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Effect of yogic training on physiological variables of college women

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Abstract
The aim of the study was to compare the physiological variables namely resting heart rate, systolic blood pressure, diastolic blood pressure, fasting blood glucose level, post parendial blood glucose level of college women. For the purpose of the study 80 college women students were selected as the subject. The age group of the subjects was ranged from 18-21 years. They were selected randomly. The subjects were further sub-divided into two groups namely Experimental Group-1 and Control Group-2. Each group consists of 40 subjects. Physiological variables were measured through the sphygmomanometer (B.P), stethoscope (R.H.R.), blood sample collect and measured through machine in the lab, breath holding time measured through beats / minute, vo2 max measured through queens college step test. For the comparison analysis of covariance was used and the significant level was set at 0.05 level of confidence. The study revealed significant increase in resting heart rate, systolic blood pressure, diastolic blood pressure, post parendial blood glucose level. The result shows significant decrease in fasting blood glucose level, breath holding time, vo2 max the experimental groups as a result of 16 weeks progressive yogic training programme.

Keywords: Physiology, resting heart rate, systolic blood pressure, diastolic blood pressure, fasting blood glucose level, post parendial, breath holding time, Vo2 max

Introduction
Thousands of years ago yoga originated in India, and in present day and age, an alarming awareness was observed in health and natural remedies among people by yoga and pranayama which has been proven an effective method for improving health in addition to prevention and management of diseases.

Yoga is one of the most ancient cultural heritages of India. The word yoga in Sanskrit means "to unite", and so yoga can be said to connote a unitive discipline. In this sense, it is an exercise in oral and mental cultivation that generates good health (*Arogya*), contributes to longevity (*chirayu*), and the total intrinsic discipline culminates into positive and perennial happiness and peace. Therefore, yoga is the said to be indispensable to the ultimate accomplishment in life. It is a science that affects not only the conscious self but the subconscious as well. It is a practical physiological training (*Kriya yoga*), which] if practiced, can exalt man to the 'supra mundane level'.

Yoga is a discipline to improve an develop one's inherit power in a balanced Winner. It Offense the means to attain Complete Self-realization. The literal meaning of the Shakira word yoga is "yoka" yoga can therefore be defined as a means of uniting the individual spinet with the universal spinet of God. Exercise physiology is simply the study of how the body responds to physical activity. This includes anatomy. Neuromuscular function, metabolism, elements of exercise biomechanics, and more. People can practice in this field in many ways to help different clients. Exercise physiology helps professionals understand how the body works and it can help you become more physically healthy. If you're looking to amp up your physical fitness, look on further then exercise physiology.

Objective of the Study
The objective of the study was to find out the effects of Yogic training on physiological Variables of college women

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Methodology

In this section the procedure for selection of subjects, selection of variables criterion measures, experimental design, procedure for administration of tests, administration of training programme and the statistical technique employed for analysis of data have been describe.

Selection of the Subjects

For the purpose of the study eighty college women free from deformities and ailments were selected randomly from Siddhinath Mahavidyalaya, Medinipur, West Bengal. The requirements of the project were explained to the entire subject and all of them agreed voluntarily to undergo the testing and training programmes.

Selection of the variables

The research scholar had gone through both critical as well as allied literature related to the problem. Keeping in the mind, the availability of equipment's acceptability to the subjects and the legitimate time that would be devoted for test in relation to the treatment (experimental variables) requirements and to keep the entire study unitary and integrated, the following physiological variables were selected.

Physiological Variables
1. Resting heart rate
2. Systolic blood pressure
3. Diastolic blood pressure
4. Fasting blood glucose level
5. Post parendial
6. Breath holding time
7. Vo_2 max

Criterion measures

The measurement physiological variables we are measured through the Resting heart rate in terms of number of heart beats recorded per minute during resting condition, at the radial artery. Resting systolic blood pressure measured by sphygmomanometer recorded in mm/hg. Resting diastolic blood pressure measured by sphygmomanometer recorded in mm/hg. Fasting blood glucose level measured by mg /dl. Post parendial blood glucose level measured by mg /dl. Breath holding time measured by beats / minutes. Vo_2 Max measured by college queen step test. And Body composition measured by body fat percentage.

