

Effects of Uddiyan Bandha Yoga On The Cardio-Respiratory Functions of Collegiate Students

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Abstract

The prevalent objectives of the study were to investigate the effects of “Uddiyan Bandha”. Yoga on the cardio-respiratory functions of collegiate students. Subject for the present study were taken from Shri Sant Sawata Mali College, Phulambri, Dist. Aurangabad (M.S.). Twenty college students were selected as the subject for the study. The study was conducted during the month of Aug. 2008 to Sept. 2008. The subjects were randomly assigned to two groups. Ten (10) were in experimental group and another Ten (10) were kept in control group, their age ranged 18 to 25 years. For assessment of vital capacity measure by the Spiro meter in liters, however breath holding capacity (after inspiration & expiration) was measure by the standard stop watch. Before administrating the initial test subject were properly oriented to the correct procedure at performing test. After six week of treatments with Uddiyan Bandha to experimental group, the same tests were again repeated on all the subjects, control group was given no treatment. For determine the significance difference of initial of pre & post test means, t-test was employed. The level of significant set up at .05 level of confidence. After analysis of data, it was found that the mean performance of the experimental group is certain measure of Respiratory Rate ($t=6.54$, $P<0.5$); Finally, increase in cardio respiratory functions of Uddiyan Bandha may be attributed due to increase in strength among respiratory system, the circulating systems and the digestive systems.

Introduction

The word Bandha means to hold or tighten. Bandha are powerful yoga practice where certain organs of body are gently but powerfully gripped contracted and tightened. They massage internal organs and serves to strengthen the vital power or nerve energy. “Uddiyan Bandha” (abdominal contraction) compresses the digestive organs, adrenal glands, kidneys and most important the solar plexus. Yoga is one of the latest approaches which now a days is dealt more scientifically (Macthi A. et. al. 2000). Numerous researches (Damodaran A. et. al. 2000, Harinat Ketial 2000) in yoga reveals that there are overwhelming fruitful results for human being practicing yoga exercise yogic exercises deals with the vitals organs of the body, On which health depends the precursor of physical fitness lies in the efficient working of vital organs of the body and yoga (Tellas S 2000). Yoga was evolved as a method of living a pleasant life thousands of years back. That era was the era of religion where faith was supreme and this was imparted by yoga (Rayvs 1991). Studies related to yoga reveals that heart rate increases or decreases in a individual performing different types of yogic exercises. In one instances (Tellas Setal 2004). Documented stopping of heart rate for 15 seconds on electro cardio gram in a yogi. Also reduction in respiratory rate as low as 4 minutes has found in a yogi doing Pranayamas. Increase in breath holding time, vital capacity and other lung functions have been found improved in subjects practicing yoga exercises (Madan Mohom et. al. 2004). Cardio respiratory deals with heart and exchange of gases between blood of man and its environment.

The importance of the selected physiological variables as heart rate, vital capacity, breath holding capacity, respiratory rate on the volleyball players is overwhelming. If heart rate is much less, then the players would not get fatigue soon as their wilt be less pressure on the heart (Bowman A.J. et. al. 1997). If vital capacity of the players is high then more amount of O₂ could be inhaled and maximum of CO₂ could be exhaled out (Culos – Reed S et. al. 2006). This will thus purify the blood and thus give more energy to the players. More is the capacity of the players to hold breath in itself will certainly increase the endurance of the players in long run (Jam SC 1991). If respiratory rate is less in the players then it will avoid excess load on heart and decrease fatigue. As a result, they manage the internal organs and serves to strengthen the vital power or nerve energy. They bind the flow of Prana i.e. vital energy and improve internal functions. Thus after analyzing all above mentioned reasons, this study was selected to know about the effect of Uddiyan Bandh yoga practices on cardio respiratory fitness of players.

Methodology

In this section of subject, selection of variable, training program, criterion measure collection of data procedure for administration of test list and statistical and analysis were mentioned. The present study is undertaken with a view to examine the effect of progressive Uddiyan Bandh yogic exercises on cardio- respiratory functions of inter collegiate Students.

Selection of Subjects

Total ten Inter Collegiate students ten other students, were selected for the present study. Thus to check Uddiyan Bandh yoga on students it is planned to select two groups Viz. 'A' group and 'B' group. A and B groups is taken from collegiate students. Each group is of 10 players. Group 'a' is considered as experimental group and group B is control group.

Training Program:

Uddiyan Bandh yoga is applied for 6 weeks. Firstly the players slightly bent forward at an angle of 60° by keeping hands on knees. Close eyes and relax for a while. Exhale deeply and retain the air outside. Then contract the abdominal muscles inward and upward as for as possible. Remain in the position as long as breath is released out. Release the abdomen to return in normal position. Repeat it after normal respiration for 10 times or as many as convenient.

