



Effect of Pranayam on Selected Body Composition Variables

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Abstract

The purpose of the study was to determine the effect of Pranayam on selected body composition variables. Thirty male students of B.P.E. first year of CCS University, Meerut, were randomly selected as subjects for this study. Subjects were divided into two groups i.e. one experimental group and one control group. The quantitative measurements of each subject were taken with the help of standard equipment, before and after the treatment period of twelve weeks. The selected Body Composition Variables were Body Fat (%), Lean Body Mass (kg), Body Water Content (%) and Basal Metabolic Rate (Kcal). All the tests were administered in the Yoga Laboratory of the Institute. Paired 't' test was applied to determine the effect of Pranayam on selected Body Composition Variables. The Paired 't' test revealed that practice of Pranayam had significant effect on Body Fat Percentage ($t = 5.47$), Lean Body Mass ($t = 9.65$), Body Water Content ($t = 17.24$) and Basal Metabolic Rate ($t = 9.410$) against required tabulated value of 1.761 which showed significant effect of practice of Pranayam. On the basis of results following conclusions were drawn: 1. Significant effect was found on Body Fat Percentage. 2. Significant effect was found on Lean Body Mass. 3. Significant effect was found on Body Water Content. 4. Significant effect was found on Basal Metabolic Rate.

1. INTRODUCTION

Today yoga being a subject of varied interests, has gained world-wide popularity. Recent research trends have shown that it can serve as an applied science in a number of fields such as education, physical education and sports. Health and family welfare, psychology, medicine and also one of the valuable means for the development of human resources for better performance and productivity. However, there exists controversy in accepting yoga as medicine and therapy because it has generally been believed that yoga is spiritual science having emancipation as its goals and hence cannot be treated only as a therapy.

Yoga exercises are scientific means for strengthening of all living or atrophying muscle fibers and tissues. This system teaches how to awake new life pulsation in active tissues. In this context it is different from other systems of exercise in as much as it is different from other systems of exercise in as much as it teaches one how to concentrate his attention on the awakened energy which directly gives power, strength and vitality of all the parts of the body. It develops will power along with bodily strength. This aspect of yoga is technically known as "asanas" which was developed by the late hatha yoga into a well-organized system of physical culture.

Pranayama is a science of respiration. It consists of three phases: Puraka, Kumbhaka, and Rechaka. High abdominal pressure created in pranayama by the action and counter action of the different anatomical parts together with the upward pull of the crura, is responsible for wakening of Kundalini.

The word Pranayam is a compound consisting of two members: Kapal and Bhati. In Sanskrit Kapal means the skull and Bhati is derived from a Sanskrit root meaning to shine. Hence Pranayam means an exercise that makes the skull shining. Pranayam is one of the six cleansing processes, known in Hatha yoga as shat kriya, and is intended to clear the nasal passages contained in the skull, along with the remaining parts of the respiratory system. As the exercise necessarily cleanses a part of the skull, the name Kapalabhati is appropriately given to it.

The assessment of body composition is generally performed in order to determine and monitor one's health and fitness status, and to aid in planning training programs for athletes. It has been well established that a high percentage of body fat (low lean body mass) is associated with a higher risk of heart disease, diabetes, hypertension, cancer, hyperlipidemia and a variety of other health problems. On the other hand, a high percentage of lean body mass and low-fat mass is associated with athletic prowess and good health.

2. OBJECTIVES OF THE STUDY

- To know the effect of Pranayam on Body Fat Percentage
- To know the effect of Pranayam on Lean Body Mass
- To know the effect of Pranayam on water content
- To know the effect of Pranayam on Basal Metabolic Rate.

3. METHODOLOGY

3.1. Subjects

Thirty male students were randomly selected from B.P.E. I Year of Lakshmi Bai National Institute of Physical Education (Deemed University), Gwalior. The age group was from 17-22 years. Further two groups i.e. one experimental group and one control group (each of 15 students) were randomly selected from the selected subjects.

3.2. Variables

The following Body Composition Variables were chosen for the study. Body Fat Percentage, Lean Body Mass, Water Content and Basal Metabolic Rate.

3.3. Criterion Measures

The criterion measures chosen for testing hypothesis were: Body Fat Percentage (percentage), Lean Body Mass (Kilogram), Water Content (percentage) and Basal Metabolic Rate (Kilo calories).

3.4. Training of Pranayam

There were two groups i.e. control group and experimental group. Control group was not given any kind practice of pranayama however experimental group was exposed to training of Pranayam pranayama for the duration of twelve week. Both the groups were performing their regular practice of the game. For the experimental group, the duration of training session was half-an-hour and the training was conducted in the afternoon 3:00 to 3:30 pm from Monday to Friday.

