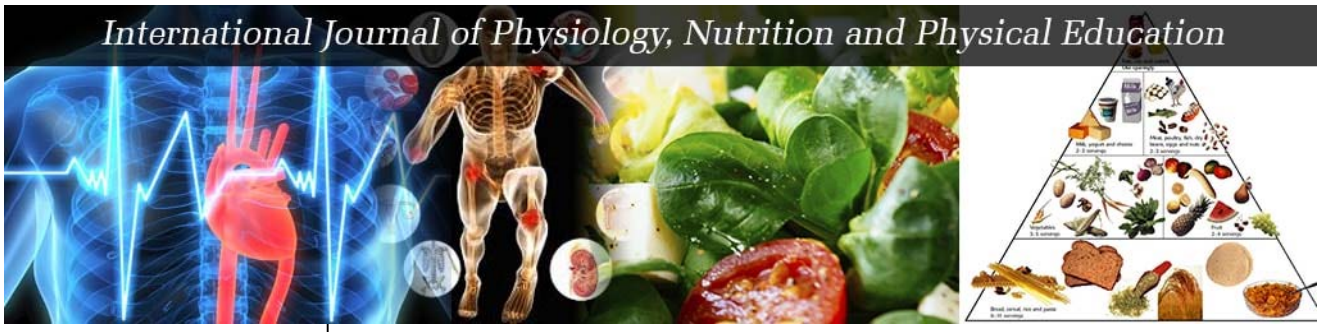

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Effect of yogic practices on the selected physiological variables among the middle aged men

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Abstract
The present study is to analyze the effect of Yogic practices on the selected physiological variables among the middle aged men. For this study 100 middle age male persons were selected from Yazh Yoga Coimbatore city, after the scrutiny by the scholar and experts 30 middle aged men were selected as subjects by adopting purposive random sampling technique. The age of the subjects ranged from 35 to 45 years. They were divided into two equal groups namely, the group were assigned Asana, Pranayama, Meditation (APMTG) and Control group (CG). The subjects were tested to find out the Resting Pulse Rate, Vital Capacity and Blood Pressure. The pulse rate was assessed by arterial pulse, vital capacity was measured by digital Spiro meter and blood pressure was measured by sphygmomanometer. The Asana, Pranayama, Meditation(APMTG) Yoga group participated in Yogic practices for a period of twelve weeks and control group did not participate in any special practice. The data were collected before and after the training period and the pretest, post-test and the adjusted post-test were analyzed by Analysis of Covariance (ANCOVA). The level of significance for the study was chosen as 0.05. It is concluded from the results that the APMTG group has significant improvement in resting pulse rate, vital capacity and blood pressure among middle aged men.

Keywords: Resting pulse rate, vital capacity, blood pressure

1. Introduction
Yoga refers to traditional physical and mental disciplines originating in India. The word is associated with meditative practices in Hinduism, Buddhism and Jainism. Within Hinduism, it also refers to one of the six orthodox (āstika) schools of Hindu philosophy, and to the goal towards which that school directs its practices. Major branches of yoga in Hindu philosophy include Rāja Yoga, Karma Yoga, Jnana Yoga, Bhakti Yoga, and Hatha Yoga. Hatha Yoga has become increasingly popular in western countries as a method for coping with stress and as a means of exercise and fitness training (Schell *et al*; 1994). Hatha yoga is an ancient practice that was developed to promote physical and Physiological health as well as an awareness of one's true nature. It consists of a series of postures, called Asanas, and various breathing exercises, called Pranayama, which encourage balance between the physical, mental, emotional, and spiritual aspects of a human being.

1.1 Statement of the Problems
The present study was to analyze the effect of Yogic practices on the selected physiological variables among the middle aged men

1.2 Hypotheses
This study were hypothesized in the following ways
It was hypothesized that there were significant improvement on the selected physiological variables through Asana, Pranayama, and Meditation Training among middle age peoples

2. Methods and Procedure Selection of Subjects
Thirty middle aged men selected as subjects by adopting purposive random sampling Technique and they were selected from IT and Non IT Industries Coimbatore city. The age of the subjects were ranged from 35 to 45 years.

