



EFFECT OF MEDITATION ON BREATH HOLD CAPACITY ON YOUTH

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ABSTRACT

The purpose of the study is to find whether there is any effect of meditation on breath holding capacity or not. To fulfill the specific purpose, the study was conducted on 200 male students of G.B.Pant college, Budaun which are randomly selected as subjects. The subjects were randomly divided in two groups named Treatment group (N=100) and Control group (N=100) respectively. Subjects under treatment group were introduced with the practice of meditation and the control groups were not given any kind of training. Pre and Post data of both groups were recorded after eight weeks of treatment to find the result. The collected data were analyzed by using t-test to find out any differences. The result showed no significant improvement in the data of breath hold capacity of subjects under treatment group. Thus we can say that meditation doesn't have any positive effect on breath holding capacity.

Key Words - Meditation, Breath hold capacity, Treatment Group, Control group, Randomly.

INTRODUCTION

YOGA- Yoga is one of the oldest forms of keeping oneself fit and healthy. Many literatures on Yoga prove that it is the simplest way to increase flexibility, muscle strength better organ functioning to meet the variety for day today life. It tones the muscles of your body with less pain and strain. It is also the safer way for all age groups to keep themselves calm and relaxed.

Life is a series of continuous physical and mental activities. The pace with which life is moving in twenty first century yoga seems to be the best remedy to overcome the stress of day today life. In order to lead a healthy and prosperous life with utmost harmony in society, Yoga can play an important role.

It has been said in many literatures and books that yoga has originated in ancient India. There is no particular date about when and how it started.

The word 'Yoga' itself has been originated from Sanskrit word i.e. 'Yuj' which means union. In broader sense union of soul, mind and body. Yoga is group of physical, mental and spiritual practices.

Yoga is a psycho-somatic- spiritual discipline for achieving union harmony between over mind, body and soul. Yoga is mind-body technique which involves relation, meditation and a set of physical exercises performed in sync with breathing. Being holistic, it is the best means for achieving physical, mental, social

and spiritual well being of the practitioners. This can be achieved by systematic and disciplined practice of Ashtang Yoga described by sage Patangali.¹

Yoga has existed from Vedic times and its importance is described in several scriptures such as Upanishads, Bhagavad Gita and many others. Also Maharishi Patanjali has made great contributions in removing impurities in there domains namely through Ayurveda in body for good health, through commentary on Panini's grammar for good speech and through Yoga for achieving pure mind. The treatise on Yoga by Maharishi Patanjali is known as "Yoga-Sutras". A Sutra is a very cryptic statement with deep insights and it is easy to memories. The Yoga-Sutras contain 196 aphorisms (Sutra) divided into four chapters.

The well known eight steps of Yoga occurs in these Yoga Sutras. The process of Yoga encompasses all aspects of Human life namely physical and spiritual.²

Yoga affects every cell of the body. It brings about better neuro-effector communication, improves strength of the body, increases the optimum functioning of all body organs-systems, increases resistance against stress and diseases and brings tranquility, balance, positive attitude and equanimity in the practitioner which makes him lead a purposeful and healthier life.³

The impact of Asanas on human body is expensive and eternal. The muscles, bones, nervous system, respiratory, circulatory and digestive system of the human body are greatly benefited from regular practice of Asanas. All the body parts are co-ordinated with each other. The body becomes more flexible and are able to adjust is environmental changes after practicing Asanas. The nervous system of body is brought into balance with the help of Asanas.

Long term benefits of Asanas reduce back pain and improved posture. Asanas being isometric, they rely on holding muscle tension for a short period of time. This improves cardiovascular fitness and circulation. Many surveys show that regular Yoga practice may help the blood pressure to normalize.

Asanas effect in improved blood circulation and the massaging effect of surrounding muscles speeds up the sluggish digestion. As the person gets odder, the digestion gets slower and inefficient. Regular practice of Yoga thus results in an improved blood and nerve supply to the digestive and eliminative system which helps in better functioning of digestion.

Yoga improves blood circulation, easing of muscle tension and the act of focusing the mind on the breath all combine to ease the nervous system. Long term benefits include reduced stress and anxiety level.

