

Exploring the therapeutic effects of yoga and its ability to increase quality of life

[Catherine Woodyard](#)

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INTRODUCTION

A 3,000 year old tradition, yoga, is now regarded in the Western world as a holistic approach to health and is classified by the National Institutes of Health as a form of Complementary and Alternative Medicine (CAM).[1] The word “yoga” comes from a Sanskrit root “yuj” which means union, or yoke, to join, and to direct and concentrate one's attention.[2,3] Regular practice of yoga promotes strength, endurance, flexibility and facilitates characteristics of friendliness, compassion, and greater self-control, while cultivating a sense of calmness and well-being.[4,5] Sustained practice also leads to important outcomes such as changes in life perspective, self-awareness and an improved sense of energy to live life fully and with genuine enjoyment.[6–8] The practice of

yoga produces a physiological state opposite to that of the flight-or-fight stress response and with that interruption in the stress response, a sense of balance and union between the mind and body can be achieved.[9]

Yoga is a form of mind-body fitness that involves a combination of muscular activity and an internally directed mindful focus on awareness of the self, the breath, and energy.[4] Four basic principles underlie the teachings and practices of yoga's healing system.[6] The first principle is the human body is a holistic entity comprised of various interrelated dimensions inseparable from one another and the health or illness of any one dimension affects the other dimensions. The second principle is individuals and their needs are unique and therefore must be approached in a way that acknowledges this individuality and their practice must be tailored accordingly. The third principle is yoga is self-empowering; the student is his or her own healer. Yoga engages the student in the healing process; by playing an active role in their journey toward health, the healing

comes from within, instead of from an outside source and a greater sense of autonomy is achieved. The fourth principle is that the quality and state of an individual's mind is crucial to healing. When the individual has a positive mind-state healing happens more quickly, whereas if the mind-state is negative, healing may be prolonged.

Yoga philosophy and practice were first described by Patanjali in the classic text, *Yoga Sutras*, which is widely acknowledged as the authoritative text on yoga.[2,6] Today, many people identify yoga only with asana, the physical practice of yoga, but asana is just one of the many tools used for healing the individual; only three of the 196 sutras mention asana and the remainder of the text discusses the other components of yoga including conscious breathing, meditation, lifestyle and diet changes, visualization and the use of sound, among many others.[6] In *Yoga Sutras*, Patanjali outlines an eightfold path to awareness and enlightenment called *ashtanga*, which literally means “eight limbs”. [2,10]

The eight limbs are comprised of ethical principles for living a meaningful and purposeful life; serving as a prescription for moral and ethical conduct and self-discipline, they direct attention towards one's health while acknowledging the spiritual aspects of one's nature. Any of the eight limbs may be used separately, but within yoga philosophy the physical postures and breathing exercises prepare the mind and body for meditation and spiritual development.[4,10] Based on Patanjali's eight limbs, many different yogic disciplines have been developed. Each has its own technique for preventing and treating disease.[1] In the Western world, the most common aspects of yoga practiced are the physical postures and breathing practices of Hatha yoga and meditation.[4] Hatha yoga enhances the capacity of the physical body through the use of a series of body postures, movements (asanas), and breathing techniques (pranayama). The breathing techniques of Hatha yoga focus on conscious prolongation of inhalation, breath retention, and exhalation. It is through the unification of the physical body, breath, and concentration, while performing the

postures and movements that blockages in the energy channels of the body are cleared and the body energy system becomes more balanced. Although numerous styles of Hatha yoga exist, the majority of studies included in this manuscript utilized the Iyengar style of yoga. The Iyengar method of Hatha yoga is based on the teachings of the yoga master B.K.S. Iyengar.[1] Iyengar yoga places an emphasis on standing poses to develop strength, stability, stamina, concentration and body alignment. Props are utilized to facilitate learning and to adjust poses and instruction is given on how to use yoga to ease various ailments and stressors.

Yoga is recognized as a form of mind-body medicine that integrates an individual's physical, mental and spiritual components to improve aspects of health, particularly stress related illnesses.[8] Evidence shows that stress contributes to the etiology of heart disease, cancer, and stroke as well as other chronic conditions and diseases. [11] Due to the fact that stress is implicated in numerous diseases, it is a priority to include a focus on stress

management and reduction of negative emotional states in order to reduce the burden of disease. Viewed as a holistic stress management technique, yoga is a form of CAM that produces a physiological sequence of events in the body reducing the stress response. The scientific study of yoga has increased substantially in recent years and many clinical trials have been designed to assess its therapeutic effects and benefits.

