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Effect of exercise and yoga practice on muscle endurance, blood pressure and flexibility in working men

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Abstract

This study aimed to determine how physical activity and yoga affect flexibility, muscular endurance, and blood pressure (systolic and diastolic). 45 middle-aged working men between 35 and 40 years old were selected to achieve this goal. They were divided into three equal groups (n = 15), with group I participating in exercise, group II practicing yoga, and group III serving as a control group that received no additional instruction or physical activity. This study lasted twelve weeks of training with six training days per week. Flexibility, muscle endurance, and blood pressure were measured before and after training. The sit-and-reach test was used to examine flexibility, the sit-and-reach test to assess muscular endurance, and the sphygmomanometer to measure blood pressure. A covariance (ANCOVA) analysis was conducted to determine whether there was a significant difference in the selected criterion variables between the experimental and control groups. The Scheffè S test was used as a post hoc test because there were three groups in this study. The study found that physical activity and yoga improved criteria factors such as flexibility, muscular endurance, and reduced blood pressure (systolic and diastolic). The study results also revealed no statistically significant difference between the experimental groups, such as the physical activity and yoga groups, except for flexibility.

Keywords: Yoga practice, physical exercise, flexibility, muscular endurance, systolic and diastolic blood pressure

Introduction

The degree of usefulness and metabolic efficiency of a living organism is defined as physical fitness. For humans, the overall health of the individual, both body and mind, is a high priority, as is the general meaning of not being sick, damaged, or suffering (as in 'health' or 'well-being'). In 1946, the World Health Organization (WHO) defined well-being as "a state of overall physical, mental, and social well-being and not merely the absence of disease or infirmity." Although this definition has been subject to debate, mainly due to its lack of operational value and the problem caused by using the word "complete", it is still the most popular. Characterization frameworks such as the WHO group of international classifications, including the International Classification of Functioning (ICF) and the International Classification of Diseases (ISD), are commonly used to characterize and measure various aspects of mental well-being. Physical exercise, or holistic health, is any physical activity that improves or maintains a person's health and well-being. Depression, physical endurance, mood, vanity, and academic performance are all associated with increased exercise.

Physical activity is beneficial for several reasons, including maintaining a healthy weight, creating and maintaining strong bones, muscles, and joints, improving physiological well-being, reducing surgical risks, and strengthening the immune system. According to several studies, physical exercise can help people live longer and have a better quality of life. Yoga focuses on mental, emotional, postural, and behavioral aspects without addressing the physical and physiological functions. In contrast, exercise workouts consist of repetitive physical movements aimed solely at improving physical health and fitness by focusing on muscular, cardiovascular, and respiratory functions.

Yog is derived from the root yuj, meaning 'to unite,' and refers to both a path and a kingdom of unity in Sanskrit. Yoga's country results from syntropy: it is a kingdom devoid of time and space limits, a nation that defies counting numbers and power and is unconfirmable by any

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characteristic. All philosophers, spiritualists, and materialists have recognized this truth of pure Consciousness as the necessary axiom of life from which knowledge, will, love, and ideas develop. According to Joshi (1986) [1], all our breaths are counted, and our life expectancy is determined by the number of times we will breathe in each life; because of this fact, we should take less breaths to live longer; this notion was responsible for the origin of pranayama. All movements are based on flexibility, defined as the range of motion around a joint. Lifting a small object, sitting down, standing, and hammering a nail into a wall all require flexibility, but other qualities, such as strength, are also important. Blood pressure (BP) is a measure of the force exerted by the circulating blood on the venous dividers and is one of the most critical indicators: blood pressure oscillates between maximum (systolic) and minimum (diastolic) pressure with each pulse. Muscular endurance is a term that refers to the combination of behavioral intensity and the direction or emotion of effort.

Methods

The effects of physical activity and yoga practice on

flexibility, muscle endurance, and blood pressure are being investigated in this study (systolic and diastolic). Only middle-aged men between the ages of 35 and 40 who worked as school teachers in the Lucknow District, Uttar Pradesh State, were chosen. Forty-five volunteers were chosen at random and divided into three groups of fifteen, with group I (n = 15) receiving physical exercise, group II (n = 15) receiving yoga practice, and group III (n = 15) receiving no treatment. For twelve weeks, the training program was conducted six days a week (Monday to Saturday) during morning sessions only (6 am to 8 am). The sit-and-reach test assessed flexibility, muscular endurance was measured with the help of a modified sit-up test, and blood pressure was measured using a sphygmomanometer.

Analysis of Data

The data on flexibility, muscular endurance, and blood pressure (systolic and diastolic) acquired before and after the trial periods on the physical exercise, yoga practice, and control groups were analyzed and shown in Table 1.

