thus it is not usually considered from the perspective of modern biomedical science.⁹ However, it is necessary for the physiotherapist or healthcare professional to understand the biomechanical principles behind yoga in order to know if, when and how it could be of benefit to the patient.⁹

Postural alignment

Whether sitting or standing, the spine has natural curves that should be maintained for correct postural alignment (Figure 1).³ These curves can become habitually flattened or overly curved, leading to abnormal posture that can put excessive strain on vertebrae, discs, joints, muscles or ligaments.³ Abnormal flattening or curving of the spine may be the result of prolonged poor posture while sitting or standing, such as slumping, or the result of a sudden traumatic stress, such as a road traffic accident.³ In the long term, abnormal



FIGURE 3: The Cobra.¹⁹

posture can lead to the adaptive shortening or elongation of muscles.³ Several abnormal curvatures of the spine have been documented, but the three most common are: (1) a hunched upper back – that is, excessive kyphosis – usually associated with a forward head posture; (2) an extreme sway in the lower back, called excessive lordosis; and, (3) a flat back posture.¹⁰

Yoga for excessive kyphosis

An excessive kyphotic posture (Figure 2) can develop as a result of habitual hunching over a desk or computer.⁵ It can also occur as a result of degenerative diseases, developmental problems or osteoporosis; however, these pathological deformities tend to be fixed and cannot be corrected by postural adjustment.³ A kyphotic position causes the chest to collapse, which constricts the heart, lungs and diaphragm and puts the upper and lateral fibres of the internal oblique and intercostal muscles in a shortened position.³ Kyphosis also strains the back muscles by elongating the thoracic spine extensors and the middle and lower trapezius.³ The conventional treatment for a kyphotic posture is to perform deep breathing exercises to stretch the intercostals and the upper parts of abdominal muscles, and strengthen the middle and lower aspects of the trapezius.³ An alternative treatment is to perform a hatha yoga pose called the Cobra (Figure 3) – a supported backbend that

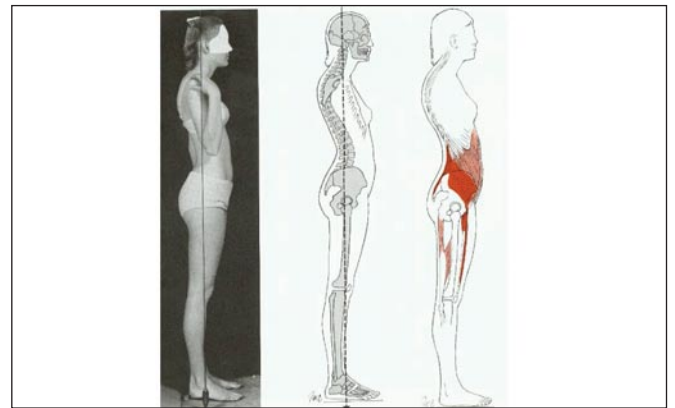


FIGURE 2: Excessive kyphosis.³

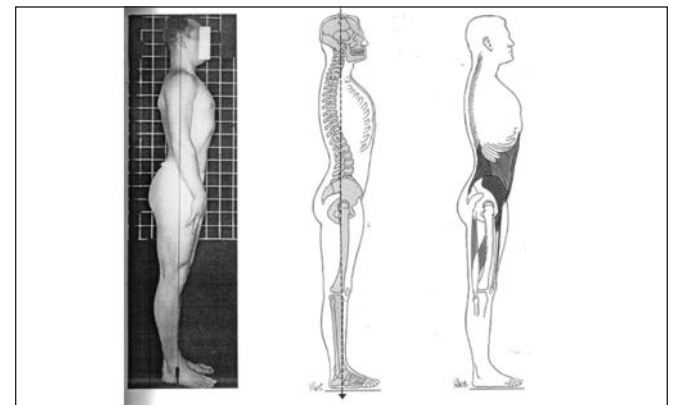


FIGURE 4: Excessive lordosis.³



FIGURE 5: Warrior I.²¹

stretches the pectoralis major and strengthens the erector spinae, the trapezius and the rhomboids.²⁰ The trapezius and the rhomboids usually maintain the position of the shoulder blades, which can fall forward towards the chest with a habitual hunched posture.³

It was found that participants who practised yoga showed clinically and statistically significant improvements in functional status, as measured by the Roland Disability score, when compared to participants who received the self-care book, but not when compared to those who performed conventional exercises.

