

## **Technology for Inner Management and Wellbeing-Yoga: Review of Literature**

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### **Abstract**

The word yoga, is understood by many as a practice related to particular geographic and religious identity. Yoga means union, and it is a technology developed for enhancing the different aspects of life and management of this technology, will help everyone experience enhanced health and well-being. By undertaking a review of literature, an attempt is made here to understand the benefits of yoga in different health/ailment conditions. This review will facilitate the emerging areas, focus areas and thrust areas related to research on yogic science and will also facilitate in understanding the thrust areas. The gaps identified at the end of this paper will facilitate in knowing the opportunities available for future aspirants in yogic science research.

**Keywords:** Yoga, health, well-being, technology, alternative therapy.

## **Introduction: What is Yoga?**

The word “yoga” means union. Union means, one begin to experience the universality of who they are. Yoga is not a religion, but, a science. Yoga has nothing to do with any particular religion; it is a science for inner wellbeing. This yogic science is getting utmost importance now, like never before. With modern science and technology, humanity today possess huge power in hands, at the same time, it is of vitally important to understand, that, everyone have an inner sense, an awareness of life and that we experience life and everyone as part of ourselves.

As there are physical sciences to create external wellbeing, yoga is the science for inner wellbeing.

Yoga can be transmitted on many different levels. Can be transmitted towards one’s physical and mental wellbeing which includes health and other aspects, can be transmitted as a tool for ultimate wellbeing, where one can use this system as a stepping stone to go beyond, can use yoga to get rid of backache/ailments and become healthy or one can use yoga to get better mental focus, peace of mind and happiness in life, and above all one can use yoga as a way of climbing up to the highest possibility within themselves. Increasingly, yoga is used for health and wellbeing only in today’s world. But it can also be used as a tool for understanding and approaching the unknown dimensions of the divine (Vasudev, 2011).

Yoga is regarded as a form of mind-body medicine and part of Complementary and Alternative Medicine. (Shannahoff-Khalsa, 2004). It has been suggested that yoga creates inner, physical and emotional balance through the use of postures, combined with breathing techniques. Yoga has diverse clinical and nonclinical applications as a result of the degree of complexity and multidimensionality. Yoga is rooted in Indian philosophy and has been a part of traditional Indian spiritual practice for millennia. (Iyengar, 1966). It is a well-documented fact that Sage Patañjali is considered as the father of yoga. He is a sage, a scientist and an alchemist and prescribed adherence to eight limbs of yoga, aimed at quieting one’s mind to achieve the union of mind, body and spirit that is traditional yoga’s ultimate goal. These limbs include ‘Yama’ and ‘Niyama’ (a code of conduct for an ethical lifestyle), ‘Asana’ (physical postures), ‘Pranayama’ (breath control), ‘Pratyahara’ (withdrawal of the senses from external objects to increase self-awareness), ‘Dharana’ (concentration), ‘Dhyana’ (meditation) and ‘Samadhi’ (oneness with the object of meditation) (Feuerstein, 1998)

Regardless of its spiritual origins, yoga has become a popular route to physical and mental well-being and has been widely adapted for use in complementary and alternative medicine in Eastern society and recently in Western society. Yoga is most often associated with physical postures, breath control and meditation. Worldwide, it is estimated that yoga is regularly practiced by about 30 million people (Dangerfield, 2009). Yoga is gaining increased popularity as a therapeutic practice. Nearly 14 million Americans (6.1% of the United States of America's population) reported that yoga had been recommended to them by a physician or therapist (Macy, 2008). About half of American yoga practitioners (more than 13 million people) reported starting practice explicitly to improve their health (Barnes et al 2007).

With this backdrop, this study intends to overcome some of the conventional thoughts and stereotypes associated with yoga. A thorough and detailed review of literature has been undertaken. Research papers related to different forms and different styles of yoga are taken. The research papers are taken from popular databases like PubMed, Medline, and Elsevier and google scholar. This review helped the authors to identify the benefits achieved through yoga in different conditions and also the gaps in the existing literatures.

### **Is yoga a religious practice?**

Because yoga as a science evolved and was developed in Indian culture, in the land of Indus—the civilization which grew on the banks of river Indus— was identified as Hindu. Slowly, people have started identifying yoga as Hindu. Yoga is a science and a technology. It is not a teaching, not a philosophy, not a religion, not a belief system, but a technology. A technology beyond any religion. But, as it is a subjective technology and evolved from one particular geographical area-India, it is being referred to as Hindu in many parts of the world, which is also fading away (Vasudev, 2011).