Table 1: Analysis of Covariance and 'F' ratio for Flexibility, Muscular endurance, and Blood Pressure (systolic and diastolic) for Physical exercise Group, Yoga Practice Group and Control Group

Variable Name	Group Name / Test \pm S.D.	Physical Exercise Group	Yoga Practice Group	Control Group	'F' Ratio
Muscular endurance (in No./min)	Pre-test Mean \pm S.D.	9.00 \pm 1.96	8.40 \pm 1.77	8.13 \pm 2.13	0.769
	Post-test Mean \pm S.D.	11.40 \pm 2.23	11.33 \pm 1.60	8.13 \pm 2.03	13.50*
	Adj. Post-test Mean	10.971	11.431	8.48	40.48*
Systolic Blood Pressure (in mmHg)	Pre-test Mean \pm S.D.	132.47 \pm 3.68	134.20 \pm 2.68	134.20 \pm 2.40	1.70
	Post-test Mean \pm S.D.	130.40 \pm 3.58	131.60 \pm 2.70	134.93 \pm 2.72	9.05*
	Adj. Post-test Mean	131.531	131.081	134.496	42.56*
Diastolic Blood Pressure (in mmHg)	Pre-test Mean \pm S.D.	95.80 \pm 2.04	94.20 \pm 1.86	94.93 \pm 2.40	2.15
	Post-test Mean \pm S.D.	93.80 \pm 2.11	91.53 \pm 2.13	94.87 \pm 2.20	9.42*
	Adj. Post-test Mean	93.026	92.265	94.906	41.03*
Flexibility (in Inches)	Pre-test Mean \pm S.D.	4.25 \pm 0.27	4.05 \pm 0.29	4.04 \pm 0.27	2.83
	Post-test Mean \pm S.D.	4.54 \pm 0.32	4.65 \pm 0.25	4.02 \pm 0.24	22.43*
	Adj. Post-test Mean	4.417	4.702	4.088	94.39*

* Significant at .05 level of confidence. (The table values required for significance at .05 level with df 2 and 42 and 2 and 41 are 3.22 and 3.23 correspondingly).

Muscle endurance was 1.66 for the physical activity, yoga practice, and control groups, which was not statistically significant. The post- and adjusted post-test mean 'f' ratios were 8.07 and 50.50, respectively, higher than the required table value of 3.23. The pre-test mean of systolic blood pressure for the physical activity, yoga practice, and control groups was 1.70, which was insignificant. The superiority of the 'f' - the ratio of post- and adjusted post-test means was 9.05 and 42.56.

The pre-test mean of diastolic blood pressure for the physical activity, yoga practice, and control groups was 2.15, which was insignificant. The post and adjusted post-test mean 'f' ratios were 9.42 and 41.03, respectively, higher than the required table value of 3.23 for significance. This study found

a significant difference between the physical exercise, yoga practice, and control groups on chosen criteria factors.

The 'f' - ratio values of pre-test mean flexibility for the physical exercise, yoga practice, and control groups were 2.83, which was not statistically significant. The 'f' - ratio of post- and adjusted post-test means was 22.43 and 94.39, respectively, higher than the required table value of 3.23 for significance with df 2 and 41 at the .05 confidence level. The results of this study revealed a substantial difference in flexibility between the physical activity group, yoga practice group, and control group.

The Scheff S test was used as a post-hoc test to assess whether the adjusted post-test means had a significant difference. Table II displays the results of the follow-up test.

Table 2: Scheffé S Test for the Difference Between the Adjusted Post-Test Means of Flexibility, Muscular endurance, and Blood Pressure (systolic and diastolic)

Adjusted Post-test Mean of Flexibility				
Physical Exercise Group	Yoga Practice Group	Control Group	Mean Difference	CI
4.417	4.702		0.285*	0.113
4.417		4.088	0.329*	0.113
	4.702	4.088	0.622*	0.133
Adjusted Post-test Mean of Muscular endurance				
10.971	11.431		0.46	0.895
10.971		8.48	2.491*	0.895
	11.431	8.48	2.951*	0.895
Adjusted Post-test Mean of Systolic Blood Pressure				
131.531	131.081		0.45	0.990
131.531		134.496	2.965*	0.990
	131.081	134.496	3.415*	0.990
Adjusted Post-test Mean of Diastolic Blood Pressure				
93.206	92.265		0.941	0.762
93.206		94.906	1.70*	0.762
	92.265	94.906	2.641*	0.762

* Significant at 0.05 level of confidence.

Results

After applying analysis of covariance, this study showed a significant difference between exercise, yoga practice, and control groups in changes in flexibility, muscular endurance, and blood pressure after twelve weeks of training. Criterion variables, such as flexibility and muscular endurance, were improved for the exercise and yoga groups, and systolic and diastolic blood pressure decreased significantly after the exercise and yoga periods. Regarding flexibility, the yoga group improved significantly more than the physical activity group. Exercise and yoga greatly improved physical fitness and physiological and psychological variables.

Conclusion

The exercise and yoga groups significantly improved their flexibility compared to the control group. An aerobic exercise program plays an important role in improving flexibility. Practicing yoga has been shown to improve flexibility by performing different poses for longer periods of time, engaging different muscles and joints of the human body. The result of the study further shows that no significant differences were found between the experimental groups. Daily exercise or yoga practice can also improve self-confidence or muscle endurance. The exercise and yoga groups significantly reduced systolic and diastolic blood pressure compared to the control group. Research has shown significant systolic and diastolic blood pressure reductions after exercise and yoga in active middle-aged men. Walking also lowers systolic and diastolic blood pressure, as continuous activity increases energy expenditure and improves the body's working conditions. Some studies have found significant systolic and diastolic blood pressure decreases due to yoga practice.

Conflict of Interest

The author declares that there is no conflict of interest.

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