Progressive Uddiyan Bandh was only practically applied on experimental group (A). This training program was implemented only for 5 days in a week. There was no hindrance in their daily routine program.

Selection of Variables:

The physiological variables selected for this study are as follows.

1. Resting Heart Rate (Resting)
2. Respiratory Rate
3. Vital Capacity
4. Breath Holding Capacity (After expiration)
5. Breath Holding Capacity (After inspiration)

In yogic exercises Uddiyan Bandh exercises was selected.

Criterion Measures:

The criterion measure chosen for this study were as follows.

Heart Rate: -

The purpose of this test was to measure the number of heart beat of the subject in one minute. Heart rate was taken in early morning by electronic watch. The tester requests the subjects not to do any exercised in case come subject do the exercises prior of test they were asked

to sit down quietly for ten minutes before taking his heart rate. Total number of heart beats per /minutes for each subjects was recorded as his score.

Respiratory rate:-

The respiratory rate was noted by keeping palm on the stomach and counting the total number of breath for a period of 30 seconds and doubled later on to get the respiratory rates per minute. In one minute the number of breath was counted. This total number was saved as authentic data.

Vital Capacity:-

Vital capacity was measured with dry Spiro-meter in liters and the Spiro-meter was placed on such a height that all subjects could tested in standing position. The inner dial of the Spiro-meter was set on zero mark at the beginning of the test.

The subject was requested to take the breaths before starting the test and after exhalation; the Spiro-meter was put in the subject's mouth, taking precaution that no air escapes through the edges of the mouth piece. The subjects were exhale slowly and steadily while bending forward slightly until the maximum volume of air could be exhaled without taking in second breath. The subject was instructed to blow out air only through the mouth and not through nose. Each subject was provided a trail before, the final test. Best effort of each subject was recorded as score in liters.

Breath holding capacity (After Expiration):-

Breath holding capacity after expiration of players was tested by an electronic watch. The players stand erect with legs bended. After getting signal the player exhale air through his nostrils. Then the nose would be locked or closed with nose clip. According to their capacity the players hold air outside. The total time of air holding of the players was measured in seconds.

Breath holding capacity (after inspiration):-

Breath holding capacity after inspiration of player was tested by an electronic watch. The players stand erect with legs bended. After getting signal player inhale air through his nostrils, then the nose would be locked or closed with nose clip. The total time of air holding capacity after inspiration of the players is measured in seconds.

Results and Discussion

The statistical analysis of data for the physiological comparison including vital capacity, resting heart rate, respiratory rate, breath holding capacity after expiration and inspiration between control and experimental group are systematically presented in this chapter.

For testing the significance level was set at 0.05. The value of 't' ratio needed to be significant at 0.05 level with 18 degree of freedom was 2.10.

Mean, Standard Deviation and t-value of pre test, post test on physiological variables of experimental group pre given in table 1-10.

Mean, Standard Deviation and t-value of post test on selected physiological variables of control group and experimental group are given in table 11-15.

Table 1

Statistical significant difference of means standard Deviation and t-ratio of selected physiological variable with respect to vital capacity of control groups.

Variable	Test	Number	Means	S.Ds.	t-ratio
Vital Capacity	Pre Test	10	2200	518.85	0.43
	Post Test	10	2300	477.49	

N.S. = Not Significant

With regards to selected Physiological Variable in Vital Capacity of Pre and post Test of control group, they have obtained the mean values of 2200 and 2300 respectively. Which are given in Table-1 reveals that no significant difference was found out in (t=43) physiological variable with respect to vital capacity of control group.

Table 2

Statistical significant difference of means standard Deviation and t-ratio of selected physiological variable with respect to resting heart rate of control groups.

Variable	Test	Number	Means	S.Ds.	t-ratio
Resting Hear rate Capacity	Pre Test	10	64.5	5.89	0.95 NS
	Post Test	10	62.3	4.23	

N.S. = Not Significant

With regards to selected Physiological Variable in Resting heart rate of Pre and Post Test of control group, they have obtained the mean values 64.5 and 62.3 respectively. Which are given in Table 2 reveals that no significant difference was found out in (t=0.95) of physiological variable with respect to Resting Heart rate of control group

Table 3

Statistical significant difference of means standard Deviation and t-ratio of selected physiological variable with respect to Respiratory rate of control groups.

Variable	Test	Number	Means	S.Ds.	t-ratio
Respiratory Rate	Pre Test	10	20.5	1.81	0.32 NS
	Post Test	10	19.6	2.04	

N.S. = Not Significant

With regards to selected Physiological Variable in Respiratory rate of Pre and Post Test of Control group, they have obtained the mean values of 20.5 and 19.6 respectively. Which are given in Table 3 reveals that no significant difference was found out in (t=0.32) of physiological variable with respect to Respiratory rate of control group.

