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Effect of 4-weeks yogic practice on selected physiological variables among sedentary college women

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Abstract

Yogic practices have become increasingly popular at present, as a method of coping with health problems, stress and as a means of exercise and fitness training. The purpose of the present study was to find out the effect of yogic practice on selected physiological health parameters on sedentary college women. For this purpose, a total of 15 college women students in (mean age 25.4 years) were agreed to take part as subject. Blood pressures (systolic & diastolic), resting heart rate and arterial oxygen saturation were considered as criterion in this study. All parameters were measured by the standard tools and procedures. Four weeks training was provided to the subjects and selection of yoga and training schedule was fixed by the consultation with the experts on Yoga. Descriptive and inferential statistics were used to analyzed the data and 0.05 level of significance was considered. Results revealed that no significant difference on selected parameters between pre test and post test value ($P>0.05$). It was concluded that the four weeks yogic practice have no significant effects on RHR, systolic and diastolic blood pressure and arterial oxygen saturation among sedentary college women students.

Keywords: yogic practice, resting heart rate, blood pressure, arterial oxygen saturation, sedentary women, college students.

Introduction

Yoga is an ancient Indian practice, which utilize mental and physical exercise to attain Samadhi, or the union of the individual self with the infinite. The Hatha yoga has become increasingly popular in western countries as a method of coping with stress and as a means of exercise and fitness training (Schell *et al.*, 1994) [11]. Hatha yoga was developed to promote physical health. It consist of a series of postures, called *Asanas*, and various breathing exercise called *Pranayama*, which encourage balance between the physical, mental, emotional and spiritual aspect of human being. Like other form of yoga, hatha yoga is purported to quite the mind and focus the concentration; however, all the yoga traditions, the importance of physical fitness is emphasized most in hatha yoga (Worthington, 1982) [13].

Yoga is a popular activity at present for athletes, children and seniors. Yoga can be modified to suit all levels of people for developing fitness. The efficiency of yoga on health and physical and cardio-respiratory fitness have been well proved (Madanmohan, 2011; Huang, Chien and Chung, 2013) [6, 5]. Yoga has been proven to lower blood pressure, heart rate, respiratory rate (Raub, 2002) [9] and increase strength and flexibility (Halder *et al.*, 2015) [3]. Yoga calms our minds help to reduce stress. Yoga is traditionally believed to have beneficial effects on physical and emotional health (Gilbert, 1999) [2]. The yoga practice might be interacting with varies somatic and neuro endocrine mechanism bringing about therapeutic effects. The overall performance is known to be improved by practicing yoga techniques and their effects on physical functions were reported by (Upadhyay *et al.*, 2008) [12]. Study reported that Yoga practice can also be used as psycho-physiological stimuli to increase the secretion of melatonin which in turn, might be responsible for perceived well-being and happiness (Harinath *et al.*, 2004) [4]. Yoga may be effective as or better than exercise at improving a variety of health related outcome measures (Ross and Thomas, 2010) [10]. In this background the present study was designed to find out the effect of yogic practice on selected physiological health parameters on sedentary college women students.

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Material and Methods

The Subjects

A total of 15 sedentary women students were agreed to take part in this work as subjects. All of them were regular students of a Govt. Teachers; Training College and the age of the student was in between 22 to 30 years (Mean=25.4 yrs).

Design of the Study

Single group design was adopted for this study. The group was given four weeks of Yoga Practice. The group was tested before the treatment (pre test) and again they were tested after four weeks of Yoga Practice (post test). Difference between pre test and post test mean were analyzed statistically by t-test to find out the effect of yoga treatment.

Criterion Measure

Following physiological criterion were measures in this study:

1. Blood pressure (systolic & diastolic)
2. Resting heart rate
3. Arterial Oxygen Saturation

Instruments and Tools Used

Following instruments and tools were used in this study to collect the data:

1. Sphygmomanometer & Stethoscope were used to measure Blood Pressure and Heart rate.
2. Pulse Oximeter was used to measure arterial oxygen saturation.

Training Schedule

Yoga practice was scheduled as three days per week basis for a period of twelve weeks continuously. But later it was ended after four weeks due to the serious pandemic situation. The exercise set was repeated two times for each asana in during four weeks. Duration of the exercise programmed was 40 minute per day in during the training period. The detail of schedule has presented in Table-1. Yoga training schedule was prepared with the help of the experts in the field.