Meditation is a precise technique for resting the mind and attaining state of consciousness that is totally different from the normal waking state. It is the means for fathoming all the levels of ourselves and finally experiencing the center of consciousness within. Meditation is not a part of any religion; it is a science, which means that the process of meditation follows a particular order, has definite principles and produces results that can be verified.

In meditation, the mind is clear, relaxed and inwardly focused. When you meditate you are fully awake and alert, but your mind is not focused on external world or out the events taking place round you. Meditation requires an inner state that is still and one pointed so that the mind becomes silent. When the mind is silent and no longer distracts you, meditation deepens.⁴

Yogic Meditation is the art and science of systematically observing, accepting, understanding and training each of the levels of our being, such that we may co-ordinate and integrate those aspects of our selves and dwell in the direct experience of the centre of consciousness.

In This study, respiratory functions, cardio-vascular parameters and lipid profile of those practicing Raga Yoga meditation (short and long term meditators) where compared with those of non-

meditators. Vital capacity, tidal volume and breath holding were significantly higher in short term and long term meditators than nonmeditators. Long term meditator had significantly higher vital capacity and expiratory pressure than short term meditators. Diastolic blood pressure was significantly lower in both short and long term meditators as compared to non meditators. Heart rate was significantly lower in long term than in short term and non-meditators. Lipid profile showed a significantly lowering of serum cholesterol in short and long term meditators as compared with non-meditators. This shows the Raja Yoga meditation provides significant improvements in respiratory functions, cardiovascular parameters and lipid profile.⁵

The oxygen we breathe is transferred to our body and delivered to various tissues of our body where it is converted into energy. The waste product of this process is CO_2 , which is carried back to the lungs and released from the body by exhalation. When anybody holds his breath, O_2 is still converted to CO_2 , but it doesn't go anywhere rather it recirculates in the vein, acidifying the blood and signaling the body to breathe, first with burning sensation in the lungs and eventually in the form of strong, painful spasm of the diaphragm.

The blood of season free divers has shown to acidify more slowly than those of us who spend our lives inhaling and exhaling reflexively. Many free divers also practice meditation to calm their hearts. Reducing the body metabolic rates attenuates the conversion of oxygen to CO_2 . Meditation has a calming effect on the mind, as well as breath holding capacity.⁶

Being in a state of meditation means being present with what is. Breathing helps in focusing the mind and brings you back to the present moment. Recognizing the important connection between breathing and meditation, the Buddha taught attention to breath as a fundamental meditation technique. He said "Being sensitive to the whole body, the Yoga breaths in; being sensitive to the whole body, the yogi breaths out."

The breath is always with you when you practice meditation and breathing you gain skill you can use whenever you need to quit and clear the mind. Just following a few breaths in and out- can release the mind and body so you can calmly observe and respond to the world around you, rather than mindlessly react to the event. Mindful breathing is a technique you can use not only during formal meditation, but also in your daily life.⁷

Breath Hold Capacity:

Breath holding capacity is the duration of time a person can hold himself without breathing, neither inhaling nor exhaling from mouth or nose. The average total lung capacity of an adult human male is about 6 liter of air.

REVIEW OF RELATED LITERATURE

Meditation is a wakeful hypo metabolic state associated with greater alertness and causes significant reduction in heart rate, respiratory rate, oxygen consumption, anxiety and plasma cortisol. Regular practice of meditation is highly beneficial and effective in reduction of stress. Meditation involves breathing technique which helps to improve breathing pattern and can be a boon to minimize respiratory disorders. Deep breathing is one of the simplest ways that one can learn to relax. Most of the studies on effect of meditation have been coupled invariably with practice of set of asanas and kriyas. This study differs from others as we have tried to find the effects of meditation alone in sukhasana posture only on parameters related to respiratory functions in healthy young medical students. Resting respiratory rate, Tidal volume, minute volume, vital capacity, FEV1, FEV% and MVV were recorded before meditation training and practice and after a period of meditation training and practice and the results were compared. The decrease in respiratory rate after meditation practice was statistically significant ($P < 0.001$). After 12 weeks of meditation practice there was a statistically significant increase in Tidal Volume ($P < 0.0$). There was statistically significant reduction in the Minute Volume ($P < 0.02$) and also there was a significant change in vital capacity. 12 weeks of meditation practice alone, without incorporating asanas caused

significant reduction in respiratory parameters. Regular practice of meditation is highly beneficial in reduction of stress and to keep good general and respiratory health.⁸

