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Effect of yoga on Anthropometrical and physiological variables of college going students

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Abstract

Background:-Yoga is an important role and has made unlimited Contribution in the modern age as it caters to the biological, Sociological, Spiritual and Physiological necessities of the man. The purpose of the study was to analyze the effect of Yoga on Anthropometrical and Physiological variables of the college going male students within the age group of 18-22 years.

Materials & Methods:-Total 30 subjects were taken for the study from S.B.S.S Mahavidyalaya, Goaltore, Paschim Medinipur, West Bengal. The Anthropometrical and Physiological parameters were Weight, BMI and Fat (%) & Pulse rate, S.B.P and D.B.P which were measured by the reputed physician. The Pre-test and Post-test were taken of all the parameters (Anthropometrical and Physiological) before and after of six (6) months of yoga training. The Weight and Height were measured by weighing Machine and Stadiometer respectively. They were measured for the calculation of Body Mass Index ($BMI = \text{Weight in kg}/\text{Height in meter}^2$) and for measuring the percentage of Body Fat, Skin Fold Caliper was used. Similarly, the physiological parameters were assessed by recording the blood pressure (S.B.P and D.B.P) and pulse rate before and after six (6) months of regular yogic exercise or training. The subjects were randomly selected for the study as subjects. To measure the blood pressure mercury sphygmomanometer was used and pulse Rate was recorded after a rest for 30 minutes in right radial artery by Palpatory method. For statistical analysis and Interpretation of data 't' test was conducted at 0.05 level of significance.

Results & Discussion:-The findings of the present study reveals that there were significant difference found in reduction in the pulse rate, Systolic Blood Pressure and diastolic Blood Pressure after Six (6) months of yoga practice. The mean pulse rate (beats/min) before yoga was 78.60 which reduced significantly to 72.50 after six months of yoga practice. The mean systolic blood pressure before yoga practice was (mm of Hg) 127.50 and after six months it was lowered to a highly significant level of 120.50. The mean diastolic blood pressure before yoga was 88.60 and it was reduced significantly to 80.50. Similarly, the result of Weight, BMI and Fat (%) were also significant at 0.05 level after the Six (6) months of yoga practice.

Conclusion:-On the basis of the obtained result, it has been observed that yoga practice can be used as an intervention in ageing persons to reduce the morbidity and mortality from cardiovascular diseases. It reduces the high blood pressure, pulse rate and Body Weight, BMI and Fat (%) and plays an important role in healthy impact on the life style of a man.

Keywords: Yoga, Anthropometrical and Physiological Parameters.

Introduction

Yoga plays an important role and has made unlimited Contribution in the modern age as it caters to the biological, Sociological, Spiritual and Physiological necessities of the man. The word 'yoga' is derived from the roots of Sanskrit 'Yuj' which means to join, to attach, to bind, yoke, and a concentrate or one attention. It also means Union. Yoga is true union of our will with the will have had. The literal meaning of the word 'Yoga' is 'yoke'. It means for uniting the individual spirit with the Universal spirit, or God. Yoga means the Experience of oneness or unity with inner being. It is a science by which the individual approaches truth. Yoga is not religion it is a method by which one obtain Control of one's latent powers. It is the means to reach complete Self-Realization. Yoga is a reduction of one's mental process, along with the physical.

The practice of Yoga in the Indian subcontinent has been documented as early as B.C. Regular practice of variety of Yoga techniques have been shown to lower heart rate and blood pressure in various population Lakshmikanthan *et al.* 1979^[1] and Mahajan *et al.* 1999.^[2]

All over the world scientists have extensively studied Yoga and claimed that it increases longevity Murugesan *et al.* 2000; [3] McCaffrey *et al.* 2005; [4] Nagarathan and Nagendra 2003 [5] and patel (1975), [6] It has therapeutic and rehabilitative effects (raub *et al.* 2003 [7] Schmidt *et al.* 1997 [8] and selvamurthy *et al.* 1998). [9] A short time (30-45 minutes) of regular yogic practice may give mental relief to the people. Yoga has a sound scientific basis and is an ideal tool for improving the health of our masses. Pranayama helps us to control our emotions which are linked to breathing. Pranayama also influence our pranamayakosha i.e. the vital energy sheath. Slow, deep and rhythmic breathing is ideal for controlling stress and overcoming emotional hang-ups. The practice of pranayama helps us to regulate our emotions and stabilize the mind, which has been compared to a 'drunken monkey bitten by a scorpion

