

## Short Communication

# 8 Evidence Based Health Benefits in Long Term Yoga Practitioners

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## Introduction

Mountains of studies have shown the health benefits of short-term yoga interventions. But what happens if someone continues practising consistently for many years? Scientific findings report the accumulation of both physical and psychological changes. Great news for yogis!

## Yoga Slows Spinal Segeneration

An interesting study was done in Taiwan to see whether yoga practice was beneficial to the spine. The study which compared degenerative disc disease in spines of long-term yoga practitioners (13–20 years of practice) with controls who never did yoga. All 36 subjects were matched for age, gender, BMI, health markers, were non-smokers, etc. The study used magnetic resonance imaging to see the condition of the lumbar and cervical spine.

The overall disc scores of the yoga group were significantly lower (indicating less degenerative disc disease) than the controls.

The authors note that “it is possible, although speculative, that the various positions held by the spine during the yoga sessions retard disc degeneration by increasing the ability of nutrients to diffuse into the disc. It is also possible that the tension and compression of the disc during yoga exercises stimulate the synthesis of growth factors ...residing in the disc and prevent senescence”.

Although this was a small study, it was well-controlled and all images were assessed in a blinded fashion, the two authors, both experienced in reading spinal MRI, did not know to which group each image belonged.

## Yoga Helps Manage Stress

A recent Indian study found that long-term yoga practitioners were better able to manage their stress, and also perceived having higher personal control, lower emotional impact, lower risk and higher preventive control for contracting COVID19 than matched non-practitioners [2]. Those who had practised for a longer period of time were found to have highest peace of mind, and the lowest depression and anxiety.

We see the calming effects of yoga at a physiological level. When we are stressed, the brain activates the sympathetic nervous system which in turn signals the release of hormones such as cortisol into the bloodstream.

GABA (brain gamma aminobutyric acid), the primary inhibiting neurotransmitter (chemical messenger) acts like a gate keeper for stress hormones. When a threat - or the thought of the threat - passes, the parasympathetic nervous system dampens the stress response and GABA increases.

A study carried out at the Boston University School of Medicine, compared changes in GABA levels in healthy, regular yoga practitioners before and after a 60-minute yoga session, with matched controls (who had no yoga experience) who read popular fiction for 60 minutes [3].

The GABA levels of the groups were measured immediately prior to and immediately after the interventions. The yoga session was associated with a 27% increase in GABA levels. In contrast, no change was seen in the controls.

## Yoga Can Change Your Brain!

Scientists have known for decades that aerobic exercise, and more recently, meditation, strengthen the brain and contribute to the growth of new neurons. And now it looks like yoga can be added to this list.

Using MRI scans, researchers in Maryland detected more grey matter in certain brain areas in 14 people who regularly practiced yoga (on average for 6 years), as compared with 14 control subjects who had never done yoga [4]. The yogis and controls were matched on age, sex, education and physical activity levels.

Grey matter is responsible for many of the brain's functions, including learning skills and memory, interpreting senses, muscle control and self-awareness.

The Maryland group found that yogis who practised asana, breath techniques and meditation had more grey matter in the somatosensory cortex, (which contains a mental map of our body), the superior parietal cortex, (involved in directing attention), the hippocampus, (vital for memory) and other areas key to our concept of self, compared to the controls.

Importantly, the more years of yoga and more hours practised per week, the better the grey matter preservation. Of course, we might ask ourselves, is it possible that the yogis had more grey matter than the controls before they ever hit the mat?

The answer may lie in a review which focused on the relationship between yoga practice and brain health [5]. The studies measured brain differences between individuals who regularly practised yoga (average of 9.3 years of experience) and those who didn't.

The amygdala (a brain structure that contributes to emotional regulation) and hippocampus tend to be larger in yoga practitioners than in their peers who do not practise yoga. The prefrontal cortex (a brain region just behind the forehead, essential to planning, decision-making, multi-tasking), and cingulate cortex (implicated in complex cognitive functions, such as empathy, impulse control, and decision-making) also tend to be larger or more efficient in those who regularly practise yoga.

We have to question if it is the yoga practise or the yoga lifestyle that helps our brains. A national survey in the USA found that, compared to the US average, yoga practitioners are more likely to be physically active, non-obese, and well-educated – each of which are known to individually contribute to positive changes in brain structure and function [6]. The survey also found the yoga practitioners are almost four times more likely to follow vegetarian or plant-based diets compared to the US population, which could also contribute to brain health.