Statistical Procedure

In order to investigate the comparative effect of yogic training the analysis of covariance statistics was used. The level of significance was set at 0.05 levels.

Result of the Study

Table 1: Anova table for the resting heart rate experimental Group -1 and control group -2 during training

Source	Sum of squares	Df	Mean square	F	Sig
Pre	660.803	1	660.803	153.317	.000
Training	461.007	1	461.007	106.961	.000
Error	331.872	77	4.31		
Crected total	1603.187	79			

Shows the f-value [f (1, 77) =106.961] for comparing the adjusted means of the criterion variables in two yogic training groups (experimental group-1, experimental grup-2 and control group-3). F statistics computed for Yogic training was significant because p-value associated with it was. 000 which is less that. 05. Thus, the null hypothesis of no difference among the adjusted means for the data on criterion variable in two training groups may be rejected 5% level.

Since f- statics was significant, post-hoc comparison has been made for adjusted means of the two training groups, which is shown in table.

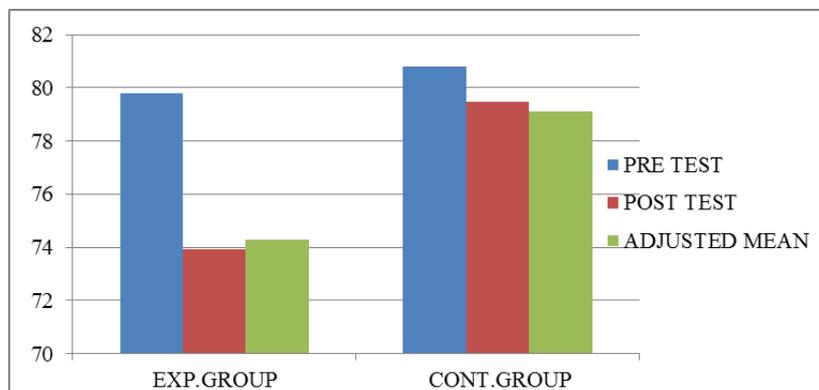| Group	Pre test mean	Post test mean	Adjusted mean
Ex.grp.1	79.78	73.93	74.27
Cont.grp.2	80.78	79.45	79.105

Resting Heart Rate

Fig 1: Pre, Post and Adjustyed Mean of the Exp.Grp-1 and Cont.Grp-2

i. There was significant difference between the adjusted means of criterion variable in experimental group -1 and Control group-2.

Table 2: Table for the systolic blood pressure experimental Group -1 and control group -2 during training

Source	Sum of squares	Df	Mean square	F	Sig
Pre	6697.81	1	6697.81	1015.73	.000
Training	870.96	1	870.96	132.083	.000
Error	507.71	77	6.59		
Crrected total	8024.75	79			

Shows the f-value [f (1, 77) =132.083] for comparing the adjusted means of the criterion variables in two yogic training groups (experimental group-1, and control group-2). F statistics computed for Yogic training was significant because p-value associated with it was. 000 which is less that. 05. Thus, the null hypothesis of no difference among the adjusted means for the data on criterion variable in two training groups may be rejected 5% level.

Since f- statics was significant, post-hoc comparison has been made for adjusted means of the two training groups, which is shown in table.