Hypertension is a medical condition in which the pressure of blood pushing against the blood vessel walls is persistently high. The blood pressure is measured with an instrument called a sphygmomanometer in millimeters of mercury. The highest pressure reached during each heart beat is called systolic blood pressure and lowest between two beats is known as diastolic blood pressure. The blood pressure is considered as normal when it is 120=80 (mm of Hg). In the early 1970's, the rule of halves suggested that only half of the people who were hypersensitive were diagnosed and of those cases that were diagnosed, only half received appropriate treatment and only achieved adequate control of their blood pressure. The principle cause being increased stress and strain that we encounter in our day-to-day living (Bernardi *et al.* 2002 [10] and lyengar, 1968) [11]. One simple, inexpensive method of overcoming the stress and the consequent cardiovascular complications is the practice of Yoga. The practice of yoga in the Indian subcontinent has been documented as early as 3000 B.C. Although much research work has been done on Yoga and the cardiovascular status, most of them are in diseased conditions (khanam *et al.* 1996). [12] Physical fitness is the pre-requisite of the ability to perform any motor tasks in day to day life as well as in sport. It has been considered as one of the most important aspects of human existence. Physical fitness is that state of body in which a person can carry his daily duties and responsibilities efficiently and with the energy left he can enjoy hobbies and other recreational activities and can meet the unusual. In other words Physical fitness can be defined as the state of body in which a person can do work for a longer duration without undue fatigue. Physical fitness not only a state of younger's but is the reality for all ages.

Various research studies revealed that Participation in physical activities and various games and sports in improving the Physical fitness by lowering Percentage of Body Fat and increasing the Lean Body Mass. Physical fitness is the product of physical exercises and exercise is very much related to health and wellbeing. But development of science and technology discouraging the human beings from doing vigorous activities as a result of which various physical and mental diseases are flourishing at a great speed throughout the world. The findings of the present study will encourage the youth of the nation. The purpose of the study was to analyze the effect of Yoga on Anthropometrical and Physiological variables of the Adult male i.e in the age group of 40-45 years male.

Materials & Methods

Subjects: -Total 30 subjects were taken for the study from S.B.S.S Mahavidyalaya, Goaltore, Paschim Medinipur, west Bengal. The Anthropometrical and Physiological parameters

were Age, Height, weight, BMI and Fat (%) and Pulse Rate, S.B.P and D.B.P which were measured by reputed physian. The pre-test and post-test were taken of all the parameters (Anthropometrical and Physiological) before and after of six (6) months of yoga training. The weight was measured by weighing Machine, Height and Weight were measured for the calculation of Body Mass Index (BMI = Weight in kg/Height in meter²) and for measuring the percentage of Body Fat, Skin Fold Caliper was used. Similarly, the physiological parameters were assessed by recording the blood pressure (S.B.P and D.B.P) and pulse rate before and after six (6) months of regular yogic exercise or training. The subjects were randomly selected for the study as subjects. To measure the blood pressure mercury sphygmomanometer was used and pulse was recorded after a rest for 30 minutes in right radial artery by Placatory method. For statistical analysis and Interpretation of data 't' test was conducted at 0.05 level of significance. The random sampling method and random group design were used for the study.

Variables and Instruments:- On the basis of available literature and the researcher's own understanding the following Anthropometric and Physiological variables were selected.

They are-	i) Age	i) Pulse Rate
	ii) Height	ii) S.B.P
	iii) Weight	iii) D.B.P.
	iv) BMI	
	V) Fat (%)	

The selected Anthropometrical and Physiological variables and their measuring instruments and units of measurement are given in Table-1.

