

**Yoga: The Old, the New & the Evidence**

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Yoga is physical. It is stretching; it is twisting; it is flexibility; it is exercise; it is breathwork. Yoga is mental. It is control of the breath; it is meditation; it is control over the mind. Yoga is spiritual. It is the exploration of consciousness; it is looking into the soul; it is elevating. Yoga is at once old and new; it is ancient, yet contemporary.<sup>1,2</sup> Between 2002 and 2012 in the United States, there was an increase seen in complementary and alternative medicine (CAM) techniques used, including yoga, tai chi, and qi gong; yoga made up 80% of the prevalence.<sup>3</sup> In 2017, 14% of American adults practiced yoga, as did 8% of American children.<sup>5</sup> While 17.5% of people that practice yoga do so to treat a specific health condition, an overlapping 94% practice yoga for any, of many, wellness reasons.<sup>5</sup> Unfortunately, some groups, including men, Hispanics, non-Hispanic blacks, and older adults, are less likely to practice yoga.<sup>4</sup> More than 70% of people who do practice yoga said they do so because yoga is holistic, focusing on mind, body, and spirit.<sup>4,5</sup> More than 80% experienced stress reduction they attributed to their yoga practice.<sup>4,5</sup> Compared with use of natural product supplements and spinal manipulation, yoga users were more likely to exercise more regularly (63.2% of yoga users), eat healthier (42.6%), cut back or quit drinking alcohol (12.4%), and quit smoking cigarettes (25.2%).<sup>4,5</sup> Yoga is many things to many people, but overall can be viewed as a positive light and health-promoting practice in the lives' of those it touches, whether related to stress reduction, chronic disease treatment, physical function and ability, or spiritual elevation. Yoga can be summed up by one principle: "Truth is One, Paths are Many."<sup>1,6</sup>

Yoga has experienced much evolution throughout history. Yoga as practiced today, especially in the West, is more focused on physical movement, referred to as Hatha Yoga.<sup>1</sup> Traditionally though, yoga was about consciousness and controlling one's mind – the mental science; called Raja Yoga.<sup>1</sup> Two well-known historic texts, The Bhagavad Gita and The Yoga Sutras of Patanjali, focus on finding peace and attaining salvation, with little mention of physical yoga.<sup>7</sup> The Bhagavad Gita, an ancient Hindu scripture, speaks of Karma Yoga: a life of service, the path to Self-realization, a journey to find the peace of contemplation.<sup>6</sup> The Gita is an excerpt from the epic *Mahabharata*, the story of a war that took place around 1,000 BCE, historians believe; whose text was completed in the first century CE.<sup>2,6</sup> The Yoga

Sutras of Patanjali, the primary text of Raja Yoga and often referred to as “classical yoga”, are a collection of nearly 200 sutras (aphorisms or proverbs) divided into four parts: Contemplation, Practice, Accomplishments, and Absoluteness; and contain the eight limbs of yoga, spiritual guidelines for the practice.<sup>1,2,7,9,10</sup>

Even before The Gita and The Yoga Sutras though, the term yoga, translated from Sanskrit to “yoke,” as in the one placed on an animal like a horse, was seen in the Rg Veda (or Rig-Veda), one of the oldest Indian scriptures, circa 1,500-1,000 BCE.<sup>2</sup> During the pre-classical yoga era, the Vedic usage of yoga has been interpreted as “wartime,” as in the yoke on a warhorse, connected to a chariot.<sup>2,7</sup> A “celestial yoga” or divine chariot carried fallen heroes into the heavens.<sup>2,7</sup> Vedic priests described themselves as yoking their minds to chariots that would carry them toward enlightenment.<sup>7</sup> Around 300 BCE, in the Katha Upanishad, another Hindu scripture, Yama, the king of death, described what is known as the “entire yoga regimen.”<sup>2,7,8</sup> The regimen linked each individual to the universal being (Brahman) and contained a hierarchy of mind-body elements.<sup>2,7,8</sup> This early appreciation for higher levels of consciousness and the seeking of Self-realization, via the discipline of meditation, are woven into The Yoga Sutras of Patanjali, The Bhagavad Gita, and yoga as we know it today.<sup>7,8</sup>