As participation rates in mind-body fitness programs such as yoga continue to increase, it is important for health care professionals to be informed about the nature of yoga and the evidence of its many therapeutic effects. Thus, this review of the literature is timely and important and provides information regarding the therapeutic effects of yoga in various populations concerning a multitude of different ailments and conditions. Therapeutic yoga is defined as the application of yoga postures and practice to the treatment of health conditions.[\[4\]](#) Yoga therapy involves instruction in yogic practices and teachings to prevent reduce or alleviate structural, physiological,

emotional and spiritual pain, suffering or limitations. Yogic practices enhance muscular strength and body flexibility, promote and improve respiratory and cardiovascular function, promote recovery from and treatment of addiction, reduce stress, anxiety, depression, and chronic pain, improve sleep patterns, and enhance overall well-being and quality of life.[[4](#),[6](#),[12](#)–[17](#)]

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METHODS

In order to locate research studies and interventions that examined the therapeutic effects of yoga, databases were searched through Google Scholar via a universities web browser. Initially, the following key words were entered into the database via the advanced search option: “yoga,” and “therapeutic effects.” This search was conducted to obtain general information regarding yoga's therapeutic effects in the existing literature. Subsequently, a second search was conducted using the following key words or exact phrases, “hatha yoga,” “therapeutic effects of yoga,” “stress,” “anxiety,” “depression,” “pain,” and “chronic

disease.” The following criteria were used for including studies in this review: (1) the article had to be peer reviewed, (2) published between the years 1990 and 2009, (3) the intervention had to incorporate some form of yoga and/ or meditation, and (4) effects of yoga on some outcome were measured.

In order to select the articles included in this manuscript, several steps were taken. First, the title was read. If the article appeared appropriate to the examination of the therapeutic effects of yoga, it was saved to a folder. The articles describing interventions that utilized yoga as a means to achieve some health outcome were chosen for further review. Each of the articles chosen were then thoroughly read and reviewed. The articles chosen include a broad spectrum of the benefits, application, and therapeutic effects of yoga.

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RESULTS

Mental health problems such as depression, anxiety, stress, and insomnia are among the most common reasons for individuals to seek treatment with complementary therapies such as yoga.[18] Yoga encourages one to relax, slow the breath and focus on the present, shifting the balance from the sympathetic nervous system and the flight-or-fight response to the parasympathetic system and the relaxation response.[5] The latter is calming and restorative; it lowers breathing and heart rate, decreases blood pressure, lowers cortisol levels, and increases blood flow to the intestines and vital organs.

One of the main goals of yoga is to achieve tranquility of the mind and create a sense of well-being, feelings of relaxation, improved self-confidence, improved efficiency, increased attentiveness, lowered irritability, and an optimistic outlook on life.[9] The practice of yoga generates balanced energy which is vital to the function of the immune system.[9] Yoga leads to an inhibition of the posterior or sympathetic area of the hypothalamus. This inhibition optimizes the body's sympathetic responses to

stressful stimuli and restores autonomic regulatory reflex mechanisms associated with stress. Yogic practices inhibit the areas responsible for fear, aggressiveness and rage, and stimulate the rewarding pleasure centers in the median forebrain and other areas leading to a state of bliss and pleasure. This inhibition results in lower anxiety, heart rate, respiratory rate, blood pressure, and cardiac output in students practicing yoga and meditation.

[[6](#),[13](#),[19](#),[20](#)]

Consistent yoga practice improves depression and can lead to significant increases in serotonin levels coupled with decreases in the levels of monamine oxidase, an enzyme that breaks down neurotransmitters and cortisol. [[5](#)] A range of therapeutic approaches is available for the management of depressive disorders, but many patients turn to complementary therapies due to the adverse effects of medication, lack of response or simply preference for the complementary approach. A number of studies demonstrate the potential beneficial effects of yoga interventions on depression, stress, and anxiety.[[18](#),[21](#),[22](#)]

Improved flexibility is one of the first and most obvious benefits of yoga.[\[5\]](#) With continued practice comes a gradual loosening of the muscles and connective tissues surrounding the bones and joints; this is thought to be one reason that yoga is associated with reduced aches and pains. Yoga helps to build muscle mass and/ or maintain muscle strength, which protects from conditions such as arthritis, osteoporosis and back pain.[\[6\]](#) During a yoga session, the joints are taken through their full range of motion, squeezing and soaking areas of cartilage not often used and bringing fresh nutrients, oxygen and blood to the area, which helps to prevent conditions like arthritis and chronic pain.[\[5\]](#) Without proper sustenance, neglected areas of cartilage will eventually wear out and expose the underlying bone. Numerous studies have shown that asana, meditation or a combination of the two reduced pain in people with arthritis, Carpel Tunnel syndrome, back pain and other chronic conditions.[\[5,6,17,23–25\]](#) Yoga also increases proprioception and improves balance.
[\[5\]](#)

