



# A study on the effects of yogic practices on physiological variables

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**Abstract:** Both the daily practise of yoga and engaging in regular physical exercise are essential components of a healthy way of life. In order to address the challenges to one's health and physical wellbeing that are brought on by sedentary and post-modern lifestyles, the implementation of such measures has become inescapable and absolutely necessary. The way in which kids are cared for has a direct bearing on the manner in which their personalities develop in all aspects. The social development, psychological growth, and maybe even the physical development of a person will all play a role in the successes that person will achieve in the future. There is a one-to-one relationship between the number of young, productive people a country has and its rate of economic development. It is impossible to realise completeness in a young person's life without attending to their overall development as youngsters. It is essential to keep in mind that physically active pursuits such as running and yoga play a key role in ensuring that children and teenagers develop healthy bodies. Activities such as athletics and yoga are not only excellent for the development of children's bodies, but they are also beneficial for the development of children's minds, and children's minds assist in the growth of children cognitively and intellectually.

**Keywords:** yogic practices, physiological variables, healthy way of life, sedentary lifestyle, post-modern lifestyle, physical exercise, kids' development, social development, psychological growth, physical development, economic development, overall development, physically active pursuits, running, athletics, children's minds, cognitive development, intellectual development

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## INTRODUCTION

The detrimental effects of industrialization, modernization, and urbanisation on people's way of life are well-documented. Toxic food is being produced as a result of the widespread use of high-yield plant types, chemical fertilisers, and pesticides in agriculture. The stress levels of the general public are rising as a result of modern society's more mechanised and hectic way of life. Most people no longer put much thought into their daily activities and instead focus solely on their physical fitness. This has led to a rise in adult obesity and a plethora of related chronic diseases. Children are not immune to this problem. There is a danger to the nation's precious human capital. [1]

Sports and yoga are essential to a well-rounded education, yet they are frequently ignored by the curriculum, the education department, parents, and other concerned stakeholders. It is crucial to place a strong emphasis on elementary and secondary schooling. Sports and yoga are great for kids because they help them grow in all areas of development, not just the physical ones. It's worth noting that the people who matter most in the school system didn't give sports and yoga the attention they deserved. Therefore, in order to have healthy young for the future and for the growth of the nation, there has to be a scientific research of enquiry to prove the function of sports and yoga in overall development of the children. [2]

Young people need to be physically active daily. Growth and better physical, mental, and emotional health are the results of regular physical activity. Researchers in the medical field have shown a correlation between a high level of physical activity in childhood and a lower risk of hypertension, diabetes, obesity, and heart disease in adulthood.

Physical education and athletics are two examples of how schools may be used to foster a culture of health and wellness. Schools are increasingly seen as a key factor in shaping students' physical and mental health, as well as their sense of self-worth, social competence, and behavioural patterns. [3]

## **Yoga**

One of the best activities that everyone may take part in is yoga. Yoga, which has its roots in India and focuses on both mental and physical health, is one of the world's oldest and most dynamic living traditions. An effective method of relieving stress, yoga also promotes spiritual growth and personal development by strengthening body and mind. There are countless ways in which yoga improves the human condition. The connection between health and attractiveness is one of yoga's many advantages. [4]

Throughout the Vedas, which are ancient Indian scriptures and among the oldest manuscripts in existence, references to Yoga can be found, making it one of the six streams of classical philosophy in India. The Upanishads, which were written after the Vedas, are also philosophical treatises that explore deep questions like the "soul" and the cosmos.

However, it is believed that yoga has much deeper roots than that, going back to the oral traditions of yogis, where yoga knowledge was passed down from Guru(spiritual teacher) to Sisalall the way to the 'Rishis,' who first began investigating the nature of reality and man's inner world. [5]

## **Six Branches of Yoga:**

**i. Hatha Yoga:** As the most common type of yoga practised today, Hatha Yoga may be the most well-known yogic discipline. The physical postures (Asanas), breathing exercises, and meditation practised in this yoga tradition have been shown to have beneficial effects on both physical and mental health. Within this discipline exist a wide variety of approaches, including (but not limited to) Iyengar, Integral, Astanga, Kripalu, and Jivamukti. Hatha yoga might be the answer for those seeking mental and physical well-being.