Yoga theory and yoga practice continued to evolve over time, though the exact chronological order is sometimes debated.<sup>2,7</sup> Seekers of the true Self and those looking to end Karmic suffering grew in numbers among Hindu, Buddhist, and Jain people.<sup>2,7</sup> Mantras, most significantly the OM, were incorporated into yoga.<sup>7</sup> Yoga systems began to emerge, in The Yoga Sutras of Patanjali, believed to have been written by the fourth century CE; the scriptures from the Buddhist Yogacara school, the school beginning about two centuries before the Yoga Sutras were written; the *Visuddhimagga* of Buddhaghosa, around the fifth century; and the *Yogadrstisamuccaya* by Haribhadrāsuri, a Jain author, thought to be during the eighth century.<sup>1,2,7</sup> During Medieval times came the Tantras, during the sixth to tenth centuries CE; these Hindu and Buddhist texts focus more on self-deification rather than liberation from suffering.<sup>2,7</sup>

Tantric Yoga is split, on one side are the pure exoteric practices, while on the other side are the sexualized esoteric practices.<sup>2,7</sup> Tales of some tantric yogis told of sex, death, and dark mystical practices.<sup>7,9</sup>

Modern yoga, what we might picture today – a person in a yoga posture, controlling their breathing – appeared around the seventeenth century.<sup>2,7</sup> This modern yoga stemmed from “yoga of forceful exertion” or Hatha Yoga, made popular during post-classical yoga era.<sup>2</sup> Today, yoga is used for everything from stress reduction and cardiovascular health to improving quality of life in breast cancer patients; and from fitness and flexibility to irritable bowel syndrome (IBS) and menopausal symptoms. Yoga is also still practiced for meditative and spiritual purposes. Despite having existed for thousands of years, yoga is new to Western medicine and as such, has not been the subject of enough well-planned and well-executed studies. As is the case with many types of complementary and alternative therapies, it can be difficult to study yoga because there are so many variations.<sup>10,11,12,13</sup>

Multiple systematic reviews and meta-analyses point out that numerous yoga studies may provide low-quality evidence due to risk of bias, study design, and other methodological concerns.<sup>10,11,14,15,16</sup> Nevertheless, yoga is generally concluded to have positive effects, although sometimes no effects were reported.<sup>10,11,14,15,16,17</sup> Yoga was found to have positive results for individuals with ADHD, anxiety, asthma, back and neck pain, cardiovascular disease and related comorbidities including hypertension, breast cancer and other cancers, IBS, menopausal symptoms, COVID-19, T2DM, headaches, carpal tunnel syndrome, depression, and osteoarthritis.<sup>10,11,12,13,14,17,18,19,20,21,22,23</sup> Yoga may also be beneficial in promoting overall better mental health and physical fitness.<sup>4,10,15,16,24,25</sup>

Although rooted in spirituality, yoga has become a physical and mental health promoting activity in the United States; usually focusing on asanas, the physical postures; pranayama, the breathing techniques; dhyana, the meditation; and relaxation; cumulatively known as Hatha Yoga.<sup>4,10</sup> There are multiple styles of Hatha Yoga, including ashtanga, Bikram, kundalini, Yin, vinyasa, viniyoga, and restorative.<sup>4,10</sup> Ashtanga yoga is also called “power yoga” and is fast-paced and physically demanding; while Yin, viniyoga, and restorative yoga styles are more slow-paced and gentle.<sup>10</sup> Bikram yoga is “hot

yoga” and has been linked to adverse effects in some people.<sup>4</sup> Kundalini yoga incorporates chanting and is meant to stimulate energy and spiritual awakening.<sup>2,10</sup> Vinyasa yoga is a style that focuses on the breath while smoothly moving from one pose to the next, also called flow.<sup>26</sup> Vinyasa yoga is incorporated into both Ashtanga and Bikram yoga styles. No matter the style, temperature, or speed, yoga generally promotes deep, diaphragmatic breathing; stress reduction; and kindness towards one’s body.