Yoga for excessive lordosis

Excessive lordosis (Figure 4) is generally caused by a prominent anterior tilt of the pelvis.³ The pelvis is pulled into an anterior tilt by tight hip flexor muscles, including the iliopsoas, rectus femoris and tensor fascia latae, which can result from prolonged periods of sitting.³ Excessive lordosis contributes to shortening and chronic tightness in the erector spinae muscles of the lower back and to pain due to compression of the facet joints of the vertebrae.³ As a result, the abdominals and hip extensors are elongated and begin to weaken.³ To correct this posture and alleviate the pain, it is important to stretch and lengthen tight hip flexors and muscles of the lower back, along with strengthening abdominal muscles.³ This can be achieved by practicing yoga poses such as the Warrior I (Figure 5).²⁰ This pose strengthens the quadriceps and the erector spinae, stretches the iliopsoas, rectus femoris and tensor fascia latae, opens the hips and stabilises the hip joints.²⁰ Strengthening the abdominals helps to reduce the anterior tilt of the pelvis.³ The most



FIGURE 6: Boat pose.²²

common way to strengthen the abdominals is by doing crunches or sit-ups. However, these exercises primarily recruit the upper abdominals; it is the lower abdominals that are most important in supporting the lower back.³ If the upper abdominals become overly strong or tight, they may actually pull down on the rib cage and create an increased kyphosis and flattening of the normal curvature of the lower back.³ A common yoga posture used to strengthen the lower abdominals is the boat pose (Figure 6).²⁰ In this pose, the iliopsoas, rectus femoris and abdominal muscles are strengthened as they lengthen eccentrically to resist gravity.²⁰

Yoga for flat back

The hamstrings, which flex the knee and extend the hip, can become excessively tight.³ Tight hamstrings are often associated with a flat back posture.³ They pull the pelvis into a posterior tilt, which elongates the muscles of the lower back and weakens them in the long term.³ This posture can be exacerbated by overly tight or strong abdominal muscles, which pull up the front of the pubic bones and exaggerate the posterior tilt of the pelvis, and pull down the front of the rib cage, creating a forward-slumping trunk.³ A forward-slumping trunk, combined with a posteriorly tilted pelvis, puts chronic strain on the intervertebral discs and the musculature of the lower back.³ The most common method of stretching the hamstrings is to try to touch one's toes while keeping the legs as straight as possible in a seated or standing position. However, this exercise can be detrimental to the intervertebral discs, especially for someone with a flat back posture.³ In a healthy spine, weight is evenly distributed throughout each disc.³ When reaching for the toes, the lower back flexes forward, and more weight is put on the front of the intervertebral discs.³ This can potentially push the nucleus pulposus of the disc backwards and stretch the annulus fibrosis. With repetition, as in repeated forward bending or heavy lifting, the annulus fibrosis weakens and may bulge or tear, resulting in a herniated disc.³ This can be extremely painful and may require surgery.³ Although forward bends are very commonly practiced in



FIGURE 7: Forward bend.²³

hatha yoga (Figure 7), they would not be advisable for someone with a flat back posture.²⁰ An alternative yoga pose is called the Reclining Big Toe pose (Figure 8), which acts to lengthen the hamstrings without compromising the natural curves of the spine.²⁰

In a study looking at the use and perception of complementary and alternative medicine by physiotherapists in the UK and Ireland, over half of respondents reported use of alternative modalities to help alleviate back pain.

