

## EFFECT OF THIRUMOOLS YOGA PRACTICES ON SELECTED PHYSIOLOGICAL VARIABLES AMONG OBESE WOMEN

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### ஆய்வுசுருக்கம்

ஆய்வின் நோக்கம் பருமனான பெண்களிடையே தேர்ந்தெடுக்கப்பட்ட உடலியல் மாறுபாடுகளில் திருமூலர் யோகா பயிற்சிகளின் விளைவை ஆராய்வதாகும். ஆய்வின் நோக்கத்தை அடைய, தமிழகத்தின் திருநெல்வேலி மாவட்டத்தில் இருந்து அறுபது பெண் பருமனான நோயாளிகள் தேர்ந்தெடுக்கப்பட்டனர். பாடங்களின் வயது 35 முதல் 50 வயது வரை இருந்தது. தேர்ந்தெடுக்கப்பட்ட பாடங்கள் குழு I (n=15) வகை I பீகார் ஸ்கூல் ஆஃப் யோகா (சுவாமி கர்மானந்தா), குழு II (n=15) என நான்கு குழுக்களாகப் பிரிக்கப்பட்டன. II திருமூலர் யோகா, குழு III (n=15) வகை I மற்றும் வகை II ஆகிய இரண்டிற்கும் உட்பட்டது மற்றும் குழு IV (n=15) கட்டுப்பாட்டு குழுவாக செயல்படுகிறது. பயிற்சிக் காலத்தின் காலம் பன்னிரண்டு வாரங்களுக்கு மட்டு பயன் படுத்தப்பட்டது மற்றும் வாரத்திற்கான அமர்வுகளின் எண்ணிக்கை மூன்று அமர்வுகள் மட்டும் நடத்தப்பட்டன. அட்டவணை பன்னிரண்டு வாரங்களுக்கு கூடுதலாக வாரத்திற்கு ஐந்து நாட்கள் முன் மற்றும் உடலியல் மாறிகளுக்கான பயிற்சிக்குப் பிறகு- குறிப்பிடத்தக்க சராசரி வேறுபாடுகளைக் கண்டறிய கோவாரியன்ஸ் பகுப்பாய்வு (ANCOVA) ஐப் பயன்படுத்தி புள்ளிவிவர சிகிச்சைக்கு. Scheffe ன் பிந்தைய தற்காலிக சோதனை, ஜோடி சராசரி வேறுபாடுகளைக் கண்டறிய பயன்படுத்தப்பட்டது. எல்லா சந்தர்ப்பங்களிலும் 0.05 என்ற நம்பிக்கை நிலை சரி செய்யப்பட்டது.

முக்கிய வார்த்தைகள்: திருமூலர் யோகா பயிற்சிகள், உடலியல், பருமனான பெண்கள்

### Abstract

The aim of this study was to investigate effect of Thirumools yogapractices on selected physiological variables among obese women. To achieve the purpose of the study, sixty female obese patients were selected from Tirunelveli District, Tamil Nadu. The age of the subjects were ranged from 35 to 50 years. The selected subjects were divided into four by groups namely Group I (n=15) underwent Type I Bihar School of Yoga (Swami Karmanandha), Group II (n=15) underwent Type II Thirumools yoga, Group III (n=15) underwent both Type I and Type II yoga and Group IV (n=15) is acted as control group. The duration of the training period was restricted to twelve weeks and the number of sessions per week was confined to three alternative days, in addition to the regular schedule twelve



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weeks with five days per week prior and after the training for physiological variables were put in-to statistical treatment using Analysis of Covariance (ANCOVA) to find out the significant mean differences. Scheffe s post hoc test was used to find out the paired mean differences. In all the cases the 0.05 level of confidence was fixed.