Gove and Gharote⁹ conducted a study on “Immediate effect of one minute KapalBhati on respiratory function” where respiratory rate, minute ventilation and oxygen consumption were significantly increased, while tidal volume was significantly decreased during the practice of Kapalbhati for one minute in twelve police cadets. Immediately after Kapalbhati oxygen consumption was reduced and it was less than the resting value before Kapalbhati practice.

Bhole and Karambelkar¹⁰ studied the “Effect of Yoga training on vital capacity and breath holding time” measuring vital capacity in ml. and breath holding time in seconds respectively in 147 and 139 male, between the age group of 18-50 years, before and after 3 weeks training program in 20 Asanas, two breathing practices and 3 Kriyas at nine yoga camp held during the year 1959-69, at average increase of 15 seconds in breath holding time and 157 ml. in vital capacity were observed after training periods.

Madan Mohan et al (1983)¹¹ studied the effect of Shavasan and savitri Pranayam (a yoga breathing technique categorized by slow, rhythmical and deep breathing cycles in trained subjects (yoga training > 1yr) and found significant decrease in oxygen consumption heart rate and diastolic blood pressure. They attributed it to the ability of subjects to achieve a state of deep psychosomatic relaxation shavasan alone has been shown to be effective in the treatment of hypertension (Datey et.al 1969; Patel and North 1975). This was attributed to a decrease in frequency and intensity of proprioceptive and entroceptive impulse traffic reaching the hypothalamus.

Arjun, Patil, Vilas al.¹² studied the effect of Sudarshan Kriya Yoga, a novel breathing technique conceived by the world renowned spiritual leader and founder of The Art of Living Foundation Sri Sri Ravishankar. Millions of followers all over the world are practicing and reporting positive well being and better health. To see the effect of Sudarsan Kriya Yoga on lipid profile, pulmonary function and Hemoglobin concentration. They conducted a workshop of 8 days consisting of 150 participants. Out of which 55 were included in the study group. Their results show that after practicing Sudarshan Kriya, there was decrease in Total Cholesterol. LDL-Cholesterol along with significant increase in HDL-Cholesterol. There are significant changes in pulmonary function, but statistically non-significant changes in Hematological parameters. From the observation Sudarshan Kriya Yoga may play vital role in reducing total cholesterol ($P<0.05$), LDL-Cholesterol ($P<0.00$) and significantly increase HDL-cholesterol ($P<0.001$). Spiro metric Pulmonary Functions Test studied were Forced vital capacity, Forced Expiratory Volume in first second, Peak Expiratory flow rate and Maximum voluntary ventilation. The result showed improvement in all pulmonary Function parameters in all subjects as compared to before practicing Sudarshan Kriya Yoga.

PROCEDURE

Selection of Subjects: Two hundred students studying in different standards of G.B. Pant(P.G.) College were randomly selected as the subject of the study. The subjects were assigned at random to treatment and restrictive room each group consisting of hundred students.

Instruments Reliability:

The instruments in the study were obtained from standard firms, which carter to the needs of various research laboratories in India and their calibration are accepted as accurate enough for the purpose of the study. To test the instruments reliability few numbers of data were taken to ensure the accuracy of instrument.

Tester Competency:

To ensure that the investigator was well versed in the techniques of conducting the test, the investigator had a number of practice sessions in the testing procedure, under the guidance of an expert. Tester competency was also evaluated together by reliability of tests.

Subjects Reliability:

The above test-retest coefficient of correlation method also established that subjects' reliability was significant at 0.05 level of confidence, as the same subjects were used under similar conditions by the same tester and no motivational techniques were used nor any training imparted.