### **Why research on Yoga?**

The research on yoga or yogic science is emerging, but at a very slow pace. Most studies were small and badly designed or suffers from self-selection bias. The many different styles of yoga also makes tough to understand the meaningful evidence about one style with that of the others. There are no long term studies on mortality or serious disease incidences with adequate evidence. When compared with other forms of exercise like tai chi or meditation, yogic science

research and documentation is still poor and inadequate. Researches across the world is not yet able to identify the reason in a scientific way. (Irwin, 2015)

Studying yoga is not straight but tricky, as researchers believe blinded studies are the highest quality of research, because participants involved do not know the interventions (medicine/ drugs/others) they are receiving and their biases and perceptions do not come in the outcomes. As defining yoga often becomes an issue, as yoga usually involves some combination of the following like: postures; and poses (asanas), regulated breathing (pranayama), and meditation and relaxation (samyana). But many styles mixes other elements like chanting, heating, music, etc.

To reduce inflammations with aerobic exercises, one needs to maintain vigorous levels. But with yoga even practices with minimum levels of physical activity like stretches is having large size effects. (Irwin, 2015). Researchers are yet to find out the reasons why yoga helps in back pain. The Cochrane Review Protocol offered some guesses, suggesting the improved flexibility and muscle strength, and relaxation and body awareness are the probable reasons. Western-style analytic techniques which follows a control trial design are yet to identify the benefits of yoga in stimulating digestion and wringing out toxins with only particular poses (asanas) or breathing techniques for particular outcomes.

### **Key studies on Yoga**

Lancet 1975-“Randomized controlled trial (RCT) of yoga and bio feedback in management of hypertension”. This is the first randomized trial on yoga, and found that yoga was more effective than relaxation in reducing high blood pressure

British Medical Journal 1985- “Yoga for bronchial asthma: A controlled Study”. This is the first randomized trial on yoga for asthma, and it was one of the first to show the effects of yoga on the inner organs

JAMA 1998-“Yoga-based intervention for carpal tunnel syndrome”. This was a well-regarded randomized trial that showed the benefits of yoga for carpal tunnel syndrome compared with wrist splinting and no intentions.

Annals of Internal Medicine 2005- “Comparing yoga, exercise, and a self-care book for chronic low back pain”. This is the most important trial on yoga for lower back pain and the first high-quality trial on yoga. Based on this trial, yoga had become increasingly recognized as an effective treatment for chronic lower back pain

Journal of the American College of Cardiology 2013-“Effect of yoga on arrhythmia burden anxiety, depression, and quality of life in paroxysmal atrial fibrillation”. One of the first trials to show that yoga may have an Impact on life-threatening diseases such as atrial fibrillation.

Journal of Strength and Conditioning Research 2013-“Bikram Yoga Training and Physical Fitness in Healthy Young Adults”. This trial showed Bikram yoga can improve strength and flexibility but not aerobic capacity.

Journal of Clinical Oncology 2014-“Randomized, controlled trial of yoga in women with breast cancer undergoing radiotherapy”. This high-quality trial demonstrated yoga can have benefits for women being treated for breast cancer.

Brain, Behaviour, and Immunity 2015-“Mind-body therapies and control of inflammatory biology”. A review of the evidence on yoga and other mind-body activities and their relationship to reducing inflammation.

## **Review of Literature**

Karen et al (2005) undertook a randomized controlled trial to find the effective treatment for chronic low back pain. The objective of their study was to identify whether yoga is more effective than conventional therapeutic exercise or a self-care book for patients with chronic low back pain. 101 adult patients with chronic low back pain were examined for the study. Their intervention includes 12 week sessions of yoga or conventional therapeutic exercise class or a self-care book. Primary outcome were back-related functional status (modified 24-point Roland Disability Scale) and bother-someness of pain (11-point numerical scale). The primary time point was 12 weeks. Clinically significant change was considered to be 2.5 points on the functional status scale and 1.5 points on the bothersome scale. Secondary outcomes were days of

restricted activity, general health status and medication use. Results of this study indicates that after adjustment for baseline values, back-related function in the yoga group was superior to the book and exercise groups at 12 weeks. At 26 weeks, back-related function in the yoga group was superior to the book group. Results suggest that yoga is an effective treatment for chronic low back pain. The study concluded that yoga was more effective than self-care book for improving function and reducing chronic low back pain, and the benefits persisted for at least several months. This study further suggests that viniyoga (a style of yoga) is a safe and effective treatment for chronic back pain and provides physicians with a rationale for recommending it to their patients.