**Keywords: Thirumools yoga Practices,Physiological, obese women**

### Introduction

Yoga is an ancient technique practiced by sages and yogis as a desirable and healthy way of life. The very meaning of yoga is to achieve a balance within the internal and external environment, thereby seeking to attain mental, spiritual and physical well-being. This is made possible through the practice of "Pranayama" or breathing exercises, "Asana" or specific postures, and Meditation. It is thought that practicing yoga over a period of time leads to a decrease in respiratory rate, muscular relaxation along with calming of the mind, which might be interpreted at least partly as a decreased state of arousal. In contrast to the reduced physiological and metabolic activity observed during meditation and relaxation posture types of asana, pranayama and other specific asana could acutely increase the metabolic rate. An increase of 19% in oxygen consumption has been observed during the practice of one type of pranayama called the Ujjayi Pranayama.

Breathing through a particular nostril, while performing the Surya Anuloma Viloma (right nostril breathing), has been shown to increase oxygen consumption by 28% .Other specific asanas can also increase the metabolic rate transiently over the short term . The increase in oxygen consumption during these yogic practices is due the muscular activity associated with the posture assumed during the asana, or due to an increase in voluntary deep inhalation and exhalation during the pranayama. Respiratory research documents that reduced breathing rate, hovering around 5-6 breaths per minute in the average adult, can increase vagal activation leading to reduction in sympathetic activation, increased cardiac-vagal baroreflex sensitivity (BRS), and increased parasympathetic activation all of which correlated with mental and physical health. The slow breathing-induced increased tidal volume that stimulates the Hering- Breuer reflex, an inhibitory reflex triggered by stretch receptors in the lungs that feed to the vagus. Yoga, a system of mental and physical exercise techniques aimed at achieving a state of well-being in human beings, originated some 6000 years ago in India and is one of the elements of Ayurvedic medicine.

### STATEMENT OF THE PROBLEM

The purpose of the study was to find out the effect of Thirumools yoga practices on selected



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physiological, variables among obese women.

### HYPOTHESES

There would be a significant improvement on selected physiological variables such as resting heart rate and breath holding time due to the Thirumools yoga practices.

There would be a significant difference exists among four groups on the improvement of selected physiological variables such as resting heart rate and breath holding time,

### METHODOLOGY

The aim of this study was to investigate effect of Thirumools yoga practices on selected physiological variables among obese women. To achieve the purpose of the study, sixty female obese patients were selected from Tirunelveli District, Tamil Nadu. The age of the subjects were ranged from 35 to 50 years. The selected subjects were divided into four groups namely Group I (n=15) underwent Type I Bihar School of Yoga (Swami Karmanandha), Group II (n=15) underwent Type II Thirumools yoga, Group III (n=15) underwent both Type I and Type II yoga and Group IV (n=15) is acted as control group. The duration of the training period was restricted to twelve weeks and the number of sessions per week was confined to three alternative days, in addition to the regular schedule twelve weeks with five days per week prior and after the training for physiological variables were put in-to statistical treatment using Analysis of Covariance (ANCOVA) to find out the significant mean differences. Scheffe's post hoc test was used to find out the paired mean differences. In all the cases the 0.05 level of confidence was fixed.

### Results of Resting Heart Rate

The analysis of dependent 't'-test on the data obtained for resting heart rate of the pre-test and post-test means of yogic practices and control groups have been analyzed and presented in table :1

**MEANS, STANDARD DEVIATION AND DEPENDENT 't' TEST VALUES ON RESTING HEART RATE OF EXPERIMENTAL AND CONTROL GROUPS**

Tests	Group I Type I Yoga Practice		Group II Type II Yoga Practice		Group III Combined (Type I & II) Yoga Practice		Group IV Control Group	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pre test	81.33	2.38	82.53	2.53	81.44	2.71	82.20	2.11
Post test	77.40	2.56	78.53	2.50	75.81	1.97	82.93	2.28
T-Test	10.60*		10.25*		10.15*		1.34	



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\*Significant at .05 level. The Table Value required at .05 level with df 14 is 2.14.

From the table, the obtained t-test value of Type I Yoga Practice group, Type II Yoga Practice group and Combined (Type I & II) Yoga Practice group are 10.60, 10.25 and 10.15 respectively which are greater than the tabulated t-value of 2.14 with df 14 at .05 level of confidence.