Treatment Design:

The pre-post random group design was used for the study. Two groups were made randomly. Each group of hundred subjects, one group (N=100) was named Treatment group and were assigned the duty of practice of Transcendental Meditation and the other group (N=100) opted to serve as restrictive group or non-meditators.

Treatment Procedure:

The study was conducted for a period of eight weeks in the month of July and August. The climatic condition was rainy (Humid) and atmospheric temperature was ranging between 28°C to 38°C. Out of 200 students of G.B. Pant College 100 students were randomly selected as subjects for treatment group and the remaining 100 students opted as subjects for restrictive group. Each subjects of treatment group learnt concentrative Meditation (breathing exercise). The subjects of treatment group practiced meditation for 15-20 minutes each day for eight weeks.

The researcher allowed the subjects of treatment group to be comfortable in their sitting position but to keep their back straight either in lotus or Bajrasan position. First, the researcher helped the subjects to perform breathing exercises for 2-3 minutes so as to normalize their body and prepare it for Transcendental meditation. In Transcendental meditation the subjects have to chant any Mantra. Thereafter treatment group practiced Transcendental Meditation for 20 Minutes starting with a silence of half minute and finishing it with a silence of two minutes with closed eyes and deep breathing.

Collection of Data:

The data for physiological variables were collected twice, that is before the start of study and after 8 weeks as to record the final performance of the tests. All the scores were collected on the first day before teaching the meditation to the treatment group and repeated after a period of 8 weeks. Similarly the data were also collected from restrictive group.

□Breath Hold Capacity:

- □**Objective-** To measure breathes holding capacity.
- □**Equipment-** Stopwatch.
- □**Description-** After a long inhalation subjects were stopped from breathing and the time in stopwatch was recorded till he holds his breath.
- □**Score-** The time a subject holds his breathe was recorded in seconds.

The **Paired Sample t-test** is designed to compare means between pre test and post test of same group where there are restrictive and treatment group in different variables in each group. Ideally, these subjects are randomly selected from a larger population of subjects and assigned to treatments.

Once the data are collected and the assumptions to performing the t-test are satisfied, the means of the dependent samples in each two groups are compared. The mathematics for the t-test may be performed by a statistical data analysis programs such as SPSS. The determination of whether there is a statistically significant difference between the two means is reported as a p-value. Typically, if the p-value is below a certain level (usually 0.05 or 0.01), the conclusion is that there is a difference between the two group means. The lower the p-value, the greater "evidence" that the two group means are different. The level of significant was kept at 0.05 levels.

1. Analysis and comparison of selected variable Breath Holding Capacity in between pre and post test of college male students.

A researcher wants to examine whether the **Breath Holding Capacity** of control and experimental groups improved or not.

The null and alternative hypothesis for examining the mean difference in **Breath Holding Capacity** of control and experimental groups:

H₀: There is no difference between **Breath Holding Capacity** of control and experimental groups.
i.e. $\mu_1 = \mu_c$

H₁: There is a difference between **Breath Holding Capacity** of control and experimental groups.
i.e. $\mu_1 \neq \mu_c$

Pair Sample T –Test of Breath Holding Capacity Variable in between pre and post test of control and experimental groups as below:

Table-1(a)

Paired Samples Statistics of Breath Holding Capacity

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Breath Holding capacity	control group pre test	20.7000	100	8.57233	.85723
	control group post test	20.5500	100	8.44277	.84428
Pair 2 Breath Holding capacity	experimental group pre test	33.0800	100	14.98125	1.49813
	experimental group post test	34.0700	100	11.58217	1.15822