The various styles and the frequency of yoga practice are often pointed out as limitations to studies, however, a thorough systematic review of 306 yoga-RCTs (randomized controlled trials) concluded there was no difference in positive or negative outcomes despite there being 52 different styles of yoga studied.<sup>12</sup> A Cochrane review of yoga for the primary prevention of cardiovascular disease (CVD) reported various styles and duration of yoga practiced, as well as short-term, small, and low-quality studies.<sup>11</sup> They concluded there was no way to examine the effect of yoga on morbidity and mortality, due to the length of trials and lack of long-term follow-ups.<sup>11</sup> They did however find that yoga had positive outcomes on diastolic blood pressure, triglycerides, and high-density lipoproteins (HDL); there was no clear effect on low-density lipoproteins (LDL).<sup>11</sup> Another review of yoga-RCTs by Bruce et al looked at 6 studies of 4,494 people and found uncertain results related to cardiac rehabilitation, despite citing previous reports of yoga improving heart health by reducing risk factors including abdominal obesity, insulin resistance, hyperlipidemia, hypertension, and heart rate variability.<sup>19</sup> Even though their review found positive and null effects, they concluded that the addition of yoga to cardiac rehabilitation programs is supported; leads to better quality of life and subjective feelings of better heart health; and may improve left ventricular systolic function for individuals who had impaired function to begin with.<sup>19</sup> Nalbant et al also reported low-quality and heterogeneity among the 33 included studies in their systemic review and meta-analysis of RCTs, but found that yoga may be effective at helping to manage hypertension, when including asana, pranayama, and dhyana, as well as relaxation, into the practice.<sup>27</sup>

Yoga is believed to promote better health outcomes related to chronic disease, as seen with CVD risk factors, as well as improve health-related fitness, including muscle strength and cardiorespiratory

fitness for individuals with type 2 diabetes mellitus (T2DM).<sup>14</sup> Again, low-quality evidence was reported and a call for more high-quality studies was made; however, Wibowo et al found that yoga could be a gentle form of exercise to help people with T2DM overcome barriers to physical activity.<sup>14</sup> In this systematic review and meta-analysis, compared to control groups of sedentary individuals, yoga had a positive effect on muscle strength, but conflicting effects on cardiorespiratory fitness, and null effects on body composition in people with T2DM.<sup>14</sup> Yoga has been shown to improve physical fitness in many other groups of people also.<sup>10,24</sup> In a meta-analysis of physical fitness in older adults (60+), yoga was found to have positive effects on balance; mobility; muscle strength; and flexibility, in the lower body, but not the upper body; and an overall positive effect on physical fitness after 9-12 weeks of practice.<sup>24</sup> In general, yoga appears to help upper and lower body muscle strength, balance, flexibility, and muscular endurance.<sup>10,14,24</sup>

Yoga may also play a role in immune system function.<sup>13,21</sup> Yoga might be beneficial by improving mindfulness and autonomic balance, reducing stress and depression, improving mood, and reducing inflammation.<sup>21</sup> In a review of yoga and its potential ability to positively increase immunomodulation and mental health in COVID-19 patients, Basu-Ray et al state that yoga could play a role in limiting cardiac and lung injury caused by the virus/disease.<sup>21</sup> They believe this is possible based on yoga's ability to increase innate immunity and inhibit the cytokine storm.<sup>21</sup> Yoga was also found to help cancer patients, as well as their family members, caregivers, and even oncology medical professionals.<sup>13</sup> Yoga may have emotional, physical, and psychological benefits for cancer patients, and meet spiritual needs not addressed by conventional medical treatments.<sup>13</sup> Beside improving quality of life in cancer patients, yoga can help specifically to reduce stress; increased stress has detrimental effects on the immune system.<sup>13</sup> Yoga is thought to prevent tumorigenesis and progression, and has been seen to regress tumor growth.<sup>13</sup> A Cochrane review of 24 studies with 2,166 women, concluded that yoga reduced sleep disturbances and fatigue, and improved quality of life (QOL) in women diagnosed with breast cancer.<sup>20</sup> They found that using yoga as a complementary therapy with standard cancer treatment could

result in improved mental health and QOL; and that when compared with some other interventions, including counseling, yoga had a greater impact on reducing fatigue, anxiety, and depression.<sup>20</sup>