**ii. Bhakti Yoga:** The majority of Indians adhere to Bhakti Yoga. Follow your emotions and your devotion on this journey. Those who practise this form of yoga believe that there is a spark of the divine in everything and everyone. Bhakti Yoga is a spiritual practise that cultivates a person's love and acceptance for all things in order to foster a devotion to the "one" or to Brahma.

**iii. Raja Yoga:** The word raja has regal connotations. The fact that most adherents to this school are members of religious and spiritual groups may contribute to the prestige with which it is regarded as the "king" of Yoga. In the Raja yoga sutras, you'll find the foundation for Raja Yoga, which are the Eight Limbs of Yoga. The self is of paramount importance to a Raja yogi, and as such, reverence for oneself and for all of creation is fundamental to the Raja yogic way of life. When people learn to control themselves, they gain a measure of dignity. Raja Yoga is ideal for anybody looking to develop self-control.

**iv. Jnana Yoga:** Yoga is the branch of yoga concerned primarily with the mind, and as such, it places a premium on the rational capacities of the human mind. Wisdom and intelligence are valued by Jnana Yogis, who seek to merge them in order to break free of convention. They seek understanding and therefore are receptive to other ideologies and religions, on the theory that an open and reasonable mind is essential to learning about the soul.

**v. Karma Yoga:** To serve others is to practise Karma Yoga. Because adherents to this philosophy hold that one's present circumstances are a direct result of his previous deeds, they must take responsibility for their acts if they wish to change their fortune. Giving without expecting anything in return guarantees a future devoid of negativity and self-centeredness. Karma yogis alter their outlook to favour that which is good, and in doing so alter their own selves and, ultimately, their destinies.

**vi. Tantra Yoga:** Tantra Yoga, which is said to be the most misunderstood of all the many ways, entails doing rituals in order to face one's fears. [6]

### **Benefits of Yoga**

**i. Flexibility:** A more flexible body, with more mobility in the muscles and joints, is the result of stretching the stiff body in novel ways. Flexibility of the hamstrings, back, shoulders, and hips can be expected over time.

**ii. Strength:** Balancing on one leg (as in tree pose) or using one's arms as a support are just two examples of the many ways in which yoga challenges us to find new methods to bear our own weight. Changing positions slowly during some workouts is an effective way to build muscle.

**iii. Muscle tone:** Gaining muscle tone is a natural byproduct of strengthening one's muscles. The stretching and strengthening exercises of yoga are great for developing lean, long muscle.

**iv. Pain Prevention:** Some forms of back discomfort can be avoided by taking steps to improve your flexibility and strength. Chronic back discomfort is a common complaint, and many office workers and motorists are to blame. This may lead to muscle tension and spinal compression, both of which yoga can help alleviate. When you practise yoga, you'll notice an immediate improvement in your posture, which can lead to a reduction in back pain and other discomfort.

**v. Better Breathing:** Most of us don't give our breathing much consideration and instead take quick, shallow breaths into the upper chest. Pranayama, a set of breathing techniques practised in yoga, helps us become more attuned to our breathing and teaches us to make more efficient use of our lungs. There are physiological and psychological benefits to taking deep breaths, including as clearing the nasal passages and calming the central nervous system. [7]

### **Mental Benefits:**

**i. Mental Calmness:** Yoga sana is a very physical exercise. The mind is soothed by the practitioner's laser-like focus on the physical activity. Meditation practises, such as becoming aware of one's breathing and then letting it go and without thinking about anything, are also introduced to the practitioner of yoga.

**ii. Stress Reduction:** It is well-known that exercise, and especially yoga, may help reduce feelings of anxiety and tension. Due to the intense focus required, problems of all sizes seem to vanish while practising yoga. This not only gives welcome relief from pressures but also puts things in perspective. We learn to stop worrying about the past and the future and instead focus on the here and now, which is why yoga is so effective in relieving stress. After a yoga session, you'll feel more relaxed than when you arrived.

**iii. Body Awareness:** As we practise yoga, we become more in tune with our bodies. In order to achieve better alignment, it is often necessary to make imperceptible adjustments. Our internal state will get steadily more relaxed as time goes on. Because of this, one's posture may enhance and one's sense of self-assurance may grow.