Yoga increases blood flow and levels of hemoglobin and red blood cells which allows for more oxygen to reach the body cells, enhancing their function.[5] Yoga also thins the blood which can decrease the risk of heart attack and stroke, as they are often caused by blood clots. Twisting poses wring out venous blood from internal organs and allow oxygenated blood to flow in when the twist is released. Inverted poses encourage venous blood flow from the legs and pelvis back to the heart and then pumped through the lungs where it becomes freshly oxygenated. Many studies show yoga lowers the resting heart rate, increases endurance, and can improve the maximum uptake and utilization of oxygen during exercise.[13,20,26] Consistently getting the heart rate into aerobic range lowers the risk of heart attack.[5] While not all yoga is aerobic, even yoga exercises that do not increase heart rate into the aerobic range can improve cardiovascular functioning.

While yoga is not a cure for a cancer, nor a definitive way of preventing it, yoga increases physical, emotional and

spiritual wellness, and brings about a certain peace, of which many cancer patients desire.[27] Yoga, breathing exercises, and meditation can reduce stress, promote healing, and enhance quality of life for patients with cancer.[28,29] The growth of tumors and other cancer indicators are exacerbated by stress, thus it is especially important for people with cancer to reduce and manage stress effectively.[27] Several premises exist as rationale for applying yoga-based interventions with cancer patients. Research suggests that yoga can produce an invigorating effect on mental and physical energy that improves fitness and reduces fatigue.[28] Additionally, when practicing yoga, a fundamental emphasis is placed on accepting one's moment-to-moment experiences creating mindfulness and not forcing the body past its comfortable limits. Having this healthy sense of acceptance is especially important for individuals dealing with life-threatening illness as it decreases the stress one experiences from unpleasant symptomology. Initially, cancer patients likely benefit from the poses themselves which are designed to exercise each and every muscle,

nerve and gland throughout the body.[27] The postures precisely address the tension, holding, and blockage of energy in any particular joint or organ. As this tension is released, energy flows more readily throughout the body and allows patients to experience a sense of increased well-being and strength as well as a balance of mind, body and spirit.

While stimulation is good, too much taxes the nervous system and yoga provides relief from excess stimulation and the stressors and hectic nature of modern life.[5]

Restorative postures, savasana, pranayama, and meditation encourage pratyahara, a turning inward of the senses which enables downtime for the nervous system, the byproduct often being improved sleep.

Pharmacological treatment of insomnia is often associated with hazardous side effects such as states of confusion, psychomotor performance deficits, nocturnal falls, dysphoric mood, impaired intellectual functioning and daytime sleepiness, especially in older adults.[30]

Therefore, alternative forms of therapy for improving

sleep are becoming utilized more frequently. These alternative therapeutic approaches can be generally classified into three categories: behavioral based educative methods (e.g. avoiding caffeine or other stimulants before bedtime), relaxation techniques (e.g. progressive muscular relaxation, yoga, and meditation) and formal psychotherapy. Because of its ability to increase relaxation and induce a balanced mental state, yoga has been studied to evaluate its possible effects on sleep and insomnia.[[16](#),[30](#)]

In summary, stress has a negative impact on the immune system and prolonged exposure increases susceptibility to disease and leads to physical and mental health problems such as anxiety and depression.[[9](#),[19](#)] Practicing yoga and meditation as a means to manage and relieve both acute and chronic stress helps individuals overcome other comorbidities associated with diseases and leads to increased quality of life.[[14](#),[31](#)] As a non-pharmacological form of treatment, yoga based interventions are an alternative option for the treatment of

mood disorders. Further investigation of yoga as a therapeutic intervention in depressive disorders is needed and future studies should seek to identify which of the yoga-based interventions is most effective and what levels of severity of depression are more likely to respond to this approach.

In addition to the effects of yoga on mood disorders and stress reduction, yogic practices are shown to improve cardiorespiratory performance, psychological profile, and plasma melatonin levels and also significantly reduced systolic blood pressure, diastolic blood pressure, mean arterial pressure, and orthostatic tolerance.[[16,26](#)]

Furthermore, yoga helps to improve the cardiovascular efficiency and homeostatic control of the body and results in improvements in autonomic balance, respiratory performance, and overall well-being. Yoga based lifestyle modifications were also shown to aid in regression of coronary lesions as well as to improve myocardial perfusion in patients with CAD.[[32](#)] Inevitably, cardiovascular parameters alter as one ages, but these age-

related deteriorations in cardiovascular functions are slower in persons who practice yoga regularly as yoga practitioners had lower heart rate as well as lower systolic and diastolic blood pressure than matched controls.[[13](#)]

Numerous studies show that asana, meditation or a combination of the two can reduce pain and disability while improving flexibility and functional mobility in people with a number of conditions causing chronic pain. [[5,6,17,23–25](#)] Additionally, in some cases use of pain medication was reduced or eliminated completely. Yoga was also shown to improve gait function and reduce age-related changes in gait among a group of healthy, non-obese elders.[[33](#)]