Table 1

Sl. No.	Variable	Instrument	Unit
1.	Height	Stadiometer	cm
2.	Weight	Weighing machine	kg
3.	BMI	Carat scan	Kg/m ²
4.	Fat (%)	Skin Fold Caliper	cm
5.	Pulse Rate	Palpatory Method	Beats/min
6.	S.B.P	Sphygmomanometer	Mm of Hg
7.	D.B.P	Sphygmomanometer	Mm of Hg

Procedure:-At first, the investigator were measured the following parameters before starting of yoga training programme. The Anthropometrical and Physiological parameters were ge, Height, Weight, BMI, Fat (%) & Pulse rate and Blood pressure (S.B.P and D.B.P) respectively. He demonstrated them the various tests with respect to the selected Anthropometrical and Physiological variables. Before recording the above parameters, the subject was asked to relax physically and mentally for 30 minutes. The height and weight were measured with the help of Stadiometer and weighing machine respectively. All the subjects were investigated by the same expert under the similar conditions of rest and fasting. For statistical analysis and Interpretation of data 't'- test was conducted.

Statistical Analysis: To analyze the effect of Yoga on Anthropometrical and Physiological variables of the college going students within the age group of 18-22 years. The Independent 't' test was used at 0.05 level of significance. To get the final result Mean, Standard Deviation, Difference and t'-test were calculated.

Results:-Total 30 subjects were taken for the study from S.B.S.S Mahavidyalaya, Goaltore, Paschim Medinipur, West Bengal. They were tested before and after the yoga training. The Physiological Variables were assessed by recording the blood pressure (S.B.P and D.B.P) and pulse rate before and after six (6) months of regular yogic exercise or training. The results obtained are expressed as Mean, SD and t-ratio of the 18-22 years male students. The present study reveals that there was significant difference found in reduction in the pulse rate, Systolic Blood Pressure and diastolic Blood Pressure & weight, BMI, and Fat (%) after the Six (6) months of yoga practice. The mean pulse rate (beats/min) before yoga was 78.60 which reduced significantly to 72.50 after six months of yoga practice. The mean systolic blood pressure before yoga practice was (mm of Hg) 127.50 and after six months it was lowered to a highly significant level of 120.50. The mean diastolic blood pressure before yoga was 88.60 and it was reduced significantly to 80.40 after six (6) months of yoga practice. Similarly, the result of Weight, BMI and Fat (%) were also significant at 0.05 Level after the Six (6) months of yoga practice. The before and after the test Mean & SD of all the Anthropometrical variables i.e Weight, BMI and Fat (%) were (60.60±2.60), (55.50±2.80) and (26.80±2.15), (22.60±2.50) and (30.40±1.80), (25.50±2.20) respectively. The subjects were randomly selected for the study as subjects. To measure the blood pressure mercury sphygmomanometer was used and the pulse was recorded after a rest for 30 minutes in right radial artery by Placatory method.

Pulse Rate:-The mean pulse rate (beats/minute) before yoga practice was (78.60±2.50). It was reduced highly significant to (72.50±1.80) (P > 0.001) after six months of yoga practice. The Independent t' test was used at 0.05 Level of significance.

Systolic Blood Pressure:- The mean Systolic Blood Pressure (Mm of Hg) before yoga practice was (127.50±2.05). It was reduced highly significant level to (120.50±2.20) (P > 0.001) after six (6) months of yoga practice. The Independent Paired 't'- test was used at 0.05 level of significance.

Diastolic Blood Pressure:- The mean Diastolic Blood Pressure (Mm of Hg) before yoga practice was (88.60±1.50). It was reduced highly significant level to (80.40±2.20) (P > 0.001) after six months of practice. The Independent paired 't'- test was used at 0.05 level of significance.

Table 1: Significant difference of Pre-test and Post-test within the age group of 18-22 years male on Anthropometrical Variables.