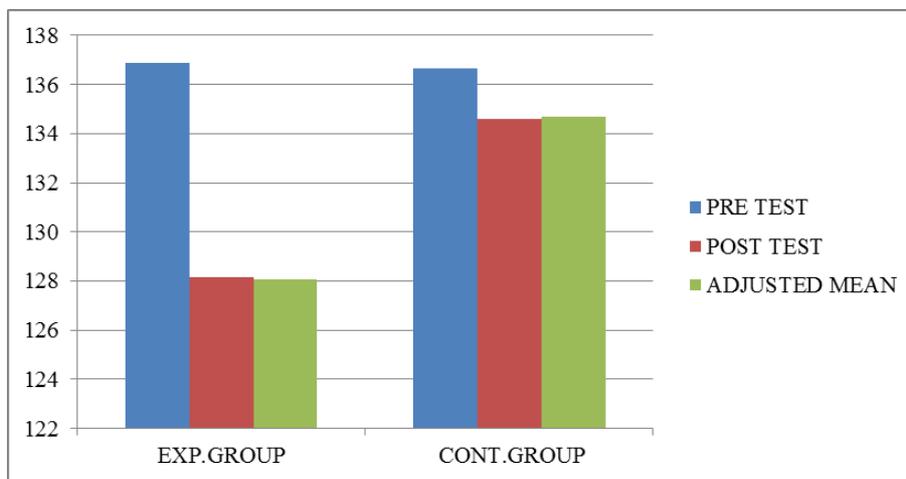| GROUP	PRE TEST MEAN	POST TEST MEAN	ADJUSTED MEAN
EX.GRP.1	136.88	128.18	128.06
CONT.GRP.2	136.65	134.58	134.67

Systolic Blood Pressure

Fig 2: Pre, Post and Adjustyed Mean of the Exp.Grp-1 and Cont.Grp-2

i There was significant difference between the adjusted means of criterion variable in experimental group -1 and Control group-2

Table 3: Anova table for the diastolic blood pressure experimental Group -1 and control group -2 during training

Source	Sum of squares	Df	Mean square	F	Sig
Pre	694.76	1	694.76	44.6	.000
Training	372.53	1	372.53	23.91	.000
Error	1199.54	77	15.58		
Crrected total	2445.55	79			

Shows the f-value [f (1, 77) =23.91] for comparing the adjusted means of the criterion variables in two yogic training groups (experimental group-1, and control group-2). F statistics computed for Yogic training was significant because p-value associated with it was. 000 which is less that. 05. Thus, the null hypothesis of no difference among the adjusted means for the data on criterion variable in two training groups may be rejected 5% level.

Since f- statics was significant, post-hoc comparison has been made for adjusted means of the two training groups, which is shown in table.

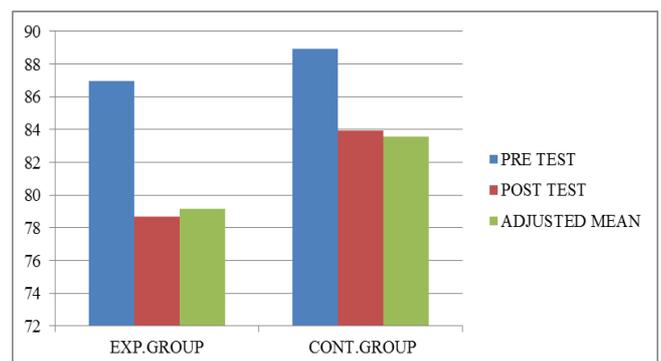| Group	Pre test mean	Post test mean	Adjusted mean
Ex.grp.1	86.95	78.70	79.14
Cont.grp.2	88.93	83.95	83.51

Diastolic Blood Pressure

Fig 3: Pre, Post and Adjustyed Mean of the Exp.Grp-1 and Cont.Grp-2

i. There was significant difference between the adjusted means of criterion variable in experimental group -1 and Control group-2

Group -1 and Control Group -2 during Training

Table 4: Anova Table for the Fasting Blood Glucose Level Experimental

Source	Sum of squares	Df	Mean square	F	Sig
Pre	23369.155	1	23369.155	4310.567	.000
Training	12.945	1	12.945	2.388	.126
Error	417.445	77	5.421		
Crrected total	23921.800	79			

Shows the f-value [f (1, 77) =2.388] for comparing the adjusted means of the criterion variables in two yogic training groups (experimental group-1, and control group-2). F statistics computed for Yogic training was significant because p-value associated with it was. 126 which is less that. 05. Thus, the null hypothesis of no difference among the adjusted means for the data on criterion variable in two training groups may be rejected 5% level. Since f- statics was significant, post-hoc comparison has been made for adjusted means of the two training groups, which is shown in table**.**

Group	Pre test mean	Post test mean	Adjusted mean
Ex.grp.1	132.95	121.25	122.15
Cont.grp.2	134.85	123.85	122.95

Fasting Blood Glucose

Fig 4: Pre, Post and Adjustyed Mean of the Exp.Grp-1 and Cont.Grp-2

i There was no significant difference between the adjusted means of criterion variable in experimental group -1 and Control group-2.