**iv. Improve sleep:** The benefits of yoga for sleep have been supported by studies. It's possible that this is especially true for the elderly. The sleep quality and duration of yoga practitioners over 60 improved in one research. Additionally, they improved their sleep efficiency, which is the ratio of time spent in bed to time spent asleep. [8]

## **A GUIDE TO USING YOGA TO BETTER YOUR MENTAL HEALTH**

Yoga is best learned from an experienced instructor in a solo session or small group setting. A yoga instructor will be able to help you improve your form and give you tips on how to adjust your posture. To alleviate the difficulty of some postures, props such as blocks and straps can be used. Doing yoga doesn't require you to be on the floor at all; you can do it anywhere, even on a chair. [9]

Yoga can also be taught through a book, DVD, or even the internet. However, attending a live yoga session is the safest option. After you've mastered the fundamentals, books and videos can be useful study tools. Home practise between courses is recommended for maximum benefit, and online instruction may help keep your routine fresh. If you already have a home yoga practise, you may use it to help you cope with times of increased stress, insomnia, or other difficulties. [10]

### **Physical fitness and Exercises**

When asked what constitutes "physical fitness," a term that instantly sparks debate because there is no agreed-upon definition, few people can agree. A doctor may define health and fitness as the absence of illness. Muscular bulk may be the only thing that a weightlifter associates with fitness. A health or physical educator may define fitness as the capacity to complete a predetermined set of callisthenic exercises or the speed with which one can run 600 yards. We are solely concerned with cardiorespiratory fitness, which includes a healthy heart, healthy blood vessels, and healthy lungs. The health of these organs is crucial, making physical fitness of this kind the most essential. There needs to be more than just the absence of illness and the presence of rippling muscular mass. If a person's cardiovascular and respiratory systems do not have sufficient reserves, that person is not physically fit and will not be able to handle the normal or unexpected stresses of everyday living. [11]

### **Exercises:**

Regular physical activity is the key to maintaining a healthy body. Regular physical activity is superior to

other methods for preserving both our physical and mental health and should be prioritised. The amount of oxygen in the blood may be increased by regularly engaging in physical activity, which then confers benefits on each and every one of the body's systems. One of the numerous benefits it provides is a boost in circulation to the body's internal organs. [12]

**The following are some ways in which exercise might be beneficial.**

- The muscles in your body can only grow with regular exercise.
- Toning the muscles is another option.
- The body's immune system removes harmful substances.
- Exercising increases the body's metabolic rate.
- Stimulating the brain via exercise.

Exercising on a regular basis is important for a sound nervous system. However, it's crucial to keep in mind that frequent outside activity is essential. Continuous exercise is recommended, with the caveat that only progressive exercises should be done. We should exercise for our own sake in order to keep our body in great shape; each individual must be his own judge of how much exercise he requires, but it's best to start slowly and work up to a moderate level of activity. No strict guidelines can be put in place to govern it. But it's best to play some kind of outdoor game on a regular basis, since this will serve as both a kind of exercise and a source of entertainment. [13]

## **PHYSIOLOGICAL TERMS**

**i. Blood pressure:** Blood pressure refers to the force per unit area that the blood pushes on the inside of a blood vessel.

**a. Systolic Blood Pressure:** The peak of the systolic response of blood from the ventricles, when arterial blood pressure increases to its greatest level.

**b. Diastolic Blood Pressure:** In the time between heartbeats, arterial blood pressure drops to its lowest point of the day.

**ii. Vital capacity:** It is the maximum volume of air that can be evacuated after taking the deepest inhale that is physically feasible.

**iii. Pulse rate:** Pulse rate is the average number of heartbeats and journal entries that occur in a given time period, expressed as a number.