Table 1: Training schedule during training period

Particular of Training	Training Schedule	Yoga Selected
Total duration	12 weeks	Om Chanting
Frequency	Monday, Wednesday and Friday	Surya Namaskara
Repeating	2 times	Padmasana, Bazrasana
Duration	40 Minutes	Yogomudrasana
Time	7.00-7.40 PM	Poschimattasana
		Usthasana
		Ardhakurmasana
		Bhujangasana
		Salvasan
		Brikhasana
		Anulom-Belom Pranayam
		Shabhasana
		End Prayer

Statistical Procedure Used

To conduct the present study single group design was adopted. Therefore descriptive and inferential statistics were

used for analyzed the data. Mean and standard deviation were used as descriptive statistics. The significance of difference between the pre test score and post test score was computed by using t-test. Only 0.05 level of significance was considered in this study. All statistical calculations have done by the standard statistical software (Excel 2010).

Result and Findings

The mean and standard deviation regarding physiological parameters - systolic blood pressure (SBP), diastolic blood pressure (DBP), Resting Heart Rate (RHR), Arterial oxygen saturation (SpO₂), body weight (BW) and three sub-contentious fat - triceps skin fold (TSF), abdominal skin fold (ASF) and supra-illiac skin fold (ISF) have been presented in Table No-2. The findings in mean difference between pre and post test of SBP and DBP have presented graphically in Figure-1. Inferential statistics for all parameters between pre and post test have also presented in Table-2. The table shown that the difference between mean values between pre test and post test for the SBP and DBP were $t = 0.46$ and $t=1.55$ respectively, and both the values were statistically insignificant ($p>0.05$).

Table 2: Presentation of analyzed data and result for physiological parameters

Parameters	Pre Test		Post Test		t-value*
	Mean	SD	Mean	SD	
SBP	111.47 mmHg	8.95	112.13 mmHg	8.46	0.46
DBP	71.93 mmHg	6.70	75.40 mmHg	5.49	1.55
RHR	78.13 bt/min	7.42	77.47 bt/min	5.22	0.28
SpO ₂	97.73 %	1.49	96.73 %	1.53	1.82

*To be significant at 0.05 level the t-value should be 2.06 at $df=28$

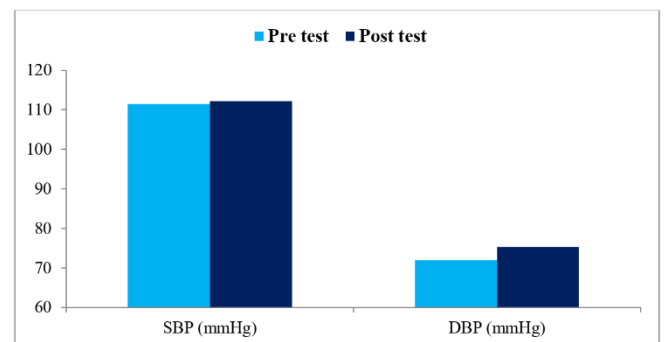


Fig 1: Graphical comparison of mean values for SBP and DBP

Table-2 also revealed that pre test mean value of RHR (78.13 beats per minute) was higher than the post test mean value (77.47 beats per minute) and the difference between mean value for pre and post tests ($t=0.28$) was not statistically significant. The mean value of RHR for pre and post test have presented graphically in Figure-2. Table-2 has shown that pre test mean value of SpO₂ were 97.73% was slightly higher than the post test mean value 96.73%. The findings has presented graphically in Figure-3. The mean difference between pre and post test ($t=1.82$) indicated that the difference was not statistically significant ($p>0.05$).

