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Effect of Meditation on Respiratory Rate on Youth

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Abstract

The purpose of the study is to find whether there is any effect of meditation on respiratory rate 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 group was 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 significant improvement in the data of respiratory rate of subjects under treatment group. Thus we can say that meditation can be used by athletes for improving performance.

Keywords: Meditation, Respiratory Rate, Treatment Group, Control Group, Randomly.

Introduction

Yoga is an ancient Indian way of life, which includes changes in mental attitude, diet, and the practice of specific techniques such as Yoga Asanas, breathing practices (Pranayam) and meditation to attain the highest level of consciousness. It has been found that yogic practices leads to considerable health benefits, including cognition, respiration, reduced cardiovascular risk, body mass index, blood pressure and diabetes. Yoga also influenced immunity and ameliorated joint disorder.

The word meditation is derived from the Latin world 'Meditatio' which means to thinks, contemplate devise, ponder.

A part from the spiritual goal of Samadhi, there are many other benefits of meditations, poise, equanimity, metal and emotional tranquility. Meditation can also help to heal physical ailments and reduce high blood pressure.

Meditation is a mental discipline by which one attempts to get beyond the conditioned, 'thinking' mind into a deeper state of relaxation or awareness. Meditation often involves turning attention to a single point of reference. It is organized as a component of almost all religious and has been practiced for over 5000 years. It is also practiced outside religious traditions. Different meditative disciplines compass a wide range of spiritual and psychophysical practices which may emphasis different goals from achievements of a higher state of later evolved into the more specific meaning 'contemplation'.

Meditation is a word that has come to be used in a very casual manner in the modern society. It brings confusion for person as to how to perform it or practice it. Some people use it when they are thinking or contemplating. Some other refers to day dreaming or fantasizing. However, meditation is not any of these.

The Tibetan word for meditation is 'Gom' which means 'to become familiar with' and has the strong implication of training the mind to be familiar with states that are beneficial for concentrations, compassion, correct understanding, humility, perseverance etc.

Meditation or Dhyana is the seventh step Patanjali's eight-fold path. These practical techniques of focusing the mind take us to the ultimate goal of Yoga. Samadhi the attainment of self-realization and state of becoming one which the universe or the absolute. One more immediate level of meditation came as a way of quieting the buzz of images, thoughts and perception that crowd the mind during our walking lives.

Significance of the Study

The significance of the study would continue to promotion of youth in the competitive field in the following ways:

1) The study will provide authentic understanding of practicing Meditation for youth.
2) The study will be high lighting the effect of practicing Meditation on physiological variables.
3) The study will be significance with regard to provide a scientific explanation for the meditations and rejecting the concepts of meditations in ancient times as a difficult technique used only attainment of supernatural power.

Aim of the Study

The main aim of the study was to find whether meditation do have any effect on respiratory system or not. As we all know colleges in rural areas have maximum students of rural vicinity and they have many house hold things to do other than taking part in any training given to them. Even though some of them do participate in training they don't come regularly. So, because of this problem researcher tries if meditation can improve the performance of the students. Many article are there on internet and journal that has showed positive effect of meditation.

Review of The Literature

This study was carried out to know the effect of yog asanas on selected physiological and psychological variables among female geriatric people. The study was conducted on 40 geriatric people in totally two groups, namely, restrictive & treatment group. Treatment group consisted of 15 geriatric people. They underwent eight weeks practice in Pavanamuktasana series, Asana, Pranayama, Meditation and Relaxation whereas the restrictive group did not undergo any type of training. Physiological and psychological variables were measured before and after the experimentation using the standardized tests and standard/modified questionnaires. Analysis of Covariance (ANCOVA) analyzed the data and it was concluded that the Pavanamuktasana series, Asana, Pranayama, Meditation and Relaxation had significant of (P<.05) effect of physiological and psychological variables among geriatric people.

Baljinder S. Bal et. al studied to assess the effects of 4 week yogasanas training on balance and agility in girls. A group of 30 high school girls aged 12-16 years, who participated in inter school Yoga competition and in the catch them Young (CTY) program, volunteered to participate in the study. They were randomly assigned into Yoga Asana (Y) and restrictive (C) groups, n= 15 each. The yoga asana groups were subjected to 4-week training consisting of various asanas (Haumasana, Sarvanyasana, Dhaurasana, Chakrasana, Halasana, and Ardha Matoyendrasana). Student's t-test for independent data was used to assess the differences between groups and for dependent data to assess the post-pre differences. The level of P< 0.05 was considered significantly. The balance and agility significantly improved in group Y compared with the restrictive one. The Yoga asana training may be recommended to improve balance and agility and may contribute to enhance concentration based performance.