Brown & Gerbarg (2005) intended to find the associations between emotional disorders and vagal tone as indicated by heart rate variability. A neurophysiologic model of yogic breathing was proposed. Yogic breathing is a unique method for balancing the autonomic nervous system and influencing psychologic and stress-related disorders. Many studies demonstrate effects of yogic breathing on brain functioning and physiologic parameters, but the mechanisms have not been clarified. Researchers used Sudarshan Kriya Yoga (SKY), a sequence of specific breathing techniques which includes Ujjayi, Bhastrika and Sudarshan Kriya, which can alleviate anxiety, depression, everyday stress, post-traumatic stress and stress-related medical illnesses. This mechanism contributes to a state of calm alertness including increased parasympathetic drive, calming of stress response systems, neuroendocrine release of hormones and thalamic generators. This model has heuristic value, research implications and clinical applications. Kumar et al (2016) undertook a scientific quasi experimental study to investigate the effects of Isha Hatha Yoga on core stability and standing balance in healthy persons. The study was undertaken on volunteers registered for 21 days Isha Hatha Yoga training programme, which includes Upa Yoga, Surya Kriya, Angamardhana, Bhuta Suddhi and Asanas. The study was undertaken in Isha Yoga Centre at Isha Foundation in Coimbatore, India. Single-leg stroke test scores and plant test scores before and after the programme were studied. Significant increase was observed in standing stroke test on right and left sides in plank test. The study concluded that healthy volunteers who underwent this 21 days training programme in Isha Hatha Yoga showed significant improvements in core strength and balance.

Telles et al (2010) identified that a weeks practice; of yoga helps people to overcome stress. Due to heavy rain and a rift on the banks of the Kosi River, in the state of Bihar in north India, there were floods with loss of life and property. A week of yoga practice was given to the survivors a month after the event and the effect was assessed. Twenty-two volunteers (group average age  $\pm$  S.D,  $31.5 \pm 7.5$  years; all of them were males) were randomly assigned to two groups, yoga and a non-yoga wait-list control group. The yoga group practiced yoga for an hour daily while the control group continued with their routine activities. Both groups' heart rate variability, breath rate, and four symptoms of emotional distress using visual analog scales, were assessed on the first and eighth day of the program. Results; of ;the study indicates that, there was a significant decrease in sadness in the yoga group ( $p < 0.05$ , paired t-test, post data compared to pre) and an increase in anxiety in the control group ( $p < 0.05$ , paired t-test, post data compared to pre). The study further concludes that, a week of yoga can reduce feelings of sadness and possibly prevent an increase in anxiety in flood survivors a month after the calamity

Streeter et al (2012) explains the benefits of yoga practices in diverse, frequently comorbid medical conditions based on the concept that yoga practices reduce allostatic load in stress response systems such that optimal homeostasis is restored. As per the proposed theory hypothesized by the authors of this study, the decreased PNS (parasympathetic nervous system) and GABAergic ( gamma amino-butyrac acid) activity that underlies stress-related disorders can be corrected by yoga practices resulting in amelioration of disease symptoms. This has far-reaching implications for the integration of yoga-based practices in the treatment of a broad array of disorders exacerbated by stress.

Khalsa (2004) made bibliometric analysis on the biomedical journal, literature involving research on clinical application of yoga. His analysis revealed that, there is an increase in publication frequency in clinical applications of yoga involving RTC and controlled trials. Further, the analysis also indicated that yoga as a therapy is relatively novel and emerging as a clinical discipline within the broad category of mind-body medicine. Majority of studies are conducted in Indian investigators and published in Indian journals, but, in recent times, increasing contributions are emerging from United States and England.

Dayananda et al (2014) undertook a survey to study the factors influencing adherence to yoga practices on those participants who have completed 1-month Yoga Instructors' course from a yoga university. Online survey was conducted on participants using Survey Monkey web portal with response rate of 42.5%. A total of 1355 participants were approached. Demographic items and a checklist of 21 items on a 5-point Likert scale were prepared based on traditional yoga texts. A few items to assess modern lifestyle barriers were also included. One-sample proportion test with chi square statistics was used for analysis. Results of the study indicates that Irregularity in lifestyle, family commitments, and occupational commitments are perceived as significant strong barriers. Dullness, excessive talking, strictly adhering to rules, laziness, physical and mental overexertion, fickleness and wandering of mind, unsteadiness of mind, procrastination, and oversleeping are considered as significant barriers of moderate nature. This study concluded that modern lifestyle is the major challenge for yoga practitioners to adhere to regular practice of yoga. To address this, attention is required in strengthening the lifestyle management and the spiritual dimension of yoga practice as the spiritual component seems to be side-tracked.