Group -1 and Control Group -2 during Training

Table 5: Anova Table for the Post-Parendial Blood Sugar Level Experimental

Source	Sum of squares	Df	Mean square	F	Sig
Pre	173429.576	1	173429.576	10054.463	.000
Training	9129.648	1	9129.648	529.285	.000
Error	1328.174	77	17.249		
Crrected total	177808.200	79			

Shows the f-value [f (1, 77) =529.285] for comparing the adjusted means of the criterion variables in two yogic training groups (experimental group-1, and control group-2). F statistics computed for Yogic training was significant because p-value associated with it was. 000 which is less that. 05. Thus, the null hypothesis of no difference among the adjusted means for the data on criterion variable in two training groups may be rejected 5% level.

Since f- statics was significant, post-hoc comparison has been made for adjusted means of the two training groups, which is shown in table**.**

Fig 5: Pre, Post and Adjustyed Mean of the Exp.Grp-1 and Cont.Grp-2

Group	Pre test mean	Post test mean	Adjusted mean
Ex.grp.1	203.9	191.68	187.116
Cont.grp.2	195.03	204.03	208.584

I) There was significant difference between the adjusted means of criterion variable in experimental group -1 and Control group-2.

Post Parendile Blood Sugar

Group -1 and Control Group -2 during Training

Table 6: Anova Table for the Breath Holding Time Experimental

Source	Sum of squares	Df	Mean square	F	Sig
Pre	3984.792	1	3984.792	182.758	.000
Training	73.726	1	73.726	3.381	.070
Error	1678.883	77	21.804		
Crrected total	5812.187	79			

Shows the f-value [f (1, 77) =3.381] for comparing the adjusted means of the criterion variables in two yogic training groups (experimental group-1, and control group-2). F statistics computed for Yogic training was significant because p-value associated with it was. 070 which is less that. 05.

Thus, the null hypothesis of no difference among the adjusted means for the data on criterion variable in two training groups may be rejected 5% level.Since f- statics was significant, post-hoc comparison has been made for adjusted means of the two training groups, which is shown in table**.**

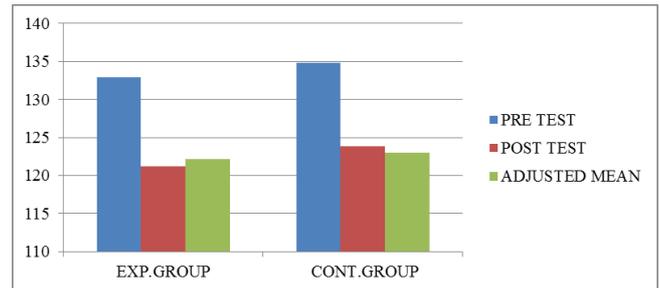| Group	Pre test mean	Post test mean	Adjusted mean
Ex.grp.1	30.63	33.55	33.15
Cont.grp.2	29.9	30.83	31.23

