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Jasbir Singh
Research Scholar Panjab
University, Chandigarh, Punjab,
India

Dr. Prasanta Kumar Das
Associate Professor Tripura
University, Tripura West,
Tripura, India

Effect of yogic exercises on forced vital capacity and resting pulse rate of undergraduate male students

Jasbir Singh and Dr. Prasanta Kumar Das

Abstract

This study was designed to find out the effect of selected Yogic exercises on forced vital capacity (FVC) and resting pulse rate (RPR) of undergraduate male students. To achieve this purpose a total of sixty (n=60) undergraduate male students were purposively selected from Akal college of physical education Mastuana Sahib, Sangrur (Punjab) as subjects. All subjects were healthy having no physical ailment and their age ranged from 18 to 22 years. The selected subjects were randomly divided into two equal groups. Group I served as the treatment group (n=30) and group II was treated a control group (n=30). The dependent variables selected for this study (FVC and RPR) were measured with a spirometer and radial pulse method respectively. All the subjects were tested at baseline and after the 6 weeks training period for FVC and RPR. Random group pre-test and post-test design was used as an experimental design. Then the collected data was statistically analyzed by using dependent 't'-test. The result showed a significant ($p < 0.05$) improvement in FVC with no change in RPR of the experimental group and there was no significant change was recorded in the control group on FVC and RPR. It concludes that even 6-week yogic exercises are effective enough on forced vital capacity in undergraduate male subjects.

Keywords: Forced vital capacity, resting pulse rate, spirometer, yoga

Introduction

“Yoga is a method by which the restless mind is calmed and the energy is directed into constructive channels” (Iyengar, 1989) [6]. Yoga defines itself as a science that is a practical, methodical, and systematic discipline or set of techniques that have the lofty goal of helping human beings to become aware of their deepest nature (Kumar, 2014). From ancient times, people are doing yoga without knowing its significance in health. In the modern era, due to the poor lifestyle, the health status of the people has been decreased. Especially in case of students there are so many health issues are reported, cardiorespiratory disorders are one of the major issue among them. According to the American Heart Association (2002) [2] “cardiovascular disease is the number one cause of death worldwide” and lung health of the youth is also not up to the mark (Kamat, 1977) [9]. But the heart and lung health can be easily improved with small changes in lifestyle (Chhabra *et al.*, 2014) [3] and by adding yogic exercises into one's routine. “Yoga can help lower blood pressure, increase lung capacity, improve respiratory function and heart rate, and boost circulation and muscle tone” (American Heart Association, 2012) [1]. The beneficial effects of different yogic exercises are well-reported and have a sound scientific basis (Lakhera *et al.*, 1984; Joshi and Gokhale, 1992) [10, 7]. In the present scenario, Yoga has become both physical activity and a spiritual practice. Yogic practice is a key to good health (Gopal, Bhatnagar, Subramanian, and Nishith, 1973; Gupta and Sawane, 2012) [4, 5], hence yogic exercises are important for improving the physical and physiological health of each individual (Udapa, Singh, and Settivar, 1975) [11]. Therefore, this study is designed to scrutinize the effect of yogic exercises on forced vital capacity and resting pulse rate of undergraduate male students.

Methodology

To achieve this purpose a total of sixty (n=60) undergraduate male students were purposively selected from Akal college of physical education Mastuana sahib, Sangrur (Punjab) as subjects. All subjects were healthy and having no physical ailment with their age ranged from 18 to 22 years. The selected subjects were randomly divided into two groups.

Correspondence
Jasbir Singh
Research Scholar Panjab
University, Chandigarh, Punjab,
India

Group I served as the treatment group, practiced yogic exercises for six weeks and group II was treated as a control group that didn't participate in any special yogic exercises except their routine. The dependent variables selected for this study FVC and RPR were measured with the help of a spirometer and radial pulse method respectively. All the subjects were tested at baseline (pre-test) and after 6 weeks of yogic exercises for post-test scores on forced vital capacity and resting pulse rate. Random group pre-test and post-test design was used as an experimental design. Both groups were recorded for FVC and RPR at baseline and after the 6 weeks of the training period.