This study was designed to quantify and compare the instantaneous heart rate dynamics and cardio pulmonary interactions during sequential performance of three meditation protocols with different breathing patterns. We analyzed beat to beat heart rate and continuous breathing signals from 10 experienced meditators (4 Females; 6 males; mean age 42 years: range 29-55 yrs) during three traditional interventions, relaxation response, breath of fire and segmental breathing. Results showed that Heart rate and respiratory dynamics were generally similar during the relaxation response and segmented breathing. We observed high amplitude, low frequency oscillations due to respiratory sinus arrhythmia during both the relaxation response and segmented breathing, along with significantly (P<0.05) increased coherence between heart rate and breathing during these two maneuvers when compared to base line. The third technique, breath of fire, was associated with a different pattern of response marked by a significant increase in mean heart rate with respect to baseline (P<0.01), and a significant decrease in coherence between heart rate and breathing (P<0.05).

Breath-focused meditation and yogic breathing practices have numerous known cognitive benefits, including increased ability to focus, decreased mind wandering, improved arousal levels, more positive emotions, decreased emotional reactivity, along with many others. To date, however, no direct neurophysiological link between respiration and cognition has been suggested.

Michael Christopher, Dockree, O'Connell, Peter R. , Joshua H, Robertson studied for the first time that breathing -- a key element of meditation and mindfulness practices -- directly affects the levels of a natural chemical messenger in the brain called noradrenaline. This chemical messenger is released when we are challenged, curious, exercised, focused or emotionally aroused, and, if produced at the right levels, helps the brain grow new connections, like a brain fertiliser. The way we breathe, in other words, directly affects the chemistry of our brains in a way that can enhance our attention and improve our brain health.

The study was carried out by the above researchers at Trinity College Institute of Neuroscience and the Global Brain Health Institute at Trinity, found that participants who focused well while undertaking a task that demanded a lot of attention had greater synchronisation between their breathing patterns and their attention, than those who had poor focus. The authors believe that it may be possible to use breath-control practices to stabilise attention and boost brain health. This study has shown that as you breathe in locus coeruleus activity is increasing slightly, and as you breathe out it decreases. Put simply this means that our attention is influenced by our breath and that it rises and falls with the cycle of respiration. It is possible that by focusing on and regulating your breathing you can optimise your attention level and likewise, by focusing on your attention level, your breathing becomes more synchronised.

Kuniko Yamamoto-Morimoto, Shuji, Rikio, Kunihiko, Department of Clinical Rehabilitation,

Osaka Prefecture University, Osaka, Japan, studied to assess the effects of 8 weeks of asana and asana with pranayama lessons in order to clarify the influence of two different combinations of yoga practice on physical and respiratory functions in healthy inactive middle-aged people. A total of 28 participants (mean age: 52.7 years) were divided into a yoga asana (YA) group and YA with pranayama (YAP) group. Participants attended a 70-min session once a week for 8 weeks. The YA group practiced basic asana without specific breathing instructions, while the YAP group practiced basic asana with specific breathing instructions (pranayama). Respiratory function was measured with an autospirometer. Physical function assessments included the 30-s chair stand test and upper and lower extremity flexibility. All tests were assessed at baseline and after 8 weeks of intervention. Changes in scores were analyzed with the paired *t*-test for each group. Pre-post results were compared for all the measured values. $P < 0.05$ was considered statistically significant. Both groups showed significant improvements in physical and overall respiratory functions after the 8-week yoga intervention. However, the maximal inspiratory pressure and lower extremity flexibility improved only in the YAP group. The 8-week yoga intervention for healthy inactive middle-aged people improved the overall respiratory and physical functions, and the inclusion of pranayama had the added benefit of improving inspiratory muscle strength and global body flexibility.

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^{o}C to 38^{o}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.

Respiratory Rate

Objective

To measure respiratory rate.

Equipment

Stopwatch.

Description

The subjects were instructed to remain in supine lying position. The researcher then recorded rate of respiration in unit counts per minute by carefully watching the movements of subject's abdomen.

Score

The total number of respiratory movements of abdomen per minute was recorded.

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.

Analysis and comparison of selected variable Respiratory Rate in between pre and post test of college male students

A researcher wants to examine whether the Respiratory Rate of restrictive and treatment groups improved or not.

The null and alternative hypothesis for examining the mean difference in Respiratory Rate of restrictive and treatment groups:

H_o

There is no difference between Respiratory Rate of restrictive and treatment groups. i.e. $\mu_1=\mu_c$

H_1

There is difference between Respiratory Rate of restrictive and treatment groups. i.e. $\mu_1\neq\mu_c$

Pair Sample T –Test of Respiratory Rate Variable in between pre and post test of restrictive and treatment groups as below:

Table-(1)
Paired Samples Statistics of Respiratory Rate

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Respiratory Rate	restrictive group pre test	24.3900	100	6.83262	.68326
	restrictive group post test	24.2100	100	6.10397	.61040
Pair 2 Respiratory Rate	treatment group pre test	33.7200	100	8.78369	.87837
	treatment group post test	31.9500	100	8.12823	.81282