3.5. Pranayam

It consists of active puraka and passive recheka. In every Recheka during Pranayam as much air was expelled or driven out of the lungs as a sudden and vigorous inward stroke of the front abdominal muscles. At the end of Recheka, abdominal muscles are contracted. But in puraka one had to simply withdraw his control from these muscles and they were relaxed. Relaxation of muscles is a passive act. Time duration was for first 2 weeks was 10 minutes. In Pranayam, the rest of 2 minutes was allowed after every five minutes. After 2 weeks time it was increased gradually.

3.6. Design of the Study

Random group design was utilized for the purpose of the study.

4. ADMINISTRATION OF TESTS

The tests for Body Fat Percentage, Lean Body Mass, Water Content and Basal Metabolic Rate were administered in the Yoga Research Laboratory of Lakshmibai National Institute of Physical Education, Gwalior with the help of a team of tester and research assistant under the guidance and supervision of the experts using Body Composition Analyzer with following standard procedure:

- Measure the exact height
- Step on the equipment
- Track the exact weight minus the additional weight
- Feed the built of an individual (Standard/ Athletic)
- Feed in the gender
- Feed the age of an individual
- Feed the height in cms
- Enter n wait for the process to complete
- Take out the analyses from print out.

5. STATISTICAL TECHNIQUE

In order to find out the effect of Pranayam on selected Body composition variables, paired 't' test was applied at 0.05 level of significance.

6. ANALYSIS OF DATA AND RESULT OF THE STUDY

The statistical analysis of data and results of the study are presented from Tables 1-4.

Table 1: Body Fat Percentage

Groups	\bar{D}	S	't' ratio
Experimental Group	3.68	2.60	5.47*
Control Group	0.007	0.0764	0.354a

*Significant $t_{0.05}(14) = 1.761$

Since the calculated t (5.47) is more than tabulated t (1.761) at 0.05 level of significance, thus it may concluded that the Body Fat Percentage shown the significance effect of Pranayam.

Table 1 reveals that the significance effect not shown in the control group. Calculated 't' value of control group is t (0.354) which is below the required value of 0.05 level of significance (t = 1.761). It has no effect on Body Fat Percentage of Control Group.

Table 2: Lean Body Mass

Groups	\bar{D}	S	't' ratio
Experimental Group	1.01	0.405	9.65*
Control Group	0.64	1.417	1.747

*Significant $t_{0.05}(14) = 1.761$

Since the calculated t (9.65) is more than tabulated t (1.761) at 0.05 level of significance, thus it may concluded that the Lean Body Mass shown the significance effect of Pranayam.

Table 2 reveals that the significance effect not shown in the control group. Calculated 't' value of control group is t (0.354) which is below the required value of 0.05 level of significance (t = 1.761). It has no effect on Lean Body Mass of Control Group.

Table 3: Water Content

Groups	\bar{D}	S	't' ratio
Experimental Group	1.25	0.287	17.24*
Control Group	0.69	1.810	1.475

*Significant $t_{0.05}(14) = 1.761$

Since the calculated t (17.24) is more than tabulated t (1.761) at 0.05 level of significance, thus it may concluded that the Body Water Content shown the significance effect of Pranayam.

Table 3 reveals that the significance effect not shown in the control group. Calculated 't' value of control group is t (0.354) which is below the required value of 0.05 level of significance (t = 1.761). It has no effect on Body Water Content of Control Group.

Table 4: Basal Metabolic Rate

Groups	\bar{D}	S	't' ratio
Experimental Group	139.7	57.45	9.410*
Control Group	0.533	1.45	1.422

*Significant $t_{0.05}(14) = 1.761$

Since the calculated t (9.410) is more than tabulated t (1.761) at 0.05 level of significance, thus it may concluded that the Basal Metabolic Rate shown the significance effect of Pranayam.

Table 1 reveals that the significance effect not shown in the control group. Calculated 't' value of control group is t (0.354) which is below the required value of 0.05 level of significance (t = 1.761). It has no effect on Basal Metabolic Rate of Control Group.

7. CONCLUSIONS

Within the limitations of the present study the following conclusions were drawn:

- Significant effect was found on Body Fat Percentage and no change was found in Control group.
- Significant effect was found on Lean Body Mass and no change was found in Control group.

- Significant effect was found on Body Water Content and no change was found in Control group.
- Significant effect was found on Basal Metabolic Rate and no change was found in control group.

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