Training protocol

The subjects in the experimental group participated in the Yogic exercise training programme for 6 days in a week except Sunday for six weeks. The yogic exercises period was approximately 50 minutes including warming up and cool down exercises. The package of exercises such as Suryanamaskar, Asanas (trikonasana, parsarita, sirasana,

sarvangasana, ustrasana, setubandha, baddhakonasana, suptavirasana, janusirsasana, padottanasana, paschimottanasana, sarvangasana, viparitakarani, and savasana), Pranayama (anulom vilom, nadi shodhana, ujjayi, agnisara, sheetali, sheetkari, bhastrika, kapal bhati, and bhramari pranayama), Meditation and mantra chanting were given in the morning session between 6:00 am to 7:00 am.

Statistical Analysis

Statistical analyses were performed by using the statistical package for social sciences 15.0 version (SPSS). Data is expressed as the mean & SD. Dependent 't'-test was utilized to compare the means of the pre and post-test. The level of significance was set at 0.05 level of significance.

Result

The analysis of dependent 't'-test on the data obtained from the experimental and control group for FVC and RPR is analyzed and presented in Table 1 and Table 2 respectively.

Table 1: Pairwise, N, Mean, SD, SEM, and t-value of Male Undergraduate Students Belonging to the Experimental and Control Group During Pre-test and Post-test on the Forced Vital Capacity.

Group	N	Test	Mean	SD	SEM	t - Value	p - Value
Experimental Group	30	Pre-Test	4.87	0.31	0.08	8.89	0.000*
		Post-Test	5.06	0.27	0.07		
Control Group	30	Pre-Test	4.79	0.25	0.06	0.78	0.223
		Post-Test	4.82	0.29	0.07		

* Significant at 0.05 level ($p < 0.05$)

Table 1 shows the descriptive characteristics of pre-test and post-test measurements of the experimental and control group in the context of their forced vital capacity in terms of mean and standard deviation. The forced vital capacity mean & SD of the experimental group during pre-test and post-test are 4.87 & 0.31 and 5.06 & 0.27 respectively. In the control group, the forced vital capacity mean & SD during pre-test and post-test are 4.79 & 0.25 and 4.82 & 0.29 respectively. Table 1 also reveals that there is a significant difference in the experimental pre-test and post-test observations on the forced

vital capacity of male Undergraduate Students as the obtained t-value of the experimental group on forced vital capacity is 8.89 and p-value is less than 0.05 level of significance. Whereas in case of control group, pre-test and post-test observations on forced vital capacity are not found to be significant at 0.05 level of significance, as the obtained t-value of the control group is 0.78 and p-value is greater than 0.05 level of significance. The pre-test and post-test mean scores of experimental group and control group for forced vital capacity are graphically presented in Figure 1.

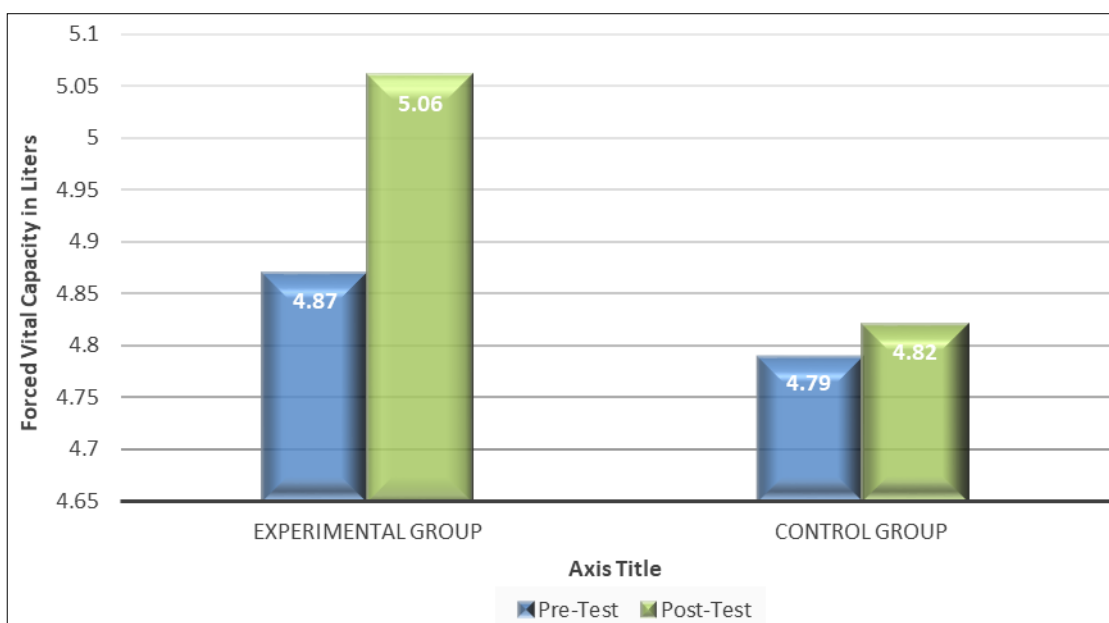


Fig 1: Mean Values of Pre-test and Post-test on the Forced Vital Capacity.