This means that the Type I Yoga Practice group, Type II Yoga Practice group and Combined (Type I & II) Yoga Practice group had effects on participants' resting heart rate. However, control group did not show any significant improvement on participants' resting heart rate because they were not underwent any special training.

Figure I illustrate the pre and post test means of Type I Yoga ,Practice group, Type II Yoga Practice group, Combined (Type I & II),Yoga Practice group and control group on resting heart rate of obese women.

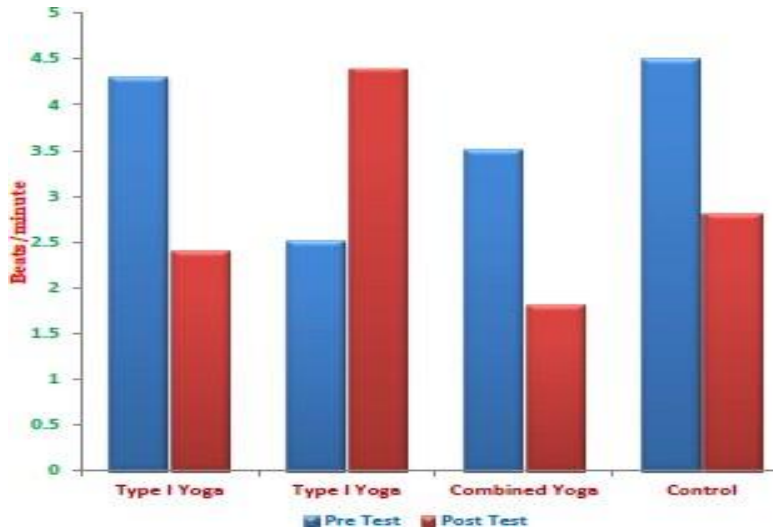


FIGURE I : MEAN VALUES OF PRE AND POST TESTS TYPE I

YOGA PRACTICE GROUP, TYPE II YOGA PRACTICE GROUP, COMBINED (TYPE I & II), YOGA PRACTICE GROUP AND CONTROL GROUP ON RESTING HEART RATE.

Table 2 presents the results of the univariate ANCOVA Tests on resting heart rate of experimental and control groups

Table 2

RESULTS OF ANALYSIS OF COVARIANCE ON RESTING HEART RATE AMONG EXPERIMENTAL AND CONTROL GROUPS



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Adjusted Post Test Means				Sources Of Variance	Sum of Square	df	Mean Squares	F-ratio
Group I Type I Yoga Practice	Group II Type II Yoga Practice	Group III Combined (Type I & II) Yoga Practice	Group IV Control Group					
77.81	78.11	75.89	82.74	Between	377.05	3	125.68	48.12*
				Within	143.67	55	2.61	

\*Significant at .05 level. The Table value required at .05 level withdf 3 & 55 is 2.77.

The obtained F-ratio value is 48.12, which is higher than the table value 2.77 with df 3 and 55 required for significance at .05 level. Since the value of F-ratio is higher than the table value, it indicates that there was significant difference among the adjusted post-test means Type I Yoga Practice group, Type II Yoga Practice group, Combined (Type I & II) Yoga Practice group and control group. To find out which of the six paired means had a significant difference, the Scheffe's post-hoc test was applied and the results are presented in Table 3.

**Table 3 Scheffe's Test for The Differences Between The adjusted post test paired means of Resting heart rate**

Adjusted Post Test Mean				Mean Differences	Confidence Interval
Group I Type I Yoga Practice	Group II Type II Yoga Practice	Group III Combined (Type I & II) Yoga Practice	Group IV Control Group		
77.81	78.11			0.30	1.70
77.81		75.89		1.92*	
77.81			82.74	4.93*	
	78.11	75.89		2.22*	
	78.11		82.74	4.63*	
		75.89	82.74	6.85*	

\*Significant at .05 level.