Sl. No	Physical Characteristics	Test	Mean	SD	t-test	Significant
1	Weight (In KG)	Pre-test	60.60	2.60	2.52	0.05
		Post-test	55.80	2.80		
2	BMI	Pre-test	26.80	2.15	2.45	
		Post-test	22.60	2.50		
3	Fat (%)	Pre-test	30.40	1.80	2.35	
		Post-test	25.50	2.20		

*Significant at 0.05 level

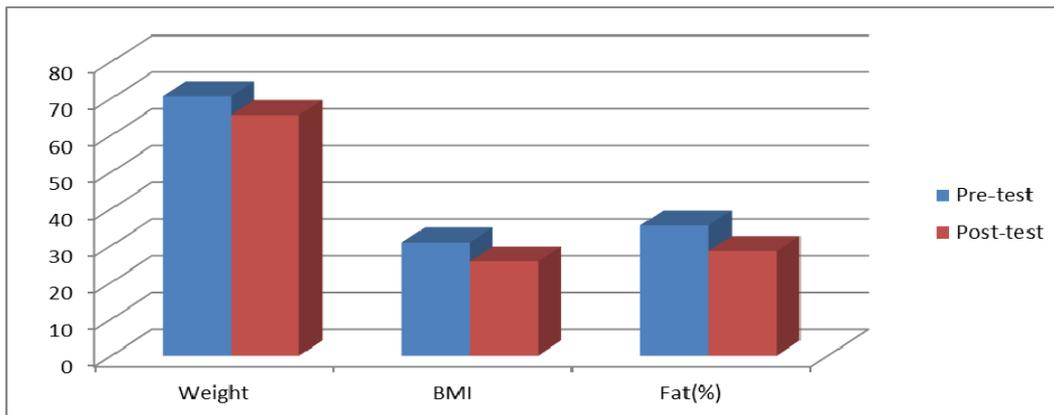


Fig 1: Graph Showing the Physical Characteristic of Pre-test and Post-test within the age group of 18-22 years male on Anthropometrical Variables.

Table-1: Results of the study have been shown in Table-1. It revealed that there were Significant difference in Weight, BMI and Fat (%) within the age group of 18-22 years male because the calculated value of 't' (2.52), (2.45) & (2.35) were more than the tabulated value (2.05) at 0.05 level of significance. So the result is significant. Here Mean and SD of all the

Anthropometrical variables i.e Weight, BMI and Fat (%) were (60.60±2.60), (55.80±2.80) and (26.80±2.15), (22.60±2.50) and (30.40±1.80), (25.50±2.20) respectively. Graphical representation (Fig 1) also indicates the similar trend of this study.

Table 2: Significant difference of Pre-test and Post-test within the age group of 18-22 years male on Physiological Variables.

SL.NO	Physiological Characteristics	Test	Mean	SD	t-ratio	Significant
1.	Pulse Rate (Beats/min)	Pre-test	78.60	2.50	2.10	0.05*
		Post-test	72.50	1.80		
2.	SBP (mm of Hg)	Pre-test	127.50	2.05	2.36	
		Post-test	120.50	2.20		
3.	DBP(mm of Hg)	Pre-test	88.60	1.50	2.45	
		Post-test	80.40	2.20		

*Significant at 0.05 level

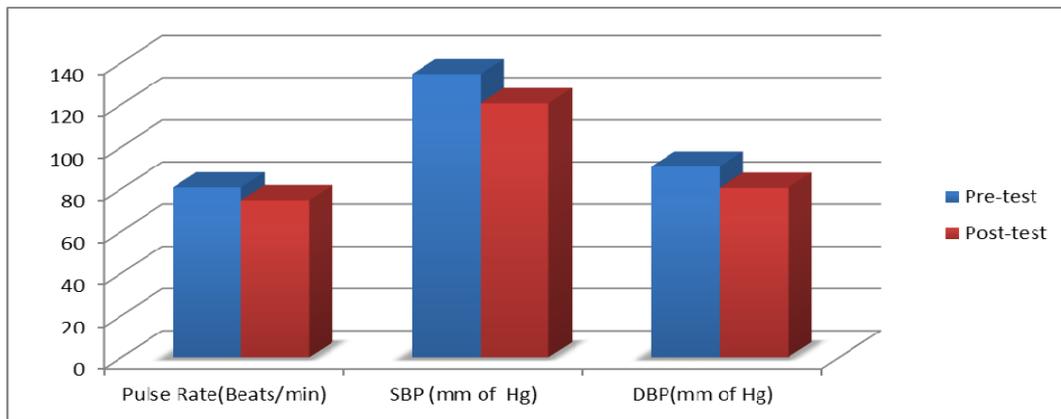


Fig 2: Graphs Showing the Physiological Characteristics within the age group of 18-22 years male regarding Mean and SD.