Evidence-based yoga for back pain

To date, there have not been many high-quality trials investigating the use of yoga for lower back pain. However, a seminal trial in this field was a randomised controlled trial comparing the effects of yoga to conventional exercise classes and a self-care book in patients with lower back pain.²⁵ It was found that participants who practised yoga showed clinically and statistically significant improvements in functional status, as measured by the Roland Disability score, when compared to participants who received the self-care book, but not when compared to those who performed conventional exercises. Yoga was also associated with decreased medication use in this study. "Bothersomeness" of pain, assessed by an 11-point scale, had decreased in all three groups at 12 weeks, but by 26 weeks, improvement in symptoms continued only in the yoga group.²⁵ Williams *et al.* conducted a smaller trial evaluating the effectiveness of Iyengar yoga – a popular style of hatha yoga that frequently uses physical props – in comparison to an educational control group for patients with chronic lower back pain.⁶ After 16 weeks of yoga therapy, there was a significant reduction in self-reported disability and



FIGURE 8: Reclining Big Toe pose.²⁴

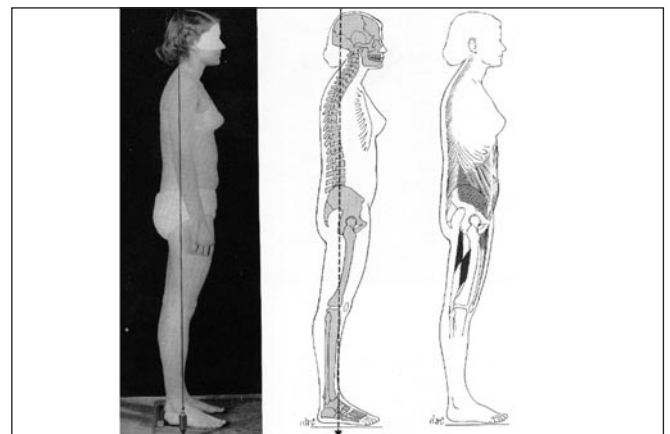


FIGURE 9: Flat back posture.³

pain and reduced medication use in the yoga study group in comparison to the control group. These findings persisted at a three-month follow-up.⁶ In a more recent study by Williams *et al.*, Iyengar yoga was compared to standard medical care for the treatment of chronic lower back pain.²⁶ Standard medical care was self-directed and the authors made no attempt to regulate treatment received; the yoga group received 24 weeks of 90-minute yoga classes twice weekly. Results demonstrated that the participants who completed the yoga intervention improved significantly in the areas of functional disability, pain intensity and depression.²⁶ Literature evaluating the use of yoga for back pain in Ireland is scant. In Ireland, the most frequently used treatments by physiotherapists for back pain are advice and exercise, followed by mobilisation techniques.²⁷ Physiotherapists most commonly prescribe home exercises, which primarily include core stabilisation exercises.²⁷ Supervision can enhance exercise adherence and treatment outcomes. However, it remains unclear why supervision is not a common component of treatment given its recognised value and support in clinical guidelines.²⁷ In a study looking at the use and perception of complementary and alternative medicine by physiotherapists in the UK

and Ireland, over half of respondents reported use of alternative modalities to help alleviate back pain.²⁸ Most respondents rated yoga as being effective for treating back pain, but only if it is chronic pain. Of the ten most common complementary and alternative medicine techniques used by patients with lower back pain, yoga was the third most common after acupuncture and massage.²⁸ These results suggest that yoga is a promising option for mobile patients whose chronic lower back pain does not respond to conventional therapies.

Conclusion

Poor posture and resulting lower back pain are becoming increasingly prevalent in today's society due to the sedentary

nature of a modern lifestyle.³ Numerous studies have found yoga to be beneficial for certain conditions.⁶⁻¹⁸

The physical postures of yoga are a form of therapeutic exercise that integrate balance, co-ordination, strength and flexibility. Yoga is emerging as a promising means of alleviating lower back pain and may be of great benefit to patients, particularly when performed in conjunction with other established treatments, such as lifestyle advice, exercise, massage and physiotherapeutic mobilisations and manipulations.⁷ Yoga, when practised in a safe and strategic manner, can be a very useful tool for the physiotherapist in treating chronic back pain.²⁷

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