ORIGINAL RESEARCH PAPER

Physical Education

EFFECT OF PRANAYAMA ON ABDOMINAL MUSCLE STRENGTH CARDIO RESPIRATORY ENDURANCE AND FLEXIBILITY

KEY WORDS: Abdominal muscle strength, cardio respiratory endurance and flexibility.

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ABSTRACT

The aim of this study was to investigate the 24-week effect of pranayama on abdominal muscle strength, cardio respiratory endurance and flexibility. Only 30 college students (boys) between the ages of 22 and 27 were assigned part-time to train at the Bharati Vidyapeeth College of physical education. Abdominal muscle strength, cardio respiratory endurance and flexibility were measured in this study. Pranayama works five days a week and training classes were held in the evening for a period of 50 minutes. Paired t 'tests were used to investigate the existence of significant differences between the pre- and post-test phases of the 24-week pranayama program. In conclusion the improvement was found after twenty-four weeks of the pranayama system and the differences were statistically significant. Pranayama not only beneficial for mental health but also improves abdominal muscle strength, cardio respiratory endurance and flexibility.

INTRODUCTION

Yoga is a spiritual program and a philosophical program, but it is also the oldest and most tested form of physical and mental exercise known as personality. Yoga breathing is considered as the link between the mind and body. Yoga breathing owes their great power to prana. Regular practice of yoga breathing offers great benefits with the full and complete use of the prana system (Nancy, 1986).

The science of breathing yoga is called pranayama. Oxygen is the most important nutrient in our bodies. The integrity of the brain, nerves, glands, and internal organs is essential. It is a systematic respiratory system, which strengthens the lungs, which improves blood circulation and makes a man healthier and gives him a longer life expectancy. It aids the functioning of the respiratory system in the best possible way where life force can be activated and controlled to bypass normal human limitations or limits and achieve a high degree of vibrational energy (Iyengar, 1981).

Pranayama is the practice of breathing exercises with three scientific disciplines namely Puraka (Smell), Kumbhaka (Breathing in the lungs) and Rechaka (Exhalation) in a continuous process that works in the middle and the effects spread to the periphery, too. One has to understand that the purpose of pranayama is to affect the proper balance between Ida (Breath of the Moon) and Pingala (Breath of the Sun) nadis and to gain physical, spiritual uplifting through the acquisition of light and knowledge from Sushumna nadi. From a physical point of view, the right balance between nadis ensures health, strength, peace and longevity. Pranayama has seasonal effects on its strategy and performance. Therefore pranayama selection of exercise schedule should be based on seasonal requirements. During the three-stage exercise, inhalation, inhalation and exhalation should be considered 1: 1: 1 (First Phase) 1: 2: 2 (Intermediate Phase) and 1: 4: 2 (Advanced Phase).

It is therefore a need for an hour for all people to know the life impact of pranayama intervention. Thus, current research seems to be important and has its role in society.

Considering this theory, the current researcher was of the opinion that pranayama not only improved our mental health but also improved our physical characteristics. The researcher therefore conducted the study entitled "The effect of pranayama on abdominal muscle strength and cardio respiration and flexibility".

Definition of Terms

Muscle Strength

Muscle strength is defined as the ability of a muscle to produce energy with great intensity in short periods of time. It is a conditional skill, and it depends largely on the processes of releasing muscle strength. Energy, the most important motor skill in sports is a direct product of muscle contraction. All sports movements are caused by muscle contraction and therefore, strength is part of all motor skills, technical skills and strategic actions. Strength training is good for overall health, good posture and injury prevention.

Muscle Endurance

Muscle endurance is defined as the ability of muscles to support the production of repetitive energy with low to moderate intensity over an extended period of time. It shows that muscles are strong enough to move for a long time and can complete many repetitions. In a physical education program each day during the warm-up phase of each lesson students should improve muscle endurance by participating in abdominal exercise sets with increasing numbers as time goes on.

Flexibility

Flexibility is defined as the ability to move muscles and joints through their full range of motion. Most people will ever experience back problems. About 80% of these lower back problems are caused by weakness and or strong muscles. Many daily activities place a heavy burden on these muscles. Physical inactivity may play a role in risk factors for back problems. This means that these problems can be reduced or limited by the development of fitness. Physical inactivity contributes to the loss of flexibility of the back and flexed hips, prolonged sitting encourages inactivity that will lead to loss of flexibility.

Statement of the problem

The purpose of this research study was to find out the effect of twenty four weeks of pranayama on abdominal muscle strength, cardio respiratory endurance and flexibility.

Method and materials

Subjects

The study was descriptive experimental type. Thirty male college students were selected randomly for this study, whose age range from 22 to 25 years. These subjects were selected from Bharati Vidyapeeth, Pune.

TEST/TOOLS:

Bent Knee Sit-Ups Test

Purpose:

To measures the muscular endurance of the abdominal muscles.

Equipments:

Mats, stop watch and score sheet.

Procedure:
The subjects were asked to take a supine lying position on the mat, knees bent to an angle less than 90 degrees, and hands clasped behind neck. The angles were held firmly on the ground by another subject. The performer lifted his trunk, touched his knees with forehead and then lowered his trunk touching the mat with his elbows. This exercise was done continuously without pause for one minute. Numbers of correctly executed sit ups were recorded as his performance.