Table 2: Pairwise, N, Mean, SD, SEM, and t-value of Male Undergraduate Students Belonging to the Experimental and Control Group During Pre-test and Post-test on the Resting Pulse Rate.

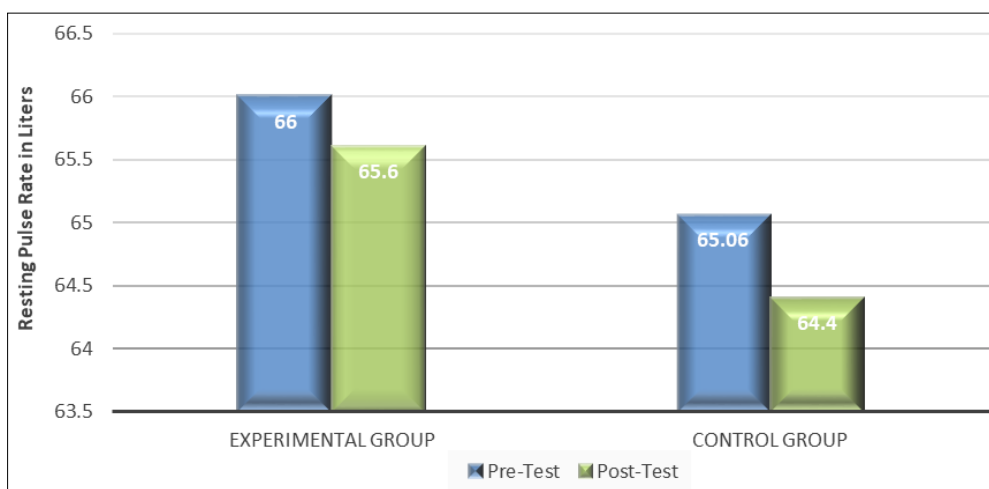
Group	N	Test	Mean	SD	SEM	t - Value	p - Value
Experimental Group	15	Pre-Test	66	3.54	0.91	1.87	.082
		Post-Test	65.6	3.48	0.89		
Control Group	15	Pre-Test	65.06	4.39	1.13	2.09	.055
		Post-Test	64.4	3.94	1.01		

* Significant at 0.05 level ($p < 0.05$)

Table 2 depicts the descriptive characteristics of pre-test and post-test measurements of the experimental and control group in the context of their resting pulse rate in terms of mean and standard deviation. The resting pulse rate mean & SD of the experimental group during pre-test and post-test are 66 & 3.54 and 65.6 & 3.48 respectively. In the control group, the resting pulse rate mean & SD during pre-test and post-test are 65.06 & 4.39 and 64.4 & 3.94 respectively.

Table 2 also reveals that there is no significant difference in the experimental pre-test and post-test observations on resting

pulse rate as the obtained t-value of the experimental group on resting pulse rate is 1.87 and the p-value is greater than 0.05 level of significance. In case of control group, the pre-test and post-test observations on resting pulse rate are also not found to be significant, as the obtained t-value of the control group is 2.09 and the p-value is greater than 0.05 level. The pre-test and post-test mean scores of the experimental group and control group for resting pulse rate are graphically presented in Figure 2.

**Fig 2**

Conclusions

In summary, the present work manifests an overriding endeavor to explore the effects of yogic exercises on forced vital capacity and resting pulse rate of undergraduate male students. The result showed a significant ($p < 0.05$) improvement in FVC with no change in RPR of the experimental group whereas there was no significant change was recorded in the control group on FVC and RPR. It concludes that even 6-week yogic exercises are effective enough on forced vital capacity in undergraduate male subjects. The daily practice of yogic exercises may help to improve the cardiac and lung health thus yogic exercises should be a part of the lifestyle of the undergraduate male students.

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