Many people practice yoga for their overall well-being. The 2012 National Health Interview Survey reported that 86% of yoga users experienced reduced stress; 82% felt they had overall improved health; 67% felt better emotionally; 59% experienced better sleep; and 39% felt that yoga helped them cope with their health problems better.<sup>4</sup> Claims of therapeutic effects of yoga range from improving depression, anxiety, stress, PTSD, ADHD, and eating disorders.<sup>15</sup> When the positive mental health indicators mindfulness and resilience were evaluated, results varied, though yoga was found to be mostly beneficial, if not null.<sup>15</sup> The same systematic review stated, the indicators self-compassion, self-esteem, well-being, relaxation, and sociability were all found to be significantly improved by yoga practice.<sup>15</sup> In a systematic review of yoga and its potential to help health professionals and students in health fields, in relation to mental and physical health, Ciezar-Anderson et al found yoga to be beneficial overall.<sup>16</sup> Although they suggest that future researchers implement good study design and reporting standards due to the low-quality of current studies, they concluded that yoga can reduce stress and musculoskeletal pain, which will benefit health professionals and health students.<sup>16</sup> Cramer et al, in a systematic review and meta-analysis of RCTs, also found low-quality studies, resulting in them stating there was inconclusive evidence on yoga and anxiety disorders, despite concluding that yoga might be a safe, effective therapy for those with anxiety.<sup>25</sup>

Headaches were found to positively benefit from yoga practice in some cases, a systematic review and meta-analysis by Anheyer et al found.<sup>17</sup> Statistically significant improvements were seen in headache duration, headache frequency, and pain intensity in individuals who experienced tension headaches.<sup>17</sup> There was no statistically significant effects on migraine headaches though.<sup>17</sup> This study, like many of those mentioned previously, points out that there are multiple limitations, including a small amount of studies included and no long-term follow-ups.<sup>17</sup> In a systematic review and meta-analysis of 10 RCTs including 686 people, Li et al found that yoga may be an effective treatment for chronic nonspecific

neck pain (CNNP).<sup>22</sup> They concluded this based on decreased neck pain intensity, improved function related to neck-pain, increased cervical range of motion, and overall better mood and quality of life experienced by yoga users.<sup>22</sup> They also stated that due to heterogeneity and different outcome measurement tools, it was difficult to come to certain conclusions.<sup>22</sup>

While some studies on yoga and asthma were flawed and some showed null effects, one small yoga-RCT that included 16 weeks of pranayama, asanas, and dhyana, resulted in intervention subjects experiencing improved exercise tolerance, increased relaxation, and a better outlook, as well as decreased use of their short-acting bronchodilator inhalers.<sup>10</sup> A Cochrane review of 15 studies and 1,048 individuals also found some evidence that yoga could reduce asthma medication usage.<sup>18</sup> This review by Yang et al also concluded that yoga most likely improves quality of life and symptoms of asthma to some degree.<sup>18</sup> However, they did also note that multiple studies looked at were flawed in some way and there were inconsistent effects on lung function reported.<sup>18</sup> Yoga was found to be both safe and effective at decreasing menopausal symptoms, including psychological and vasomotor (hot flashes) symptoms, by Cramer et al in a systematic review and meta-analysis of 13 RCTs with 1,306 participants.<sup>12</sup> The effects on vasomotor symptoms were similar to those produced by interventions using other forms of exercise.<sup>12</sup> In a systematic review of yoga as an irritable bowel syndrome (IBS) therapy by Schumann et al, yoga was found to be a possible complementary treatment.<sup>23</sup> In this review of six RCTs including 273 individuals, no recommendations were made though, due to flaws in the study methods.<sup>23</sup> Regardless of study design, individuals did report decreased bowel symptoms, severity of IBS, and anxiety, as well as improved quality of life, physical function, and overall improvement after the yoga interventions.<sup>23</sup> As multiple other studies have concluded, more studies, with better study design, need to be conducted before specific recommendations can be made.<sup>23</sup>

Although often vague, these yoga-related conclusions are promising. Most articles reported no adverse effects from yoga practice, however, there sometimes are injuries and adverse events attributed to yoga.<sup>28</sup> In a 2013 systematic review of published case reports and case series, and a 2018 systematic