Table above shows that the adjusted post test mean differences on resting heart rate between Type I Yoga Practice and Combined (Type I & II) Yoga Practice groups; Type I Yoga Practice and control groups; Type II Yoga Practice and Combined (Type I & II) Yoga Practice groups; Type II Yoga Practice and control groups; and Combined (Type I & II) Yoga Practice and control groups are 1.92,



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4.93, 2.22, 4.63 and 6.85 which are greater than the confidence interval value 1.70, which shows significant difference at .05 level of confidence. It may be concluded from the results of the study that there was a significant difference on resting heart rate between Type I Yoga Practice and Combined (Type I & II) Yoga Practice groups; Type I Yoga Practice and control groups; Type II Yoga Practice and Combined (Type I & II) Yoga Practice groups; Type II Yoga Practice and control groups; and Combined (Type I & II) Yoga Practice and control groups. It was concluded that Combined (Type I & II) Yoga Practice groups is better than Type I Yoga Practice, Type II Yoga Practice and control groups in improving resting heart rate.

Figure II illustrates the adjusted post test means of experimental and control groups on resting heart rate among obese women.

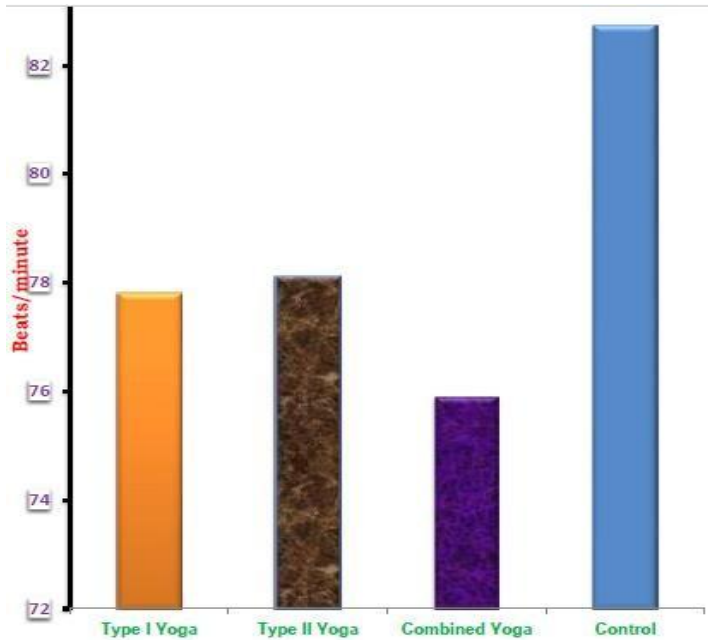


FIGURE II : ADJUSTED POST TEST MEAN VALUES OF TYPE I YOGA PRACTICE GROUP, TYPE II YOGA PRACTICE GROUP, COMBINED (TYPE I & II) YOGA PRACTICE GROUP AND CONTROL GROUP ON RESTING HEART RATE.

#### Results of Breath holding time

The analysis of dependent  $t$ -test on the data obtained for breath holding time of the pre-test and post-test means of yogic practices and control groups have been analyzed and presented in table 4.

MEANS, STANDARD DEVIATION AND DEPENDENT  $t$  TEST VALUES ON BREATH HOLDING TIME OF EXPERIMENTAL AND CONTROL GROUPS



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Tests	Group I Type I Yoga Practice		Group II Type II Yoga Practice		Group III Combined (Type I & II) Yoga Practice		Group IV Control Group	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Pre test	44.33	7.46	44.93	4.85	49.12	6.76	45.40	5.77
Post test	48.80	5.99	48.40	3.76	56.56	6.09	45.67	5.58
T-Test	7.25*		4.05*		8.59*		0.21	

\*Significant at .05 level. The Table Value required at .05 level with df 14 is 2.14.