In summary, the news is that consistent, sustained yoga practice may change the brain for the better.

## Yoga can Increase Immunity

Studies at Ohio University College of Medicine suggest those who have practised yoga for a long time have better inflammation markers and immunity than those who have not.

In a randomized control trial, researchers found that 25 experienced yoga practitioners (who had practised yoga regularly for more than 2 years) recovered better from stress than 25 novices [7].

Emotional and physical stressors activate immune pathways that enhance pro-inflammatory cytokine production. The experimenters put all their subjects in a stressful situation (including mental arithmetic tasks and dipping body parts in icy cold water - which may cause stress to many!) and then compared their inflammatory and endocrine (hormonal) responses.

Even though the participants were matched on age, fitness, and various health dimensions, the novices' pro-inflammatory cytokines were 41% higher than those of the experienced practitioner's in response to the stressors.

A Norwegian study found that even after a single yoga practice, experienced yogis were found to have improved gene expression, particularly in immune cells, immediately after the practice [8]. This suggests that yoga, breathing practices and meditation result in rapid gene-expression alterations which may form the biological basis for long-term positive health effects of regular practice.

**Bottom line:** Science says that yoga can have positive effects on immunity in healthy people.

## Yoga Helps Improve Respiratory Function

Regular yoga practice which incorporates pranayama improves respiratory function in healthy individuals. And the more pranayama one does, the greater the improvements.

A review carried out by researchers at RMIT in Australia found that regular yoga practitioners use less O<sub>2</sub> in daily life than matched controls who don't practice yoga [9]. Decreased oxygen consumption at rest is an indicator of cardio-respiratory system fitness and efficiency.

Conversely, increased oxygen consumption when doing exercise indicates that the body's aerobic function is healthy. When bhastrika breathing was performed at a rate of 232 breath/min by 3 advanced practitioners, O<sub>2</sub> consumption increased by 208% [10]. Other pranayama techniques also generated these benefits with ujjayi increasing O<sub>2</sub> consumption by up to 52% [11]. This shows that these types of pranayama, like traditional aerobic exercise such as running, burn a lot of calories (therefore consuming a lot of O<sub>2</sub>) while they are actually being performed, even though this leads to lower O<sub>2</sub> consumption at rest due to the improved efficiency and fitness of the respiratory system gained from the practice.

Experienced yoga practitioners have been shown to have a higher tidal volume (the amount of air a person inhales during a normal breath) at rest and to be better able to cope with hypercapnia (too much CO<sub>2</sub> in the blood) than matched controls with similar physical activity levels who do not practise yoga [12].

Given that some experiments indicate that the lower your O<sub>2</sub> consumption at rest, the longer you live [13], you might want to hit the mat and start doing some pranayama right now!

## Improves Body Image, especially if you are doing Yoga Because You like It

Studies have noted that the more frequently one practices yoga and the more lifetime practice one has done, the lower the tendency to self-objectify and the happier they tend to be with their body image [14].

A cross-sectional questionnaire study carried out in Hungary on 203 adults who practised yoga at an advanced level, concluded that enhanced body awareness, body image satisfaction

and mindfulness are the mediators of the connection between yoga practice and well-being [15]. And the more they practised, the better was their body awareness.

An Australian study found that long-term male yoga practitioners were more satisfied with their body image than those who regularly worked out in a gym (same schedule with weight training and aerobic training [16]. However, when they looked at men who were total beginners - who had just signed on for their first yoga class prior to the study, it was found that they, like the experienced yoga practitioners, had higher body image satisfaction than the gym-workout exercise group. This could suggest that exercising in gyms leads to increased body image dissatisfaction and higher self-objectification. Alternatively, it may be that men drawn to yoga may have greater body image satisfaction at the outset than those who tend to do general aerobic or weight lifting exercise.

It seems that the reason we practice yoga makes a difference when it comes to body image. Researchers at San Jose State University assessed the body satisfaction of 157 women who regularly practised yoga for over 12 years [17]. With questionnaires they divided the group into those who practiced primarily for physical or appearance reasons (exercise, stretching, flexibility) and those who practiced for psycho-spiritual reasons (increase mindfulness, manage moods, become aware of feelings). The groups did not differ in proficiency, preferred yoga style, ethnicity, or education.

Body satisfaction was higher among those who practised yoga for psycho-spiritual reasons than those who practised for physical appearance.