Battle et al (2015) developed a treatment development study to evaluate whether prenatal yoga could represent a viable treatment option for antenatal depression, with a 10-week prenatal yoga program for depressed women with no prior yoga experience. Authors tested the intervention in an open pilot trial with 34 women and found that the intervention was feasible to administer and acceptable to both patients, who voiced high levels of satisfaction, and to prenatal care providers, who welcomed study recruitment and provided medical clearance for appropriate patients. Authors designed the program to be consistent with prenatal yoga classes offered in the community. Women engaged in the program by attending classes and practicing yoga at home. Classes were gentle in nature and no injuries or safety concerns were reported. Significant reductions in depression severity were observed from pre to post treatment. Researchers also collected data on a potential mechanism of change, mindfulness, observed that mindfulness was correlated with depression at baseline, and that there were increases in mindfulness over time as women participated in the trial. These findings contribute to the small but growing literature suggesting that prenatal yoga may be useful as a treatment for antenatal depression.

Sreedevi et al (2017) studied two low cost interventions-yoga and peer support on glycemetic and other outcomes among women with type two diabetes in Kerala, India. Kerala leads India in terms of the number of people with Diabetes. The authors looked at low cost interventions that can empower patients and build on available resources to help manage diabetes among women. Block randomization with a block length of six was carried out with each group having at least 41 women. Yoga session consisting of a group of postures coordinated with breathing were conducted for an hour, two days a week. Results of the study indicates that there was a decline of fasting plasma glucose in the peer and yoga group and glycosylated hemoglobin. Significant decrease was observed in diastolic blood pressure and hip circumference in yoga group. Effect of yoga and peer support on glycemetic outcomes was incremental.

### **Gaps and Discussions**

The above review help the researchers to have a look at the existing studies on yoga, even though the number of studies reviewed are considerably less. Authors found that the available research evidence has continuously increased with time, but more research is clearly needed. In most of the randomized control trials, ailments like breast cancer, asthma, and depression are the most commonly-studied conditions. Despite the fact that many of these studies have found positive effects, yoga research clearly remains limited for most other conditions. Besides primary research, up-to-date systematic reviews and meta-analyses are needed for the most commonly studied conditions in order to evaluate the level of evidence and strength of recommendation for or against the use of yoga in each condition.

Several studies now suggest that prenatal yoga may be a viable treatment for antenatal depression, likely to be safe, feasible to administer, and acceptable to women and providers. However, critical questions remain unresolved. In addition to a well-designed, fully powered RCT to evaluate efficacy, future studies should examine potential mechanisms of action. Mechanisms may be conceptualized on the biologic level (e.g., decreased sympathetic nervous system arousal) and on the psychological level (e.g., increased mindfulness/ non-judgment). Further, future studies should include longitudinal designs, and evaluate not only maternal outcomes, but also associated pregnancy and infant outcomes. Prior studies with healthy, non-

depressed samples suggest that yoga may improve overall maternal health and wellbeing, as it is associated with lower lumbo-pelvic pain, better quality of life lower stress and decreased delivery pain. In addition, women with high risk pregnancies who practiced yoga are less likely to develop pregnancy-induced hypertension or pre-eclampsia and had fewer preterm births. However, no studies to date have evaluated pregnancy and birth outcomes among depressed women practicing yoga.

While most trials included yoga postures and breathing, yoga meditation and philosophy in its totality were less often used. Yoga is, by definition, a multimodal practice. Although physical exercise is now often seen as yoga's main component in Western society, meditation, breathing and lifestyle advice are all traditionally advocated to be at least equally important. In identifying yoga's effectiveness, it is important to note that studied interventions can range from the purely meditative to the purely physical in nature. In such cases, the effects of diverse interventions are hardly directly comparable, making research to determine the best balance for different medical conditions valuable. Yoga is not a standardized intervention. This diversity makes it challenging to convey the nature of 'best' practice for inclusion in medical guidelines or patient recommendations. Guidelines for designing yoga interventions and control conditions in clinical trials will increase the homogeneity of future research.

The above evidence suggests that future research might usefully explore the separate effects of yoga postures, breath control, meditation and lifestyle advice, to determine the best interventions for different medical conditions. Such researches will also convey the message that yoga is a science and it is a technology, the meticulous learning, practice and adoption of this wonderful tool will not only enhance health and wellbeing, but, it ultimately facilitates individuals and communities to understand the concept of oneness, resulting in union and aligning with the ultimate.

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