**iv. Body fat:** Adipose tissue contains an especially high concentration of fat cells, however fat cells can also be found scattered throughout the meshes of other connective tissues. ‘ ‘ There is some debate about whether or not fat cells are distinct cells whose only interest is the accumulation of fat within. Fat cells resemble satellites and can be difficult to identify apart from fibroblasts. Accumulating fat causes cells to expand and round out, with isolated tiny pockets of fat showing up initially. [14]

## METHODOLOGY

It was assumed that the effects of yoga on college students would lead to significant shifts in the levels of a variety of physiological markers that were selected. For the aim of this study, a sample group of thirty college students was selected at random from SSCPE(Sri Sarada College of Physical Education) for in Salem, Tamilnadu. The students' age range from 18 to 21 years old. The current inquiry utilised a pre-test and post-test random group design as its underlying structure. This design comprised both a control group and an experimental group. The participants were arbitrarily divided up into 2 groups, each consisting of fifteen persons and being referred to as Group1' and Group 2 correspondingly. Both groups had the same name. Group 1 was given yoga training, but Group 2 received none at all. For the purpose of conducting the studies on the relevant variables, a bio-monitor was utilised. The data were collected for a total of twelve weeks, both before and after the training that took place. The analysis of the data was performed with the help of the dependent t test.

## RESULTS

**Table 1: Pre and post test means of experimental and control group physiological variables**

S.No	Variables	Pre Test Mean	Post Test Mean
1.	<b>Diastolic Blood Pressure</b>	Exp:84.60	Exp:80.00
		Con:84.93	Con:84.46
2.	<b>Systolic Blood Pressure</b>	Exp:125.26	Exp:121.00
		Con:125.25	Con:124.80
3.	<b>Heart Rate</b>	Exp:78.06	Exp:72.46
		Con:78.13	Con:77.86

**Table 2: Computation of t-ratio between pre- and post-test diastolic blood pressure of experimental and control groups**

Variables	Group	Mean diff	SD	$\sigma$ DM	't' ratio
Diastolic Blood Pressure	Experimental	4.60	1.80	0.45	9.86*
	Control	0.46	2.66	0.67	0.68

Taking a look at table 2, we can see that the obtained t ratio for the diastolic blood pressure of the exploratory group was 9.86, which is greater than the required table value of 2.15 at the 0.04 level of significance with 13 degrees of freedom. This accounted for the decision that it merited special attention. This study showed that doing yoga exercises regularly for six weeks significantly lowered diastolic blood pressure. Consequently, the related theory that had been formulated before was shown to be correct. The estimated t ratio for diastolic blood pressure in the control group was 0.68, which was less than the required table value of 2.15 at the 0.04 significant level and with 13 degrees of freedom. Therefore, it was decided that it wasn't a big deal. The average diastolic blood pressure readings for the study's exploratory and control groups are graphically represented in Figure 1.

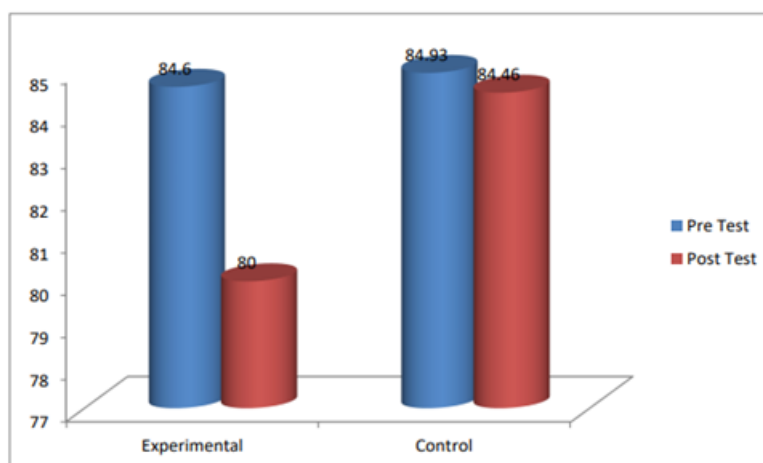


Figure 1: Experimental and control groups' diastolic blood pressure before and after treatment.