GRAPH-6

BREATH HOLDING CAPACITY

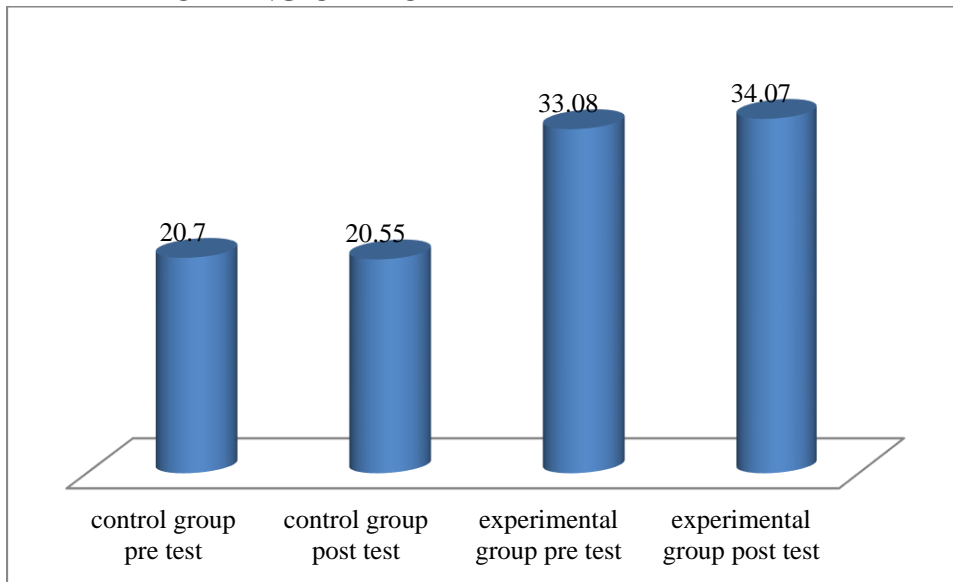


Table-1(b)

Paired Samples Correlations Breath Holding Capacity

		N	Correlation	Sig.
Pair 1 Breath Holding capacity	control group pre test & control group post test	100	0.993	0.000
	experimental group pre test & experimental group post test	100	0.957	0.000

As per the table, Paired Samples Correlations;

- (1) **Pair 1 Breath Holding Capacity** of control group pre and post test correlation is 0.993 and its significance value is 0.000
- (2) **Pair 2 Breath Holding Capacity** of experimental group pre and post test correlation is 0.957 and its significance value is 0.000

Table-1(c)**Paired Samples Test Breath Holding Capacity (B.H.C.)**

	Paired Differences							
	95% Confidence Interval of the Difference							
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1 B.H.C. control group pre - post test	0.1500	0.98857	.09886	-0.0462	0.3462	1.517	99	0.132
Pair 2 B.H.C. experimental group pre - post test	-0.9900	5.14928	.51493	-2.0117	0.0317	-1.923	99	0.057

Table – 1(a) – Pair Samples Statistics displays the summary measures (Mean, N, Std. Deviation, Std. Error of Mean) of selected variable **Breath Holding Capacity** for the Paired t-test.

Table – 1(b) – Paired Samples Correlations provides the information related to correlation between control group pre and post test as well as experimental group pre and post test of Breath Holding Capacity.

Table – 1(c) – Pair Samples Test of both the groups; control and experimental groups in pre and post test are as below:

[1]Pair 1 : Breath Holding Capacity (B.H.C.) control group pre - post test:

Paired Samples Test gives the difference in mean of the **Breath Holding Capacity** of pre and post test of control group is 0.1500. The table generated the value of t-statistic of 01.517 with associated significant value 0.132, which is more than 0.05 (chosen significance value). Therefore, we cannot reject the null hypothesis and say that there is no improvement in **B.H.C.** of post test by the students as compared to **B.H.C.** of pre test. We can say that there is no significant difference in **B.H.C.** in control group.

[2]Pair 2 : Breath Holding Capacity (B.H.C.) experimental group pre - post test:

Paired Samples Test gives the difference in mean of the **B.H.C.** of pre and post test of experimental group is -0.990. The table generated the value of t-statistic of -1.923 with associated significant value 0.057, which is more than 0.05 (chosen significance value). Therefore, we can not reject the null hypothesis and say that there is no improvement in **B.H.C.** of post test by the students as compared to **B.H.C.** of pre test. We can say that there is no significant difference in **B.H.C.** in experimental group.

CONCLUSION

Analysis and comparison of selected variable Breath Holding Capacity in between pre and post test of college male students.

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