EFFECTS OF 6-WEEK HATHA YOGA PRACTICES ON BASAL METABOLIC RATE AND LEAN BODY MASS OF BACHELOR STUDENTS

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Abstract

The purpose of the study was to find out the effect of 6-Week hatha yoga practices on basal metabolic rate and lean body mass of bachelor students. The study was conducted on 30 yoga participants of 18 to 22 years in age at random. The selected subject were divided into two equal groups (experiment group and control group). The Experimental group underwent training for four weeks with the asanas in Hatha Yoga namely; (Paschimottanasana, Natrajasana, Nidrasana, Mayurasana and Savasana), the control group continues their daily routine work. The difference in the mean of each group for selected variable was tested for the significance of difference by “t” test. The level of significance was set at 0.05. Results shows that the Hath yoga practices have a significant improvement on basal metabolic rate and lean body mass. It may be recommended to improve strength and endurance of respiratory muscles and may contribute to enhanced voluntary control of breathing.

KEY WORDS: Hath yoga, basal metabolic rate, Lean body mass.

INTRODUCTION:

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. However, little is known about the physiological and psychological effects of hatha yoga practice. The school of hatha yoga attaches a lot of importance to the perfect physical form, believing it to be a way of attaining spiritual perfection and to this end it takes the help of pranayama (breath-control exercises) and mudras (hand gestures) to attain self-realization. Often seen as part of Raja Yoga, the origins of hatha yoga can be traced to Gorakhnath, the 12th-century founder of the Kanphata Yogis. The word 'hatha' is derived from the two root terms, 'ha' meaning 'the sun' and 'tha' meaning 'the moon'. Taken together, the term stands for 'union of force'. Hence, central to hatha yoga disciplines is the harmonizing of its positive (sun) and negative (moon) currents.

Hatha yoga is the most popular branch of yoga. It is known as a branch of yoga that unites pairs of opposites, and its goal is to achieve balance between body & mind by: Postures (physical tone & awareness); Breathing techniques (controlled breathing); Meditation (controlled concentration). The three main elements used in hatha yoga to attain its purposes are the body,
the physical part of man; the mind, the subtle part; and the element that relates the body with the mind in a special way, the breath. Over the last 10 years, a growing number of research studies have shown that the practice of hatha yoga can improve strength and flexibility, and may help control such physiological variables as blood pressure, respiration and heart rate, basal metabolic rate and lean body mass to improve overall exercise capacity.

PURPOSE OF THE STUDY

The purpose of the study was to assessing the effect of 6-week of hath yoga practices on basal metabolic rate and lean body mass of bachelor students.

HYPOTHESIS

\[ H_0: \mu_Y = \mu_X \]
\[ H_1: \mu_Y \geq \mu_X \]

It was hypothesis that there would no significance difference on basal metabolic rate and lean body mass

METHODOLOGY

The study was conducted on 30 yoga participants of 18 to 22 years in age at random. The selected subject were divided into two equal groups 15 each namely experimental group and control group. The Experimental group underwent training for 6-weeks with the asanas in Hath Yoga namely; (Paschimottanasana, Natrajasana, Nidrasana, Mayurasana and Savasana), the control group continues their daily routine work. The two pairs of electrodes will be attached. The first pair of electrodes will be placed on wrist and hand and the second pair of electrodes will be placed at the ankle and foot of the same side. Single frequency low amplitude imperceptible current (500-800 microampere at 50kHz) will be introduced via the outer electrodes and voltage decrease will be detected by the electrodes at the wrist and ankle. Based on these measurements, basal metabolic rate and lean body mass and various bioelectrical impedance parameters will be calculated.

Four week of Yogasanas training programme

First stage in Hath yoga is Asana. The aim of asanas is to strengthen the body, clearing the impurities of nadis and to make the body fit for sitting comfortably in meditation for long hours. The present study had been undertaken to examine the effect of selected asanas in hatha yoga on basal metabolic rate and lean body mass. The experimental group received training in physical postures (asanas, 90 minutes). The asanas which were practiced every day included:

1. **Matyasana (Fish pose)**
2. **Hal asana (Plough pose)**
3. **Noukasana (Boat pose)**
4. **Ardhachakrasana and**
5. **Bhujangasana (Cobra poses)**

STATISTICAL TECHNIQUE

The difference in the mean of each group for selected variable was tested for the significance of difference by “t” test. The level of significance was set at 0.05.
RESULT AND DISCUSSIONS

The study was conducted to find out the effects of selected asanas in hatha yoga on basal metabolic rate and lean body mass. The statistical analysis of data collected on thirty (N=30) subjects. For each of the chosen variable, the results pertaining to significant difference, if any, between experimental and control groups were assessed by “t” test and are presented in following tables:

**Table I.** Mean values (±SD) of basal metabolic rate in yoga asana and control groups (n = 15 each) before (Pre) and after (Post) 6-weeks of training asanas