2.1 Experimental Design

For this study 100 middle age male persons were selected from Yazh Yoga Coimbatore city, after the scrutiny by the scholars and experts 30 middle aged men were selected as subjects by adopting purposive random sampling technique. The age of the subjects ranged from 35 to 45 years. They were divided into two equal groups namely, The Asana, Pranayama, Meditation (APMTG) Yoga group and Control group (CG). The subjects were tested to find out the resting pulse rate, vital capacity and blood pressure. The pulse rate was assessed by arterial pulse, vital capacity was measured by digital Spiro meter and blood pressure was measured by sphygmomanometer. The Asana, Pranayama, Meditation (APMTG) Yoga Group participated in Yogic practices for the period of twelve weeks and Control group did not participate in any special practice. The data were collected before and after the training period and the pretest, post-test and the adjusted post-test were analyzed by Analysis of Covariance (ANCOVA). The level of significance for the study was chosen as 0.05

2.2 Selection of variables and test

Measurements were made during the weeks prior to and immediately following the 12 week training programme. All procedures were demonstrated prior of testing.

Stethoscope is used to find out the resting heart rate. The heartbeat of the individual is measured with the earphones of the stethoscope placed in the tester's ears, the bell of the stethoscope would be placed on the radial pulse, so that one could measure his own heartbeat. Pulse rate was measured for one minute.

Spirometer is used to measure the vital capacity. Helios 401 is a spirometer which is used in conjunction with a Windows based computer. It has a hand piece which houses a turbine transducer. This hand piece is connected to a computer through a USB interface cable. The software given along with the system is used to record spirometry maneuvers and to suggest a diagnosis. The computer monitor is used to display the spirometry parameters, the device parameters, information messages and user guide messages. A printer attached to the computer can be used to obtain a hard-copy record of the maneuver and the related parameter values. The helios spirometer was placed at a height that allow the subject to stand erect at the beginning of the test. The subject forcefully inhaled and exhaled twice before the test. The subject was cautioned not to allow air to escape through a nose or around the mouth piece. The subject at completion should bend slightly forward to blow as much air as possible in to the spirometer. The reading is shown in the Helios spirometer graph and the result was recorded as a score.

Sphygmomanometer is used to find out the blood pressure. The method has used to measure the systolic and diastolic blood pressure is relatively simple. The cuff of the sphygmomanometer is wrapped around the forearm above the elbow, with earphones of the stethoscope in the tester's ears; the bell of the stethoscope has placed on the bronchial artery just above the hollow of the elbow. The cuff has pumped up until the artery collapsed, which is no pulse beat could be heard. Pressure has been then slowly released as the tester watched the gauge or mercury column. When the first sound of the pulse has heard, the reading in millimeters of mercury at that instant has recorded as systolic blood pressure. The tester has continued, to release pressure slowly until a very dull, weak beat has noted. At that time the pressure in millimeters of mercury is noted as diastolic pressure. The measure has recorded with the systolic blood pressure first and the diastolic blood pressure later. The blood pressure was measured in millimeters of mercury (mmHg).

2.3 Training Programme

The Asana, Pranayama, Meditation (APMTG) Yoga Group practice was given for five days per week, from 6.00 am to 7.00 am for 12 weeks. Each yoga session consisted of 1 hour of Yoga practices. The Asana, Pranayama, Meditation (APMTG) Yoga Group practices Consisted of Trikonasana, Halasana, Padahastasana, Chakrasana, Vrikshasana, Sarvangasana, Pachimottasana, Savasana, Vajrasana, Ardha Matsyendrasana, Shalabasana, Pawan Muktasana, Garudasana, Nadis uddi Bhastrika Pranayama, Anulomvilom, Kapalbhati, Udgeeth pranayam, Mindfulness mediation Although individual yoga techniques are universally standard, various exercises, sequences and duration of each movement are dependent on individual instructors. Whereas the yoga protocols were practiced in their ability, only a limited number of Yoga was completed at each Yoga Session. The subjects were beginners in the practice of Yoga poses were introduced in this study. The subjects were encouraged to do all exercises as accurately as possible.

3. Result

Analysis of covariance was applied to determine whether the training programmes produced significantly different improvements in Resting Pulse Rate, Vital Capacity and Blood Pressure among The Asana, Pranayama, Meditation (APMTG) Group and Control Group (CG). The analysis is presented in the following tables.