Table 4

Statistical significant difference of means standard Deviation and t-ratio of selected physiological variable with respect to Breath holding capacity after expiration of control groups.

Variable	Test	Number	Means	S.Ds.	t-ratio
Breath holding capacity after expiration	Pre Test	10	40.0	5.60	0.65 NS
	Post Test	10	38.2	6.66	

N.S. = Not Significant

With regards to selected Physiological Variable in Breath holding capacity (after expiration) of Pre and Post Test of control group, they have obtained the mean values of 40 and 38.2 respectively. Which are given in Table 4 reveals no significant difference was found out in (t=0.65) of physiological variable with respect to Breath holding capacity (after expiration).

Table 5

Statistical significant difference of means standard Deviation and t-ratio of selected physiological variable with respect to Breath holding capacity of control groups.

Variable	Test	Number	Means	S.Ds.	t-ratio
Breath holding capacity after inspiration	Pre Test	10	30	2.52	1.97 NS
	Post Test	10	27.5	3.11	

N.S. = Not Significant

With regards to selected Physiological Variable in Breath holding capacity (after inspiration) of Pre and Post Test of control group, they have obtained the mean values of 30 and 27.5 respectively. Which are given in Table-5 reveals that no significant difference was found out in (t=1.97) of physiological variable with respect to Breath holding capacity after inspiration.

Table 6

Statistical significant difference of means standard Deviation and t-ratio of selected physiological variable with respect to Respiratory of experimental.

Variable	Test	Number	Means	S.Ds.	t-ratio
Respiratory Rate	Pre Test	10	21.5	2.5	5.02 NS
	Post Test	10	19.9	0.94	

Significant = 0.5 level

With regards to respiratory rate physiological variable of pre and post test of experimental groups, they have obtained the mean values of 21.5 and 19.9 respectively, which are given in Table 6 reveals that significant difference was found out in (t=5.02, P< 0.05) pre and post test of experimental groups. The results showed that there was significant effect of 'Uddiyan Bandh' on the respiratory rate functions of experimental groups.

Table 7

Statistical significant difference of means standard Deviation and t-ratio of selected physiological variable with respect to Vital capacity of experimental groups.

Variable	Test	Number	Means	S.Ds.	t-ratio
Vital Capacity	Pre Test	10	2810	400	1.286 NS
	Post Test	10	3420	254.95	

N.S. = Not significant

With regards to respiratory rate vital capacity physiological variable of pre and post test of experimental groups, they have obtained the mean values of 2810 and 3420 respectively, which are given in Table 7 reveals that no significant difference was found out in (t=1.28) pre and post test of experimental groups. The results showed that there was no significant effect of 'Uddiyan Bandha' on the Vital Capacity functions of experimental group.

Table 8

Statistical significant difference of means standard Deviation and t-ratio in with respect to Resting Heart Rate physiological variable in Pre and Post test of experimental groups.

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Variable	Test	Number	Means	S.Ds.	t-ratio
Resting Heart Rate	Pre Test	10	46.1	5.95	1.34 NS
	Post Test	10	36.1	5.93	

N.S. = Not significant

With regards to Resting Heart Rate physiological variable of Pre and Post test of experimental groups, they have obtained the mean values of 46.1 and 36.1 respectively, which are given in Table 8 reveals that no significant difference was found out in ($t=1.34$) pre and post test of experimental groups. The results showed that there was no significant effect of 'Uddiyan Bandh' on the respiratory rate functions of Experimental groups.

Table 9

Statistical significant difference of means standard Deviation and t-ratio in with respect to Breath holding capacity (after expiration) of experimental groups.

Variable	Test	Number	Means	S.Ds.	t-ratio
Breath Holding Capacity (After expiration)	Pre Test	10	51.7	14.3	0.87 NS
	Post Test	10	56.4	9.07	

N.S. = Not significant

Table 9 shows the reveals that no significant difference was found out in ($t=0.87$) pre and post test of experimental groups. The results showed that there was no significant effect of 'Uddiyan Bandh' on the Breath Holding Capacity (After Expiration) of Volleyball Players.

Table 10

Statistical significant difference of means standard Deviation and t-ratio in with respect to Breath holding capacity (after Inspiration) of experimental groups.

Variable	Test	Number	Means	S.Ds.	t-ratio
Breath Holding Capacity (After Inspiration)	Pre Test	10	46.9	7.19	0.64 NS
	Post Test	10	52	5.62	

N.S. = Not significant

Table 10 illustrate the reveals that no significant difference was found out in ($t=0.64$) pre and post test of experimental groups. The results showed that there was no significant effect of 'Uddiyan Bandh' on the Breath Holding Capacity (After Inspiration) functions of students.

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