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Mean</th>
<th>S.D.</th>
<th>SEM</th>
<th>‘t’ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment (Pre-test)</td>
<td>15</td>
<td>1621.8</td>
<td>174.1</td>
<td>44.9</td>
<td></td>
</tr>
<tr>
<td>Experimental (Post-test)</td>
<td>15</td>
<td>1763.4</td>
<td>174.7</td>
<td>45.1</td>
<td>8.779*</td>
</tr>
<tr>
<td>Control (Pre-test)</td>
<td>15</td>
<td>1601.6</td>
<td>116.8</td>
<td>30.1</td>
<td></td>
</tr>
<tr>
<td>Control (Post-test)</td>
<td>15</td>
<td>1601.6</td>
<td>117.5</td>
<td>30.3</td>
<td>0.174</td>
</tr>
</tbody>
</table>

*Significant at 0.05 level. Tab t .05 (14) = 2.14

Table-I shows that the mean of basal metabolic rate of pre-test of experimental group and post-test of experimental group was 1621.8 and 1763.4 respectively, whereas the mean of basal metabolic rate of pre-test of control and post-test of control group was 1601.6 and 1601.6. The “t” value in case of experimental group was 8.779 and for control group it was 0.174. Since cal. t (=8.779) > tab t .05 (14) (=2.145), Ho (null hypothesis) is rejected at .05 level of significance. Thus it may be concluded that 6-week training program of asanas leads to significant improvement in basal metabolic rate of students. No significant change over that 6-week yoga training was noted in the control group, not subjected to any training. As per the study the above remark can be given at 95% confidence. The graphical representation of responses has been exhibited in figure-1.

**Figure-1** Graphically represents the basal metabolic rate of experimental and control group
Table II. Mean values (±SD) of lean body mass in yoga asana and control groups (n = 15 each) before (Pre) and after (Post) 6-weeks of training asanas

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Mean</th>
<th>S.D.</th>
<th>SEM</th>
<th>'t' Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment (Pre-test)</td>
<td>15</td>
<td>56.24</td>
<td>5.91</td>
<td>1.52</td>
<td>9.933</td>
</tr>
<tr>
<td>Experimental (Post-test)</td>
<td>15</td>
<td>57.42</td>
<td>5.96</td>
<td>1.53</td>
<td></td>
</tr>
<tr>
<td>Control (Pre-test)</td>
<td>15</td>
<td>54.56</td>
<td>3.13</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>Control (Pre-test)</td>
<td>15</td>
<td>58.40</td>
<td>10.5</td>
<td>2.73</td>
<td>1.373</td>
</tr>
</tbody>
</table>

*significant at 0.05 level of confidence

Table-II shows that the mean of lean body mass of pretest of experimental group and posttest of experimental group was 56.24 and 57.42 respectively, whereas the mean of lean body mass of pretest of control and posttest of control group was 54.56 and 58.40. The ‘t’ value in case of experimental group was 9.933 and for control group it was 1.373. Since cal. t (=9.933) > tab t .05 (14) (=2.14), Ho (null hypothesis) is rejected at .05 level of significance. As per the study the above remark can be given at 95% confidence. Thus it may be concluded that 6-week training program of asanas leads to significant improvement in lean body mass of students. No significant change over that 6-week yoga training was noted in the control group, not subjected to any training. As per the study the above remark can be given at 95% confidence. The graphical representation of responses has been exhibited in figure-1. The graphical representation of responses has been exhibited in figure-2.

Figure-2 Graphically represents the Lean Body Mass of experimental and control group

From the results it is evident that the 6-week of Yogic practice training programme showed significant improvement in basal metabolic rate and lean body mass. The findings is supported by the study conducted by M. A. Descamps (Paris) where he found that asanas yoga postures are generators of dynamic action when there is an extension of the spinal column, whilst they lead to quiet states when there is a flexion of it. Nussbaum (France) studied several...
parameters concerning hatha-yoga and concluded that it provides a regular functioning of the main bodily functions fostering thus a psycho-physical balance. Wallace and Benson (U.S.A.) proved that transcendental meditation increases aerobic metabolism, counteracting anaerobic metabolism which is related to mental distress.

**INFERENCES**

Since calculated “t” is greater than tab t.05, Ho (null hypothesis) may be rejected at .05 level of significance. Thus it may be concluded that 4-week of Yogic practice training programme have a significant effect on maximum oxygen consumption and vital capacity. As per the study the above remark can be given at 95% confidence.

**CONCLUSIONS**

Findings of this exploratory study suggest that the treatment of 6-week of yogic practices training programme showed significant improvement in basal metabolic rate and lean body mass.

**RECOMMENDATION**

Yoga practices improves the basal metabolic rate and lean body mass remarkable this type of training may be recommended to improve strength and endurance of respiratory muscles and may contribute to enhanced voluntary control of breathing and also be recommended for the different age group and athletes of different games and sports.

**REFERENCE**