Breath Holding Time

Fig 6: Pre, Post and Adjustyed Mean of the Exp.Grp-1 and Cont.Grp-2

I) There was no significant difference between the adjusted means of criterion variable in experimental group -1 and Control group-2.
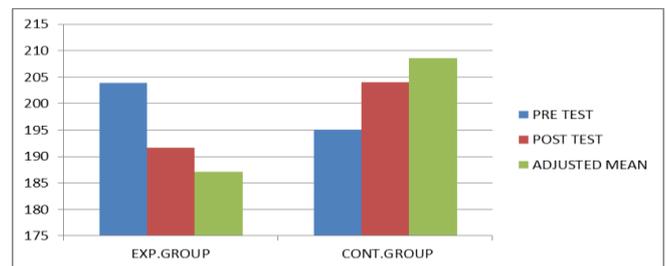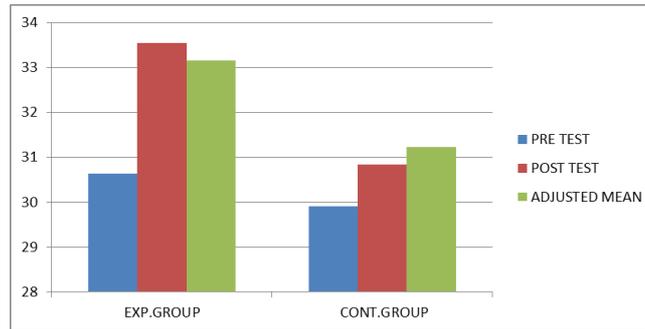
Group -1 and Control Group -2 during Training

Table 7: Anova Table for the Vo2 Max Experimental

Source	Sum of squares	Df	Mean square	F	Sig
Pre	421.542	1	421.542	213.574	.000
Training	144.096	1	144.096	73.006	.000
Error	151.979	77	1.974		
Crrected total	796.366	79			

Shows the f-value [f (1, 77) =73.006] for comparing the adjusted means of the criterion variables in two yogic training groups (experimental group-1, and control group-2). F statistics computed for Yogic training was significant because p-value associated with it was. 000 which is less that. 05. Thus, the null hypothesis of no difference among the adjusted means for the data on criterion variable in two training groups may be rejected 5% level.

Since f- statics was significant, post-hoc comparison has been made for adjusted means of the two training groups, which is shown in table.

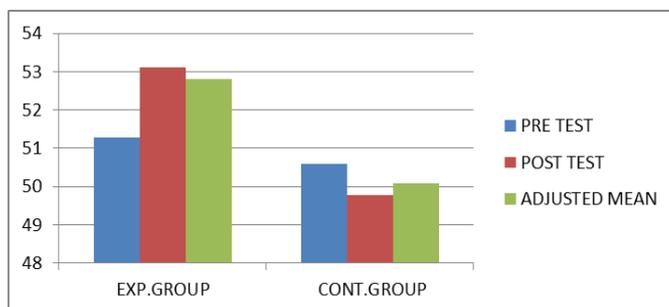| Group	Pre test mean	Post test mean	Adjusted mean
Ex.grp.1	51.27	53.11	52.796
Cont.grp.2	50.60	49.77	50.087

VO2 MAX

Fig 7: Pre, Post and Adjustyed Mean of the Exp.Grp-1 and Cont.Grp-2

I) There was significant difference between the adjusted means of criterion variable in experimental group -1 and Control group-2.

Discussion

The study revealed significant variation in the physiological variables (R.H.R, S.B.P, D.B.P, F.B.G.L, P.P, B.H.T, VO2 MAX) as a result of the 16 weeks of progressive yogic training among the college women students.

The resting heart rate of revealed significant changes in the experimental group as a result of 16 weeks of progressive yogic training.

The systolic blood pressure of revealed significant changes in the experimental group as a result of 16 weeks of progressive yogic training.

The diastolic blood pressure of revealed significant changes in the experimental group as a result of 16 weeks of progressive yogic training.

The fasting blood glucose level has shown no significant changes in the experimental group as a result of 16 weeks of progressive yogic training.

The post parendial blood glucose level of revealed significant changes in the experimental group as a result of 16 weeks of progressive yogic training.

The breath holding time has shown no significant changes in the experimental group as a result of 16 weeks of progressive yogic training.

The vo2 max has shown no significant changes in the experimental group as a result of 16 weeks of progressive yogic training.

Conclusions

On the basis of the findings of the study, the following conclusion may be drawn

The sixteen weeks of yogic training employed in the present study indicated favorable effects in increasing the Resting heart rate, systolic blood pressure, Diastolic blood pressure, post parendial blood glucose level and in decreasing fasting blood glucose level, breath holding time and vo2 max.

The sixteen weeks of yogic training employed in the present study indicated favorable effects in decreasing the body composition levels.

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