Table I: Computation of Analysis of Covariance of Apmtg Yogic Practice Group and Control Group on Resting Pulse Rate

	APMTG Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Means	78.35	78.7	BG	1.23	1.00	1.22	0.23
			WG	200.75	38.00	5.28	
Post-Test Means	72.5	78.7	BG	291.60	1.00	291.60	66.43*
			WG	166.80	38.00	4.38	
Adjusted Post-Test Means	72.59	77.8	BG	268.90	1.00	268.90	97.37*
			WG	102.17	37.00	2.76	

Significant, BG- Between Group Means, WG- Within Group Means, df- Degrees of Freedom, Table Value for 0.05 level for df 1& 38 = 4.09 and 1 & 37 = 4.10

An examination of table – I indicates that the results of ANCOVA for the pretest scores of the Asana, Pranayama, Meditation (APMTG) Yoga Group and Control group. The obtained F- ratio for the pre-test is 0.23 (P>0.05) indicating that the random sampling is successful and the table F-value is 4.10. Hence the pre-test mean F-ratio is insignificant at 0.05 level of confidence for the degree of freedom 1 and 38. The obtained F-Value for the post-test is 66.43 (P<0.05) and the table F-value is 4.10. Hence the post-test mean F-ratio is significant at 0.05 level of confidence for the degree of

freedom 1 and 38. The adjusted the post-test means of The Asana, Pranayama, Meditation (APMTG) Yoga Practice Group and Control Group are 72.59 and
77.80 Respectively. The obtained F-ratio for the adjusted post-test means is 97.37 (P<0.05) and the table F-Value is 4.11. Hence the adjusted post-test mean resting pulse rate F-ratio is significant at 0.05 level of confidence for the degree of freedom 1 and 37. The Pretest, post-test and adjusted post-test mean difference of the Asana, Pranayama, Meditation (APMTG) Yoga Group practice group and Control Group on resting pulse rate are presented in Figure I.

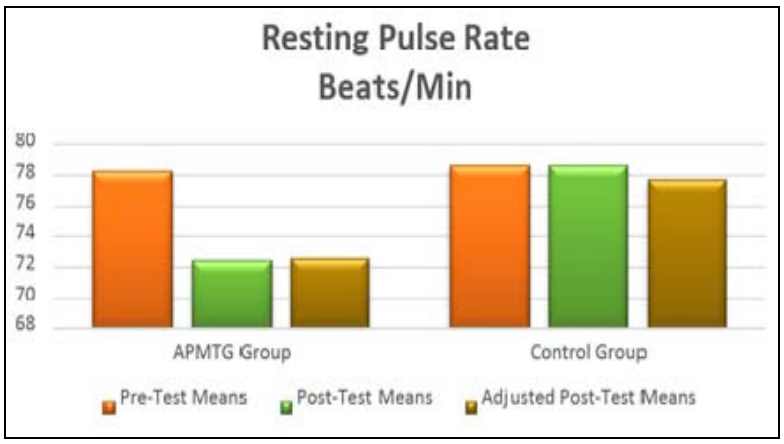

Fig I: Bar diagram showing the pretest, post-test and adjusted post-test mean differences of The Asana, Pranayama, Meditation (APMTG) Yoga Practice Group and Control Group on resting pulse rate

Table II: Computation of Analysis of Covariance of Apmtg Yoga Practice Group and Control Group on Systolic Blood Pressure

	APMTG Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	F- ratio
Pre-Test Means	124.2	124.55	BG	1.22	1.00	1.22	0.03
			WG	1434.15	38.00	37.74	
Post-Test Means	120.95	124.3	BG	112.22	1.00	112.22	4.31*
			WG	989.15	38.00	26.03	
Adjusted Post-Test Means	121.05	124.2	BG	99.27	1.00	99.27	6.92*
			WG	530.64	37.00	14.34	

An examination of table – II indicates that the results of ANCOVA for the pretest scores of
The Asana, Pranayama, Meditation (APMTG) Yoga Practice Group and Control group. The obtained F-ratio for the pre-test is 0.03 (P>0.05) indicating that the random sampling is successful and the table F-value is 4.10. Hence the pre-test mean F-ratio is insignificant at 0.05 level of confidence for the degree of freedom 1 and 38. The obtained F-ratio for the post-test is
4.31 (P<0.05) and the table F-value is 4.10. Hence the post-test mean F-ratio is significant at
0.05 level of confidence for the degree of freedom 1 and 38. The adjusted post-test means of the
Asana, Pranayama, Meditation (APMTG) Yoga Group and Control group are
121.05and124.20respectively. the obtained F-ratio for the adjusted post-test means is 6.92 (P<0.05) and the table F-ratio is 4.11. Hence the adjusted post-test mean systolic blood pressure F- ratio is significant at 0.05 level of confidence for the degree of freedom 1 and 37. Pretest, post-test and adjusted post-test mean difference of the Asana, Pranayama, Meditation (APMTG) Yoga Group and Control group on Systolic blood pressure is presented in Figure II.