From the table, the obtained t-test value of Type I Yoga Practice group, Type II Yoga Practice group and Combined (Type I & II) Yoga Practice group are 7.25, 4.05 and 8.59 respectively which are greater than the tabulated t-value of 2.14 with df 14 at .05 level of confidence. This means that the Type I Yoga Practice group, Type II Yoga Practice group and Combined (Type I & II) Yoga Practice group had effects on participants' breath holding time. However, control group did not show any significant improvement on participants' breath holding time because they were not underwent any special training. Figure III illustrate the pre and post test means of Type I Yoga Practice group, Type II Yoga Practice group, Combined (Type I & II) Yoga Practice group and control group on breath holding time of obese women.

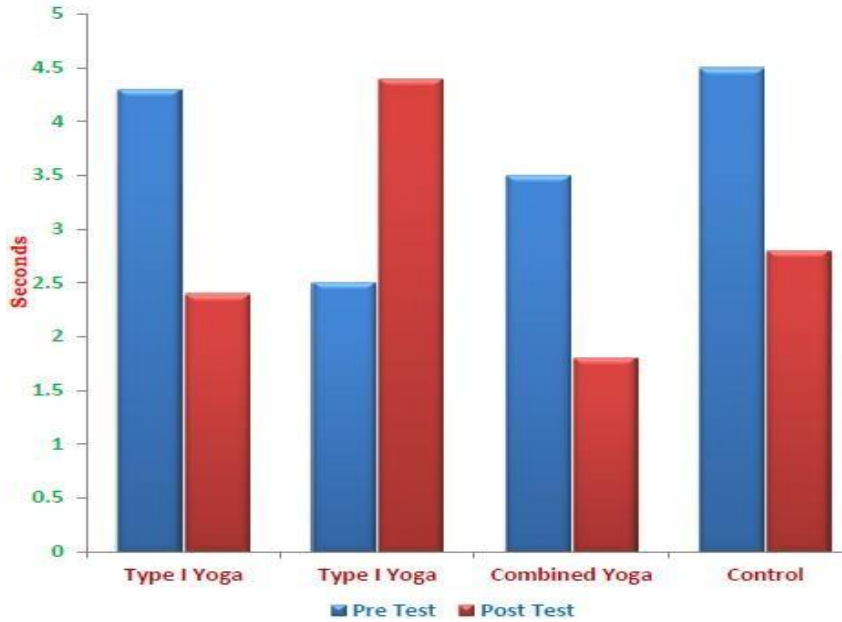


FIGURE III: MEAN VALUES OF PRE AND POST TESTS TYPE I YOGA PRACTICE GROUP, TYPE



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**II YOGA PRACTICE GROUP, COMBINED (TYPE I & II) YOGA PRACTICE GROUP AND CONTROL GROUP ON BREATH HOLDING TIME.**

Table 5 presents the results of the univariate ANCOVA tests on breath holding time of experimental and control groups

**Table 5**

**RESULTS OF ANALYSIS OF COVARIANCE ON BREATH HOLDING TIME AMONG EXPERIMENTAL AND CONTROL GROUPS**

Adjusted Post Test Means				Sources Of Variance	Sum of Square	df	Mean Squares	F-ratio
Group I Type I Yoga Practice	Group II Type II Yoga Practice	Group III Combined (Type I & II) Yoga Practice	Group IV Control Group					
50.05	49.23	54.69	45.18	Between	514.575	3	171.525	14.25*
				Within	547.012	55	9.95	

\*Significant at .05 level. The Table value required at .05 level with df 3 & 55 is 2.77.

The obtained F-ratio value is 14.25, which is higher than the table value 2.77 with df 3 and 55 required for significance at .05 level. Since the value of F-ratio is higher than the table

value, it indicates that there was significant difference among the adjusted post-test means Type I Yoga Practice group, Type II Yoga Practice group, Combined (Type I & II) Yoga Practice group and control group. To find out which of the six paired means had a significant difference, the Scheffe's post-hoc test was applied and the results are presented in Table 6.