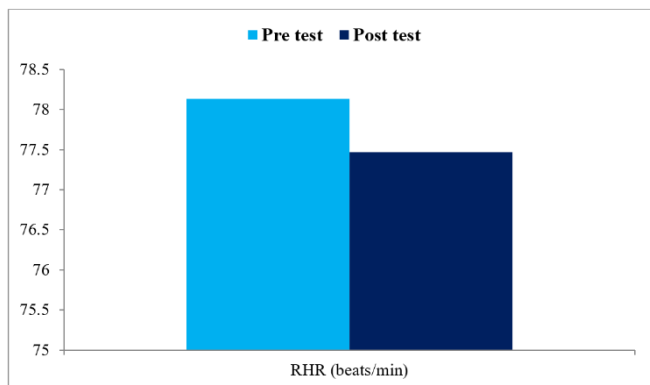


Fig 2: Graphical comparison of mean values for RHR

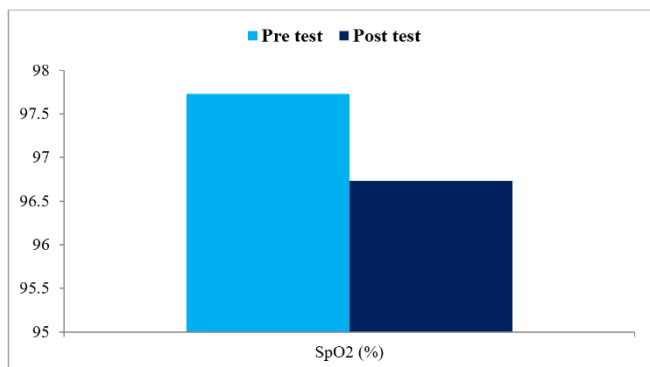


Fig 3: Graphical comparison of mean values for SpO₂

Discussion on Findings

It has been found from Table No-2 that the t-values both for the SBP and DBP were statistically not significant in this study which indicated that the four weeks of yoga practice as per the present schedule did not have significant effect on the Systolic and Diastolic blood pressure on sedentary college women. The blood pressure of the subjects was already in normal and practicing Yoga exercise might be help full for them to maintain the normal and healthy value of both systolic and diastolic blood pressure (120/80 mmHg). Mondal, Kaibarta and Sil (2016) [8] also reported that yoga is very much effective for the maintaining the BP in normal level in adult women. Another experimental study conducted by Dhara and Sil (2016) [11] also reported that six week Yoga practice had not any significant effect on blood pressure but was help full to maintain the healthy level of it. Present study found no significant improvement on SBP and DBP of the subjects which might be due to that small span of treatment of exercise. Four week span was too little to find any effect on blood pressure. Several studies conducted on this area have reported that yoga is very much effective for maintaining normal blood pressure. Present finding also supports this fact.

It has also been found that the Resting Heart Rate (RHR) of the subject was slightly lower in post test value than the pre test value. The t-value in the same table for this parameter indicated that the difference between pre and post mean value was statistically not significant ($t=0.28$; $p>0.05$). Study conducted on this field has reported that practicing yoga was help full to reduce the resting heart rate. But findings of the present study indicated that four weeks yoga training did not have significant influence on RHR among young adult women. This might be due to the fact that the RHR of the subjects was in normal and healthy zone and the yoga practice might be helped them to maintain that normal

value of RHR for this group of subject. Mondal, Kaibarta and Sil (2016) [8] reported that yoga is very much effective for the maintaining the RHR in normal level in adult women population. Another experimental study conducted by Dhara and Sil (2016) [11] also reported that six week Yoga practice had not any significant effect on RHR but was help full to maintain healthy level of it. Beside this, the short span of the Yoga treatment in present case might not be sufficient to bring the expected effect in this particular parameter on sedentary college women.

Study was designed to find out the effect of yoga practice on arterial oxygen saturation (SpO₂) among young adult women. Table-2 revealed that oxygen transport saturation (SpO₂) was slightly decreases after four weeks of yoga practice. But the t-value for this parameter indicated that the difference between pre and post training mean value was not significant statistically ($t=1.82$; $p>0.05$). This might be due to that the SpO₂ of the subjects was in normal and healthy zone and the study might not increase the value but was helped to maintain that normal value of SpO₂ in this group of subjects. Beside this, four weeks of the Yoga practice might not sufficient to bring the significant changes in this particular parameter on young adult women. Beside this, at the end of the treatment period the spread of COVID-19 was declared as pandemic and lockdown was announced. The college became closed and the training also. During post test period the psychological anxiety due to that situation might one of the causes of getting such result.

Conclusion

On the basis of above findings and discussion in this study, it was concluded that the four weeks yogic practice have no significance effects on blood pressure both systolic and diastolic, resting heart rate and arterial oxygen saturation among sedentary college women.

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