### Yoga Enhances Compassion and Vagal Tone

Numerous yoga charities have sprung up worldwide over the last couple of decades. Many of these are focused on bringing the practice to disadvantaged or marginal communities, and the wider world. With such a diversity of charitable work, it is impossible to ascribe a single motivation to all yogis who “give back”.

Science may already have some tentative indications of why a yoga practice may make us inclined to want to help others. Although the data is, as yet, sparse, there is research evidence to indicate that yoga practice, especially with an emphasis on breathing and meditation, may have an influence on our behavior and intentions towards others by increasing vagal tone and moving in synchrony.

A review on a total of 2,358 participants found that regular yoga practitioners had increased vagal tone at rest compared to non-yoga practitioners [18]. The vagus nerve, one of the main components of the parasympathetic nervous system, is responsible for controlling or influencing a whole gamut of physical and psychological responses, such as heart rate, mood and immune response.

Interestingly, a controlled vagal tone has been associated with prosocial behaviour [19]. Put simply, prosocial behaviors can be defined as those that are meant to protect or further the welfare of others [20]. They can be characterized by concern for the rights, wellbeing and feelings of others, in other words increased care and empathy for our fellows.

Other clues may come from the observation that moving in synchrony with others can make us more sympathetic and compassionate towards them [21]. Simply synchronising our move-

ments with others can make us more likely to co-operate with them, even at cost to ourselves, and this effect endures after the activity has ceased [22]. University of Oxford researchers have found that when we exercise en masse, we actually release higher quantities of endorphins and endocannabinoids - nature’s chemical pain relievers and mood enhancers - into our nervous systems, thus rewarding our cooperation as a group [23].

Whatever the pragmatic and technical reasons for the phenomenon of yogis’ increasingly reaching out to help others, it should not perhaps come as a surprise, given that one of the stated goals of the practice, as it was originally framed, at least, is to leave individuality behind, and to realise something more profound - a universal interconnectedness in which all humans, indeed all life, share.

### Transformation

“I Am a Nice Person When I Do Yoga!!!” was the title of a paper reporting results from a survey done in the USA in 2014 on 171 people who had regularly practised Iyengar yoga for an average of 12 years [24]. Four themes emerged: yoga practice leads to personal transformation, increases social interaction, provides coping mechanisms to weather relationship losses and difficulties, and leads to spiritual transcendence.

Practitioners believed that their interpersonal relationships improved because their attitude and perspective had changed, making them more patient, kind, mindful, and self-aware. They expressed an aspect of community that was both practical (they met new friends) and spiritual (they felt they belonged). They thought they could better weather difficulties such as divorce and death. Many discussed feeling a sense of purpose and that their practice contributed to a greater good.

### Points to Keep in Mind: Causation, Lifestyle Vs Practice and Science

**Causation:** We don’t know if the long-term practitioners had enhanced physical and mental health prior to ever starting yoga.

In a survey on 211 women who had been practising yoga for as long as 50 years, plus 182 controls matched on age, education, body-mass index, other exercise, processed-food consumption, etc. it was found that the most experienced yoginis weren’t necessarily happier or healthier than the happiest and healthiest non-yoginis [25]. The biggest differences were at the other end of the scale, in that the long-time yoga practitioners were unlikely to be unhealthy or unhappy.

It is difficult to conclusively untangle cause from effect. After all, it’s possible that happy people do yoga, rather than the other way around, or that the discipline necessary to maintain a yoga practice over many decades is the type of character trait that leads to a happy and healthy life, with or without yoga.

As yet, there are no long-term studies which have followed long term practitioners from the beginning of their journey.

We don’t know which aspects of the yoga practice generates the benefits. Lifestyle characteristics may be the primary cause of the effect, and not the yoga practice. But then we are opening another can of worms as to what is “a holistic definition of yoga”, and what is the “active ingredient” that is driving the effects of yoga on health. Experienced yogis may lead a lifestyle less conducive to chronic inflammation and stress, possibly enjoy yoga-related factors such as better diet, meditation

and deliberately calmer lives. However, if true, this may merely emphasise the benefits of a yoga lifestyle further.

We should really bear in mind that the system of yoga has been developed over thousands of years to include a wide range of practices and a specified lifestyle. Western science tends to be reductionist in its methodology. It is important to highlight the challenge of evaluating a complex, holistic, spiritual practice like yoga using a scientific paradigm that requires consistency, simplification and standardization.

Such debates don't undermine the central finding. Whatever the reason, those who make a long-term commitment to yoga tend to be happier and healthier and the benefits continue to accrue the longer they stick with it.

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