Table-2: Results of the study have been shown in Table-2. It revealed that there were significant difference in Pulse Rate, Systolic Blood Pressure and Diastolic Blood Pressure of the above 45 years male because the calculated value of 't' (2.10), (2.36) & (2.45) were more than the tabulated value (2.05) at 0.05 level of significance. So the result is significant. Here Mean and SD of Pulse Rate, Systolic Blood Pressure and Diastolic Blood Pressure before and after the six (6) months of training were (78.60±2.50), (72.50 ±1.80), and (127.50±2.05), (120.50±2.20) and (88.60±1.50),(80.40±2.20) respectively. Graphical representation (Fig 2) also indicates the similar trend of this study.

Discussion

From the result of the study it has been observed that there was significant difference found in the Anthropometrical and Physiological variables. On analyze the effect of Yoga on Anthropometrical and Physiological variables of the Adult male i.e above the age group of 45 years male, the results revealed that there were highly significant reduction in the pulse rate, Systolic Blood Pressure and Diastolic Blood Pressure (Mm of Hg) after the six (6) months of yoga practice. Yoga significantly improves the level of stress and anxiety but that improvements were not any greater those of the relaxation group (Smith *et al.* 2007) [13] Yoga acts as an effective treatment for hypertension through the reduction of stress. A significant improvement in the level of blood pressure and body mass index after three (3) months residential training consisting of vegetarian diet and Kriya yoga. In a randomized trial, yoga was found to be equally effective as antihypertensive therapy over an 11 weeks period (Swami Satyananda Saraswati 2001). [14] The mechanism of reduction of blood pressure has been considered to be restoration of bar receptor sensitively by yoga (Tiwari 1983 [15] and Tulpule (1980) [16] The data indicates that 12 weeks of yoga training reduce the heart rate among the school going boys. It supported by observation made by the following studies conducted by Kaushik *et al.* (2006) [17] Cowen and Adams (2005). [18] Present study also confirm the view point of (Upadhyay *et al.* (2008). [19] The blood pressure (S.B.P & D.B.P) was decreased continually after the six (6) months of yoga practice. The mean pulse rate (beats/minute) before yoga practice was (78.60±2.50). It was reduced highly significant to (72.50±1.80) ($P > 0.001$) after six (6) months of yoga practice. The Systolic Blood Pressure (mm of Hg) before yoga practice was (127.50±2.05). It was reduced highly significant level to (120.50±2.20) ($P > 0.001$) after the six (6) months of yoga practice. The mean Diastolic Blood Pressure (Mm of Hg) before yoga practice was (88.60±1.50). It was reduced highly significant level to (80.40±2.20) ($P > 0.001$) after six months

of yoga practice. The Independent paired 't'- test was used at 0.05 level of significance.

Similarly, The Anthropometrical variables i.e Weight, BMI and Fat (%) were (60.60±2.60), (55.50±2.80) and (26.80±2.05), (22.60±2.50) and (30.40±1.80), (25.50±2.20) respectively. The weight, BMI and Fat (%) were also reduced significantly after the six (6) months of yoga practice. The Independent paired 't'- test was used at 0.05 level of significance

Conclusion

Many research studies have been done on the usefulness of yoga in the treatment of various lifestyle related diseases especially cardiovascular disease. It is proved that yoga has significant and healthy impact on the life style of the man. The findings of the study revealed statistically significant in the respect of all selected anthropometric and physiological variables.

On the basis of the results obtained from the present empirical investigation and within the limitation, the following conclusions are drawn after giving the six (6) months of yoga practice.

- 1) The Anthropometrical parameters i.e the Weight, BMI and Fat (%) were significantly reduced after giving the six (6) months of yoga practice.
- 2) The Physiological parameters i.e the Pulse Rate, Systolic Blood Pressure and Diastolic Blood Pressure were significantly reduced after giving the six (6) months of yoga practice.

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