Scoring:
The maximum number of repetitions performed in sixty seconds is the score. The repetition was not counted when finger tips did not maintained contact behind the head, when the knees were not touched.

Twelve Minutes Run-Walk Test
Purpose:
To measures Cardio Respiratory Endurance.

Equipments:
Football field, stopwatch, whistle, score sheet, pencil and clapper, etc...

Procedure:
For this test a foot ball field was prepared with marking at every ten meters for 200m as in the above picture. The groups of fifteen subjects were doing this test. The subjects were asked to stand on the starting position and were given instructions to cover as much distance as possible by running, jogging or walking, if running throughout the twelve minutes period was not possible. They were instructed to continue till the final whistle was blown and to stop before. With the starting whistle they started and at the end of twelve minutes the whistle was blown. The number of minutes left was announced to the subjects every minute, and the subjects jogged with moving forward the final whistle. When the signal to stop was given, they immediately stopped their running.

Scoring:
The subject was concerned about covered the distance. The score in meter was determined by multiplying the number of complete laps (200 meters) completed, plus the number of segments of five meters of an incomplete lap plus the number of meters stopped off between a particular segments.

Sit and Reach Test
Purpose:
To measures the flexibility of the back and leg (hamstring) muscles.

Equipments:
A sit and reach box, centimetre scale, score sheet and pencil.

Procedure:
The subjects were asked to assume a sitting position on the floor with fully extended legs. A sit and reach box kept closer to the feet in such a way that, the bottom of the feet were forwardly fixed at the box. The subject was asked the arms are extended forward with one hand on top of the other and finger pads on top of fingernails. The subject reaches directly forward, palms down, along the measuring scale three times, holding the position of maximum reach the last time for one full second.

Scoring:
Three trials were taken to each subject. Each attempt was held for one second and the measurement is taken to the nearest centimetre.

Statistical Procedure
Paired' test was applied to investigate the existence of significant difference between pre and post test of pranayama on abdominal muscle strength, cardio respiratory endurance and flexibility.

Findings:
Table 1:Mean SD and T' Ratio of abdominal muscle strength of college students

VARIABLES	SUBJECTS	MEAN	SD	'T' TEST	REMARKS
Abdominal muscle strength (pre test)	Boys(30)	21.67	2.21	3.35	*Significant
Abdominal muscle strength (post test)	Boys(30)	27.07	2.26		

't' value required to be significant at 0.05 level of confidence with 29 degree of freedom was 2.045

Table 2 Mean SD and T' Ratio of cardio respiratory endurance of college students

VARIABLES	SUBJECTS	MEAN	SD	'T' TEST	REMARKS
Cardio respiratory endurance (pre test)	BOYS(30)	1438	82.56	3.08	*significant
Cardio respiratory endurance (post test)	BOYS(30)	1491	50.54		

't' value required to be significant at 0.05 level of confidence with 29 degree of freedom was 2.045

Table -3 Mean SD and T' Ratio of flexibility of college students

VARIABLES	SUBJECTS	MEAN	SD	'T' TEST	REMARKS
Flexibility (pre test)	BOYS(30)	2.43	0.37	2.68	*significant
Flexibility (post test)	BOYS(30)	2.62	0.25		

't' value required to be significant at 0.05 level of confidence with 29 degree of freedom was 2.045

Discussion of Findings
In this study, it aimed to investigate the 24-weeks effect of pranayama on abdominal muscle strength, cardio respiratory endurance and flexibility. It was found in the above statistics that after 24 weeks of pranayama, abdominal muscle strength, cardio respiratory endurance and flexibility were improved and improvement was statistically significant. According to the findings, there are beneficial effects of pranayama on abdominal muscle strength, cardio respiratory endurance and flexibility.

These findings are consistent with the results of certain studies such as, Gharote (1985) conducted a study and proved that Yogic exercise improves muscle strength and endurance of women's abdominal muscles, Sakthignanavel et.al (1998) also suggested that pranayama practices improve muscle endurance. John Walsakom (2000 examined that yoga exercises improve balance, flexibility, muscle endurance and response time, Madanmohan et.al (1992) suggested that yoga training significantly improves response time, respiratory endurance and muscle strength, Chen et. al (2009) found that yogic exercise interventions improve flexibility, muscle strength, and cardiopulmonary strength and Bharatha et.al (2011) suggested that yogic practice significantly improved muscle flexibility.

When one performs Asanas and Pranayama regularly and systematically for a long time, it is guaranteed to find that they serve as therapies that prevent various types of mental and physical illnesses. The body will become light, and intellect will turn sharp and clear, memory will grow strong, will-power assumes firmness and rigidity, body fat and heart rate will be reduced, the belly will no longer project, the face will look serene, the eyes will grow bright and lustrous, the voice will turn sweet, an improve in static motor performance,

personality development, lung capacity and respiratory, brain functions and physical fitness.

In the present study, it was proposed that practicing pranayama would have beneficial effects on abdominal muscle strength, cardio respiratory endurance and flexibility. The findings provide evidence supporting this. Overall, it was concluded that pranayama training program has beneficial effects on various types of strength endurance and flexibility.

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