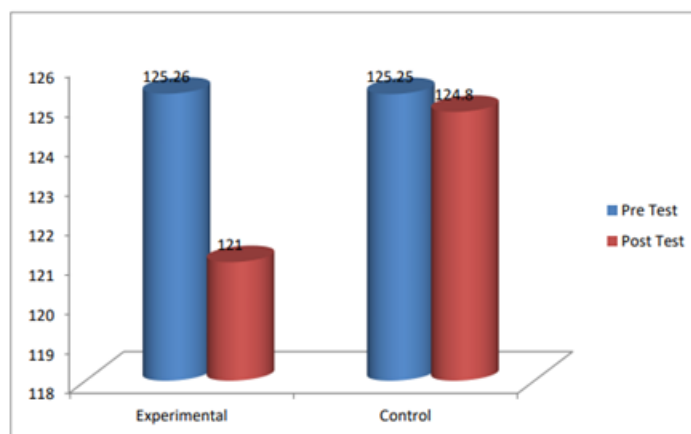
Table 3: Calculating the 't' ratio between pre- and post-test systolic blood pressure values of experimental and control groups

Variables	Group	Mean diff	SD	$\sigma$ DM	't' ratio
Systolic Blood Pressure	Experimental	4.27	2.42	0.61	6.78*
	Control	0.45	2.17	0.55	0.84

The obtained 't' ratio on systolic blood pressure of the exploratory group was determined to be larger than



the needed table value of 2.15 at a significance level of 0.04 and 13 degrees of freedom (table 3). The necessary table value was calculated to be 2.15, leading to this result. As a result, its significance was recognised. Six weeks of yoga activity resulted in a significant decrease in systolic blood pressure, as shown by this study. It follows that the related theory was proven correct. The calculated t ratio for the systolic blood pressure of the control group was 0.84, which was less than the required table value of 2.15 at the 0.04 level of significance with 13 degrees of freedom. The gap was deemed insufficient to warrant further investigation. In Figure 2, we have a visual depiction of the average systolic blood pressure levels in the two groups (exploratory and control).



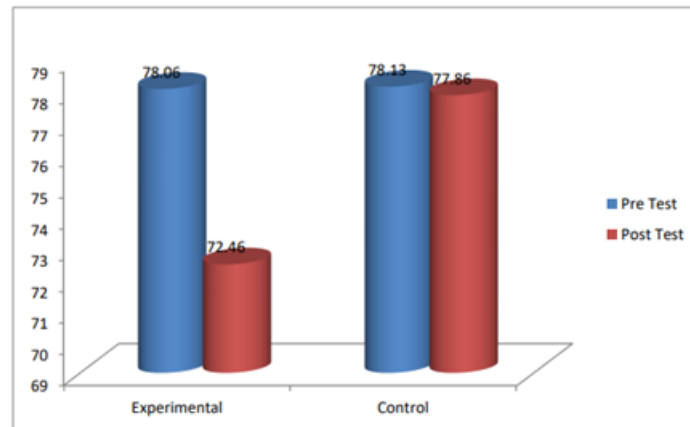
**Figure 2: Experimental and control group systolic blood pressure before and after treatment.**

**Table 4: Computation of t-ratio between pre- and post-test heart rates of experimental and control groups**

Variables	Group	Mean diff	SD	$\sigma$ DM	't' ratio
Heart Rate	Experimental	5.60	1.62	0.43	13.24*
	Control	0.27	1.90	0.48	0.55

The obtained t ratio for the heart rates of the experimental group was 13.24, which was found to be more than the required table value of 2.15 at the 0.04 level of significance with 13 degrees of freedom (table 4). When comparing the table, this was the conclusion. It was therefore recognised as being significant. Findings from this study suggest that frequent practise of yogic movements over a period of six weeks can significantly enhance cardiovascular health. Thus, the related theory was confirmed. The obtained t ratio of 0.55 (with a 0.04 significance level and 13 degrees of freedom) was less than the required table value of 2.15. The heart rates of those serving as controls were found to be this way. This led to the conclusion that the difference was insignificant. Mean heart rate scores for the exploratorygroup are shown graphically in Figure 3.





**Figure 3: Exploratory and control group heart rate pre- and post-mean bar diagram**

## CONCLUSION

The goal of this study was to investigate the effects that practising yoga had on a range of physiological indicators in of college age. It was hypothesised that the influence of yoga on key physiological indicators would lead to a significant variation in the responses of the college who took part in the study. The outcomes of the study indicated that the experimental group that participated in yoga activities had a greater impact on the reduction of the chosen physiological variables compared to the control group. In order to conduct the analysis of the variables, a bio-monitor was utilised. The data was collected both previously and after the course was taught for a total of twelve weeks. In order to do an analysis on the information obtained, the dependent t test was utilised. It was determined that a threshold of 0.05 would be used to determine statistical significance.

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