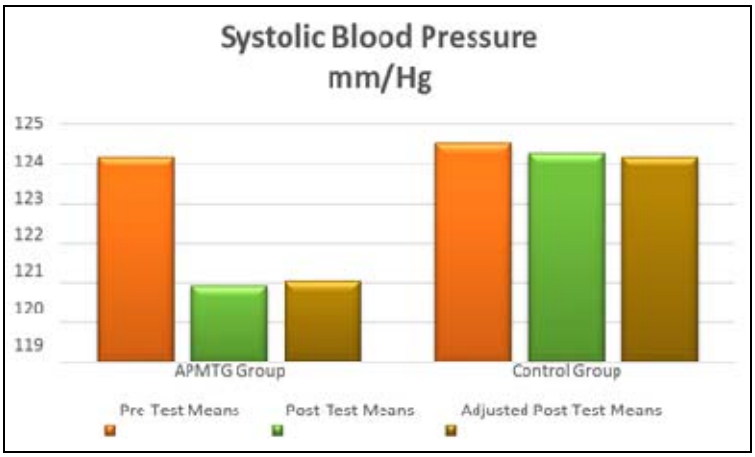

Fig II: Bar diagram showing the pretest, post-test and adjusted post-test mean differences of The Asana, Pranayama, Meditation (APMTG) Yoga Group and Control group on Systolic blood pressure

Table III: Computation of Analysis of Covariance of Apmtg Yoga Group and Control Group on Diastolic Blood Pressure

	APMTG Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Means	86.7	85.9	BG	6.40	1.00	6.40	0.90
			WG	270.00	38.00	7.10	
Post-Test Means	81.5	85.2	BG	136.90	1.00	136.90	28.24*
			WG	184.20	38.00	4.84	
Adjusted Post- test Means	81.37	85.32	BG	153.10	1.00	153.10	36.33*
			WG	155.90	37.00	4.21	

An examination of table – III indicates that the results of ANCOVA for pretest scores of the Asana, Pranayama, Meditation (APMTG) Yoga Group and Control group. The obtained F- ratio for the pre-test is 0.90 (P>0.05) indicating that the random sampling is successful and the table F-Value is 4.10. Hence the pre-test mean F-ratio is insignificant at 0.05 level of confidence for the degree of freedom 1 and 38. The obtained F-ratio for the post-test is 28.24 (P<0.05) and the table F-value is 4.10. Hence the post-test mean F-ratio is significant at 0.05 level of confidence for the degree of freedom 1 and 38. The adjusted post-test means of The Asana, Pranayama, and Meditation (APMTG) Yoga Group and Control group are
81.37and85.32respectively. the obtained F-ratio for the adjusted post-test means is 36.33 (P<0.05) and the table F-value is 4.11. Hence the adjusted post-test mean Diastolic blood pressure F- ratio is significant at 0.05 level of confidence for the degree of freedom 1 and 37. Pretest, post-test and adjusted post-test mean difference of the Asana, Pranayama, Meditation (APMTG) Yoga Group and Control group on Diastolic blood pressure is presented in Figure III.

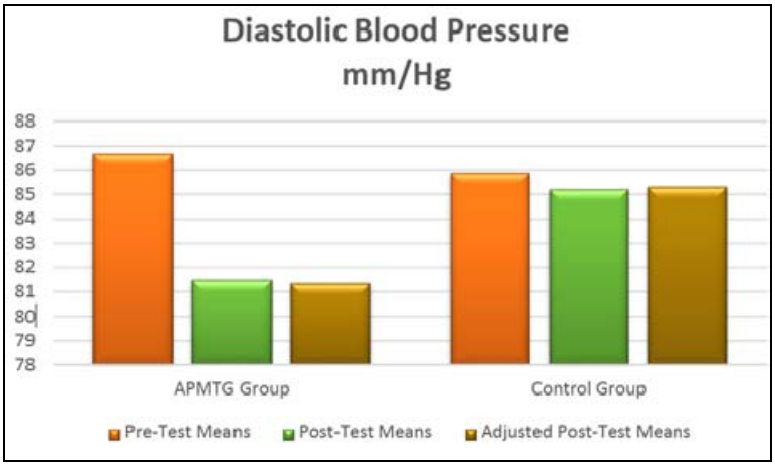

Fig III: Bar diagram showing the pre-test, post-test and adjusted post-test mean differences of The Asana, Pranayama, Meditation (APMTG) Yoga Group and Control Group on diastolic blood pressure

Table IV: Computation of Analysis of Covariance of Apmtg Yoga Group and Control Group on Vital Capacity