Regarding yoga's effects for cancer patients, results show a decrease in post-chemotherapy-induced nausea frequency, nausea intensity, intensity of anticipatory nausea, and anticipatory vomiting.[[29](#)] Additionally, yoga subjects reported decreased anxiety, depression, and distressful symptoms and also showed significantly

reduced toxicity scores compared to the controls. Results from another study showed patients experienced significantly lower levels of pain and fatigue, and higher levels of invigoration, acceptance and relaxation following participation in a yoga intervention.[28] Yoga, breathing exercises, and meditation can reduce stress, promote healing, increase energy, decrease adverse treatment effects, and enhance quality-of-life for patients with cancer.[28,29]

Yoga's ability to increase relaxation and induce a balanced mental state was studied to evaluate its effect on sleep quality and improving insomnia. Regular practice of yoga resulted in a significant decrease in the time taken to fall asleep, an increase in the total number of hours slept, and in the feeling of being rested in the morning.[30]

Additionally, yoga had a positive influence on sleep patterns in individuals with lymphoma.[16] Furthermore, participation in yoga classes improved self-reported quality-of-life as well as measures of physical function among an elderly population.[14]

According to Buddhist philosophy the roots of addiction are in the mind and the practice of mindful meditation encourages addicts to accept the basic impermanence of human experience and helps them to develop a detached awareness of thoughts.[12] Yoga and meditation practices exert positive influence on addictive behaviors. Through the practice of yoga, addicts shift from self-inflicted harm and disrespect toward their bodies to more respectful, caring, and loving behaviors. Eating disorders are a specific type of addiction and yoga appears to be beneficial in improving body image disturbances and useful in the recovery from eating disorders.[34] One study found that female yoga practitioners attribute their positive feelings and sense of well-being to yoga practice and report less self-objectification, greater satisfaction with physical appearance and fewer disordered eating attitudes compared to non-yoga practitioners.[35]

The findings of the aforementioned studies examining the psychological and physical outcomes of yoga prove difficult to summarize and draw concrete conclusions due

to variation in the research designs, differences in the duration and frequency of yoga classes, and differences in the specific yoga programs and populations being studied. Nonetheless, results for the included studies demonstrate many of the numerous therapeutic effects, benefits and profound healing power of yoga.

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DISCUSSION

Rapidly emerging in the Western world as a discipline for integrating the mind and body into union and harmony, when adopted as a way of life, yoga improves physical, mental, intellectual and spiritual health. Yoga offers an effective method of managing and reducing stress, anxiety and depression and numerous studies demonstrate the efficacy of yoga on mood related disorders.

Currently, treatment for anxiety and depression involves mostly psychological and pharmacological interventions; however, mind-body interventions are becoming increasingly popular as a means to reduce stress in

individuals. Yoga, a form of mind-body exercise, has become an increasingly widespread therapy used to maintain wellness, and alleviate a range of health problems and ailments. Yoga should be considered as a complementary therapy or alternative method for medical therapy in the treatment of stress, anxiety, depression, and other mood disorders as it has been shown to create a greater sense of well-being, increase feelings of relaxation, improve self-confidence and body image, improve efficiency, better interpersonal relationships, increase attentiveness, lower irritability, and encourage an optimistic outlook on life.

Researchers are only beginning to understand how disciplines such as yoga promote personal growth, health and well-being. By acknowledging the unity of mind, body and spirit, mind-body fitness programs (i.e. yoga) can assist people in their pursuit of peace, calmness, and greater wholeness and integration in their lives. Health care professionals, health educators and the like, need to

be aware of the potential of yoga as an important component of a personal wellness plan.

While no concrete guidelines exist regarding the frequency of practice, the more you practice the more you benefit. Yoga is a personalized practice and as such, frequency and duration are personal questions with individual answers. Practice should happen with wisdom and should be modified to meet individual needs and goals. Individuals should practice as often as possible, especially in the beginning. The length of the induction phase will vary depending on an individual's initial level of fitness and health status; the more difficult yoga is for someone in the beginning the more their body needs it.

While modern medicine has the ability in many cases to heal physical diseases and alleviate psychological disorders, it is argued that a purely medical approach is far less effective in healing the emotional, intellectual, and personality layers of the human entity. The discipline of yoga offers individuals a timeless and holistic model of

health and healing and although it may not result in the complete elimination of physical diseases and/ or adverse conditions from the body it offers a holistic path of healing. There exists an indisputable connection between a person's overall physical and mental health and the inner peace and well-being yoga is designed to achieve. Yoga suspends the fluctuations of the mind and by acting consciously, we live better and suffer less.