Graph-5
Respiratory Rate

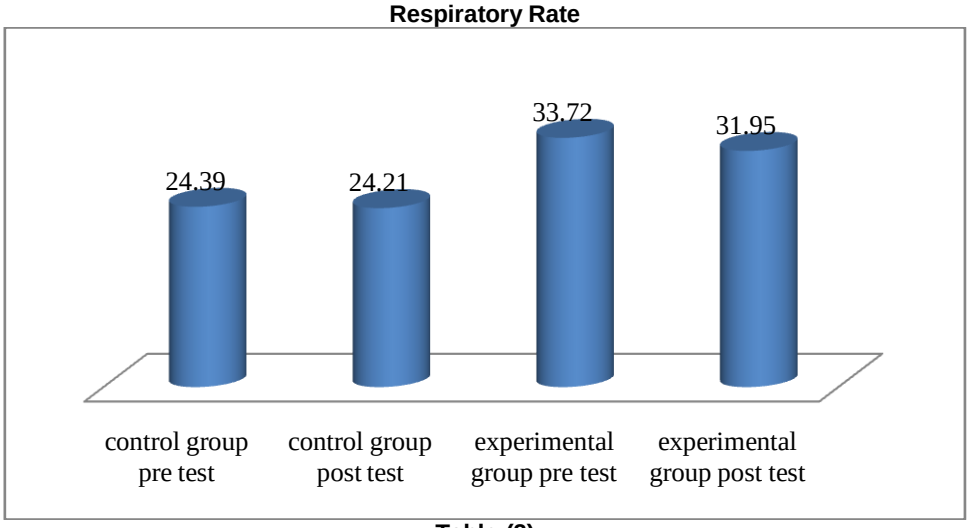

Table-(2)
Paired Samples Correlations of Respiratory Rate

		N	Correlation	Sig.
Pair 1 Respiratory Rate	restrictive group pre test & restrictive group post test	100	0.960	0.000
Pair 2 Respiratory Rate	treatment group pre test & treatment group post test	100	0.987	0.000

As per the table, Paired Samples Correlations;

1. Pair 1 Respiratory Rate of restrictive group pre and post test correlation is 0.960 and its significance value is 0.000
2. Pair 2 Respiratory Rate of treatment group pre and post test correlation is 0.987 and its significance value is 0.000

Table-(3)
Paired Samples Test of Respiratory Rate

	Paired Differences							
	95% Confidence Interval of the Difference							
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1 Respiratory Rate restrictive group pre - post test	0.1800	1.97653	0.19765	-.2122	.5722	00.911	99	0.365
Pair 2 Respiratory Rate treatment group pre - post test	1.7700	1.51661	0.15166	1.4691	2.0709	11.671	99	0.000

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

Table – (2) – Paired Samples Correlations provides the information related to correlation between restrictive group pre and post test as well as treatment group pre and post test of Respiratory Rate.

Table – (3) – Pair Samples Test of both the groups; restrictive and treatment groups in pre and post test are as below:

Pair 1 : Respiratory Rate restrictive group pre - post test

Paired Samples Test gives the difference in mean of the Respiratory Rate of pre test and post test of restrictive group is 0.1800 The table generated the value of t-statistic of 0.911 with associated significant value 0.365, which is more than 0.05 (chosen significance value). Therefore, we cannot reject the null hypothesis and say that there is no improvement in Respiratory Rate of post test by the students as compared to Respiratory Rate of pre test. We can say that there is no significant difference in Respiratory Rate in restrictive group.

Pair 2 : Respiratory Rate treatment group pre - post test

Paired Samples Test gives the difference in mean of the **Respiratory Rate** of pre test and post test of treatment group is 1.7700 The table generated the value of t-statistic of 11.671 with associated significant value 0.000, which is less than 0.05 (chosen significance value). Therefore, we reject the null hypothesis and say that there is improvement in Respiratory Rate of post test by the students as compared to Respiratory Rate of pre test. We can say that there is significant difference in Respiratory Rate in treatment group.

Conclusion

Analysis and comparison of selected variable Respiratory Rate in between pre and post test of college male students.

Pair 1: Respiratory Rate restrictive group pre - post test

Paired Samples Test gives the difference in mean of the Respiratory Rate of pre test and post test of restrictive group is 0.1800. The table generated the value of t-statistic of 0.911 with associated significant value 0.365, which is more than 0.05 (chosen significance value). Therefore, we cannot reject the null hypothesis and say that there is no improvement in Respiratory Rate of post test by the students as compared to Respiratory Rate of pre test. We can say that there is no significant difference in Respiratory Rate in restrictive group.

Pair 2 : Respiratory Rate treatment group pre - post test

Paired Samples Test gives the difference in mean of the **Respiratory Rate** of pre test and post test of treatment group is 1.7700. The table generated the value of t-statistic of 11.671 with associated significant value 0.000, which is less than 0.05 (chosen significance value). Therefore, we reject the null hypothesis and say that there is improvement in Respiratory Rate of post test by the students as compared to Respiratory Rate of pre test. We can say that there is significant difference in Respiratory Rate in treatment group.

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