review of epidemiological studies, Cramer et al named headstand, shoulder stand, handstand, the lotus posture, and forward and backward bends as the postures most often related to injury, with headstand taking the lead.<sup>28,29</sup> Bikram and Pranayama yoga were the styles most often linked to adverse events in the 2013 review, while the 2018 article stated that lifelong Ashtanga yoga users claimed three times more injuries than general yoga users.<sup>28,29</sup> In the 2013 systematic review, 76 unique cases of yoga-related injury were included, mostly affecting the visual, musculoskeletal, and nervous systems.<sup>29</sup> Out of those 76 cases, more than half fully recovered, while only one case did not recover at all; and one person died.<sup>29</sup> Bikram yoga is not recommended for older adults or those with medical conditions, as the practice is intense, and in some cases has led to dehydration and hyponatremia.<sup>28,29</sup> People with glaucoma are advised not to practice inversions; those with musculoskeletal disorders should not practice forcefully or competitively.<sup>29</sup> Unfortunately, 70% of yoga-RCTs do not supply quantifiable safety data, which makes the reported 2.2% of yoga practitioners experiencing an adverse event a likely underestimation.<sup>28</sup> Despite some injuries and adverse events, often mild and transient, it is not advised that healthy people avoid yoga practice.<sup>28,29</sup> The pros far outweigh the cons when it comes to yoga practice, especially when keeping individual limitations in mind.

Yoga can not only be physically and mentally rewarding, but it can have profound spiritual effects. I first attended a yoga class almost a decade ago, but did not really get into it at that time. I returned to the studio (not the same studio) about five years ago and it affected me differently; I found myself craving the experience. The first time I tried yoga, I was not yet so engulfed by nutritional studies and was more interested in typical aerobic exercise. When I returned to yoga, I was well on my path to becoming an RD and in the process of switching my diet to entirely plant-based. I met Allison upon my return, the yoga teacher that helped to change the course of my life. She was friendly, boisterous, and knowledgeable. Her ability to teach the poses, use the Sanskrit terms, and explain the anatomy during each class had me hooked. I have always loved learning and she showed me that yoga could be my next challenge. Over the years I had so many beautiful experiences with yoga, many times shedding tears

during savasana. Yoga has allowed me to find a calmness within, where there used to be so much panic, anxiety, anger, and hostility. I still have some anxiety, but by practicing yoga I have learned to deal with it much better. I stopped going to the studio and basically let my practice lapse when the pandemic began. Almost a year later, I ended up with two herniated discs which stopped me from taking part in any physical activity for a long time. That was almost two years ago now and I am finally feeling a bit better. I practiced at a studio for the first time since the start of the pandemic this past summer and was in pain for two weeks though; I did not return. Most recently, I have been diagnosed with a hiatal hernia, which may be a blessing in disguise, because it has brought me back to yoga, just at home. I have been following a short video from Yoga with Adriene on YouTube most mornings, followed by a ten-minute meditation, and have found them to help my hiatal hernia induced GERD and stress levels this semester. I also signed up for a virtual yoga teacher training course which I am very excited about.

Yoga, once a purely spiritual practice, has morphed and adapted over time to become a mix of physically, mentally, and spiritually stimulating. There are many ways to practice, many goals to practice for, and many outcomes resulting from practice. I, for one, have found yoga to be all things, physically, mentally, and spiritually rewarding. I have learned to love it and it seems to love me back. Yoga has created a fire inside me to seek more. I want to know more about the practice, historically and in this modern era; I want to learn more about the history of yoga, Hinduism, and the scriptures; I want to explore more about myself and where yoga can take me. I always want to feel awakened, enlightened, and elevated! As yoga practice continues to reach new people, I want to bring the practice to those who might not currently find it accessible. Although the study of yoga in Western medicine is in its infancy, results and feedback so far are quite encouraging. More and more people are finding a place for yoga in their lives, and hopefully that number will continue to grow. Lesser served groups and those less likely to practice yoga, such as men, Hispanic people and non-Hispanic blacks, and older adults, deserve the chance to benefit from the possible positive outcomes of yoga. If yoga can only improve quality of life,

muscle strength, flexibility, and reduce stress, everyone should be practicing it, who is physically able, especially those with chronic diseases, stressful lives, and sedentary lifestyles.

One style of practice might not be right for everyone; some people may need a slower, gentler form of yoga, while others may thrive on intense, hot yoga. Some people may focus on the physical, some on the mental, and some on the spiritual, or some on all three. Some people may not need to focus on much, allowing whatever comes their way to do so naturally. Some people may be happy to lose themselves to practice, forgetting their troubles and their worries for a small period of time; while others may find their Self. Yoga may not be all things to all people, but it should be something to more people. Truth is One, Paths are Many.

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