**Table 6**

**SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POST TEST PAIRED MEANS OF BREATH HOLDING TIME**





Adjusted Post Test Mean				Mean Differences	Confidence Interval
Group I Type I Yoga Practice	Group II Type II Yoga Practice	Group III Combined (Type I & II) Yoga Practice	Group IV Control Group		
50.05	49.23			0.82	3.32
50.05		54.68		4.63*	
50.05			45.18	4.87*	
	49.23	54.68		5.45*	
	49.23		45.18	4.05*	
		54.68	45.18	9.50*	

\*Significant at .05 level.

Table above shows that the adjusted post test mean differences on breath holding time between Type I Yoga Practice and Combined (Type I & II) Yoga Practice groups; Type I Yoga Practice and control groups; Type II Yoga Practice and Combined (Type I & II) Yoga Practice groups; Type II Yoga Practice and control groups and Combined (Type I & II) Yoga Practice and control groups are 4.63, 3.87, 8.45, 4.05 and 8.50 which are greater than the confidence interval value 3.32, which shows significant difference at .05 level of confidence. It may be concluded from the results of the study that there was a significant difference on breath holding time between Type I Yoga Practice and Type II Yoga Practice groups; Type I Yoga Practice and Combined (Type I & II) Yoga Practice groups; Type I Yoga Practice and control groups; Type II Yoga Practice; Type II Yoga Practice and control groups and Combined (Type I & II) Yoga Practice groups; Type II Yoga Practice and control groups; and Combined (Type I & II) Yoga Practice and control groups. It was concluded that Combined (Type I & II) Yoga Practice groups is better than Type I Yoga Practice, Type II Yoga Practice and control groups in improving breath holding time.

Figure IV illustrates the adjusted post test means of experimental and control groups on breath holding time among obese men



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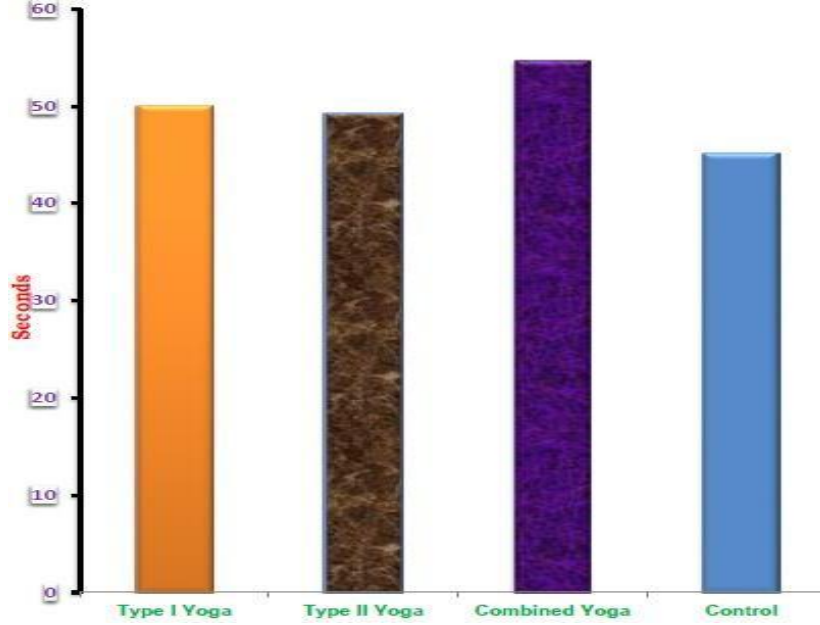


FIGURE IV: ADJUSTED POST TEST MEAN VALUES OF TYPE I YOGA PRACTICE GROUP, TYPE II YOGA PRACTICE GROUP, COMBINED (TYPE I & II) YOGA PRACTICE GROUP AND CONTROL GROUP ON BREATH HOLDING TIME.

## CONCLUSIONS

Group I yoga practices (Bihar School of Yoga) had significantly improved the selected physiological variables namely resting pulse rate, and breath holding time among obese women.

Group II yoga practices (Thirumools yoga ) had significantly improved the selected physiological variables namely resting pulse rate, and breath holding time among obese women.

The Combined (Group I & II) yoga practices had significantly improved the selected physiological variables namely resting pulse rate and breath holding time among obese women.

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