	APMTG Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Means	3355	3320	BG	12250.00	1.00	12250.00	0.16
			WG	2881500.00	38.00	75828.94	
Post-Test Means	3585	3350	BG	552250.00	1.00	552250.00	8.83*
			WG	2375500.00	38.00	62513.15	
Adjusted Post-Test Means	3570.14	3364.86	BG	419630.00	1.00	419630.00	52.04*
			WG	298331.00	37.00	8063.00	

An examination of table – IV indicates that the results of ANCOVA for pretest scores of The Asana, Pranayama, Meditation (APMTG) Yoga group and control group. The obtained F- ratio for the pre-test is 0.16 (P>0.05) indicating that the random sampling is successful and the table F-Value is 4.10. Hence the pre-test mean F-ratio is insignificant at 0.05 level of confidence for the degree of freedom 1 and 38. The obtained F-ratio for the post-test is 8.83 (P<0.05) and the table F-Value is 4.10. Hence the post-test mean F-ratio is significant at 0.05 level of confidence for the degree of freedom 1 and 38. The adjusted post-test means of The Asana, Pranayama, Meditation (APMTG) Yoga group and control group are 3570.14 and
3364.86 Respectively. The obtained F-ratio for the adjusted post-test means is 52.04 (P<0.05) and the table F-Value is 4.11. Hence the adjusted post-test mean vital capacity F-ratio is significant at 0.05 level of confidence for the degree of freedom 1and 37. Pretest, post-test and adjusted post-test mean difference of the Asana, Pranayama, Meditation (APMTG) Yoga group and control group on vital capacity is presented in Figure IV.

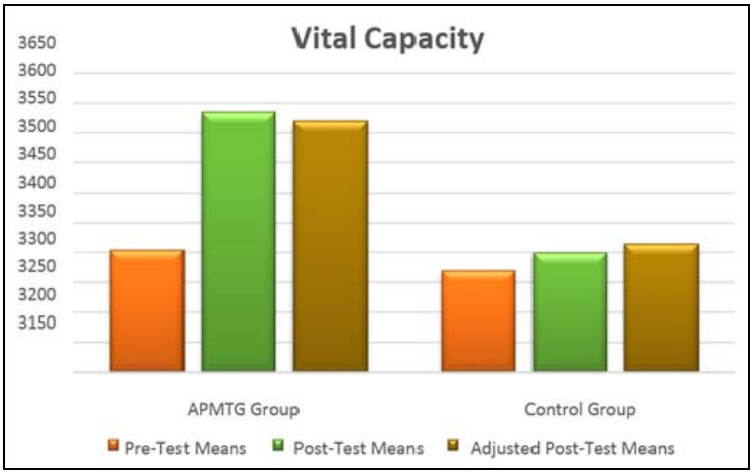

Fig IV: Bar diagram showing the pretest, post-test and adjusted post-test mean differences of The Asana, Pranayama, Meditation (APMTG) Yoga Group and Control group on Vital capacity

4. Discussion on Findings

This study shows that twelve weeks of Asana, Pranayama, and Meditation (APMTG) Yoga group has significant benefits in improving the Resting pulse rate and Blood pressure, Vital capacity. Our results indicate that The Asana, Pranayama, Meditation (APMTG) Yoga Group increased significantly on Resting pulse rate (Table I), Systolic blood pressure (Table II), Diastolic blood pressure (Table III) and Vital capacity (Table IV). The increase range of motion can most likely be attributed to the proper training of the yoga practices. Shenbagavalli & Divya (2010) expressed that practice of the combination of specific yogic exercises with autogenic training and specific yogic exercises programme is significantly effective in promoting desirable changes on pulse rate, and vital capacity. Jesintha & Parthiban (2007) shows that The Asana, Pranayama, Meditation (APMTG) Yoga Group significantly decreased the resting pulse rate, Systolic Blood Pressure, Diastolic Blood Pressure and significantly increased the Vital Capacity Limitation of this study includes a small sample group that consisted of a self- selected group of middle aged men subjects. Resting pulse rate, blood pressure and vital capacity showed significant improvements. Furthermore, the positive results of this study indicate that yoga is a form of physical activity that would meet the objectives of current recommendations to enhance the physiological functions.

5. Conclusions

Based on the findings the following conclusions were derived. It was proved that The Asana, Pranayama, Meditation Training Group (APMTG)Practices significantly reduced the Resting Pulse Rate and Systolic Blood Pressure, Diastolic Blood Pressure and also significantly
Improved the Vital Capacity Among Middle Age Men. It was concluded that Control Group
(CG) showed no significantly improvement.

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