

## Effect of Kapalbhathi Pranayama on Body Mass Index and Abdominal Skinfold Thickness

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### Abstract

A total of 60 overweight resident doctors were recruited in this study. The participants were divided into study and control groups, each group containing 30 subjects of both sexes. The study group was asked to perform Kapalbhathi pranayama for 8 weeks. Body mass index and abdominal skinfold thickness were assessed in both the groups. Paired t-test was applied for statistical analysis and p-value <0.05 was considered the level of significance. In study group, body mass index and abdominal skinfold thickness decreased significantly as compared to that of control group. The results of this study show that Kapalbhathi has reducing impact on Body Mass Index and Abdominal Skinfold Thickness in overweight individuals.

### Keywords

*abdominal skinfold thickness, kapalbhathi pranayama, body mass index (BMI)*

### Introduction

With increased awareness and interest in health and natural remedies, yogic techniques including pranayama are gaining importance and becoming increasingly acceptable to the scientific society<sup>1</sup>. Kapalbhathi is a pranayama which is made up of two words 'kapal' in Sanskrit means forehead and 'bhathi' means shining. Kapalbhathi is a fast, rhythmic breathing using abdominal muscles. Pranayama has been shown to alter autonomic activity<sup>1</sup>. Prevalence of obesity in developing countries is believed to be on the rise<sup>2</sup>. Generalized obesity measured by Body Mass Index (BMI) is one of the major causes of ill health in the society. Obesity

is associated with the development of some of the most prevalent diseases of modern society, such as Type-II diabetes mellitus, hypertension, coronary artery disease, certain forms of cancer, arthritis, renal failure and gall bladder disease, and is associated with high morbidity and mortality<sup>2</sup>. Various measures with variable results are in use to reduce weight like dieting, hydrotherapy, steam bath, pharmacological therapy, surgical therapy, etc. This study was undertaken to see the effect of kapalbhathi pranayama on BMI and Abdominal Skinfold Thickness in overweight young adults.

### Materials and Methods

This study was conducted in a well-known tertiary hospital in Mumbai after the institutional ethical clearance. The participants of the study were the overweight resident doctors of age group 24 to 28 years of both sexes. Informed and written consent was taken from all the participants. The duration of the study was eight weeks. The resident doctors having BMI between 25 and 29.9, who do not have any acute illness, having normal cardio respiratory function and those who had not undergone any major surgery were included in this study. Those participants who were doing any other physical exercises, having cardio respiratory problems, acute illness, and those who had undergone any major surgery were excluded from this study.

The recruited participants were divided into study group and control group, each containing 30 individuals of both sexes. Body weight, height, BMI and abdominal skinfold thickness was assessed from all participants. Weighing scale

for measuring weight, standiometer for measuring height and skinfold thickness caliper for measuring skinfold thickness were used in the present study. Each individual from the study group was explained about the procedure of Kapalbhathi in detail and sufficient trials were given for proper understanding. Kapalbhathi was practiced by the subjects of study group for a period of 8 weeks regularly, Monday through Saturday under our direct supervision. At the end of 8 weeks parameters of the study were reassessed in both the study and control groups.

**Procedure of Kapalbhathi Pranayama**

Kapalbhathi should be practiced on empty stomach. Sit in comfortable crossed leg position or in any comfortable position with back straight, hands resting on knees. Kapalbhathi involves abdominal muscle contractions with forceful exhalation and natural inhalation. Exhalation and inhalation together constitute one stroke. One can begin with 15 such strokes. After completing such 15 strokes inhale and exhale deeply and take a rest pause of about 15 to 20 seconds. While performing Kapalbhathi, body should be steady. There should be no movement of head, shoulders, facial muscles, back and legs. Excess force and jerk should be avoided. This procedure was practiced for 15 minutes daily. Paired t-test was used to find out the statistical significance of the results. The p-value <0.05 was considered the level of significance.

**Results**

It is observed that body mass index and abdominal skinfold thickness is decreased in the subjects from study group as compared to that of control group at the end of 8 weeks.

**Table 1** and **2** show the BMI and abdominal skinfold thickness at the beginning of experiment and at the end of experiment (after 8 weeks).

**Discussion**

The pattern of body fat distribution is recognized as an important predictor of the health risks of obesity. Individuals with more fat on the trunk, especially abdominal fat, are at increased risk of obesity related health problems compared with individuals who are equally fat, but have more of their fat on extremities. The BMI is used to assess weight relative to height<sup>3</sup>. Skinfold thickness measurements can be used to estimate percentage fat mass<sup>4</sup>.

In present study, body weight, body mass index and abdominal skinfold thickness decreased significantly. Decrease in body weight causes change in body fat distribution<sup>5,6</sup>. Mauro Zamboni *et al* reported that weight loss is associated with changes in regional fat distribution<sup>7</sup>. So, fat redistribution after weight loss might be the cause for decrease in abdominal skinfold thickness in present study.

<b>Table 1</b> <b>Body Mass Index (Kg/m<sup>2</sup>)</b>		
	<b>Beginning of Experiment</b>	<b>After 8 weeks</b>
Control group (Mean ± S.D.) {N = 30}	26.98 ± 1.28	26.95 ± 1.31 (NS)
Study group (Mean ± S.D.) {N=30}	26.67 ± 1.09	25.28 ± 1.16 (HS)
S.D.- Standard deviation, N- No. of subjects, NS- Nonsignificant (p value>0.05), HS- Highly significant (p value<0.01)		

<b>Table 2</b> <b>Abdominal Skinfold Thickness (mm)</b>		
	<b>Beginning of Experiment</b>	<b>After 8 weeks</b>
Control group (Mean ± S.D.) {N= 30}	32.69 ± 4.82	32.68 ± 4.82 (NS)
Study group (Mean ± S.D.) {N=30}	32.44 ± 4.62	32.02 ± 4.62 (HS)
S.D.- Standard deviation, N- No. of subjects, NS- Nonsignificant (p value>0.05), HS- Highly significant (p value<0.01)		

The possible reason for the reduction of weight in present study: Kapalbhathi involves abdominal muscle contractions with forceful exhalation and natural inhalation. It is a form of abdomino-respiratory-autonomic exercise. Due to this, respiratory, abdominal and gastrointestinal receptors get stimulated. Also, afferents, centres in brain-stem and cortex and, afferents and effectors get stimulated. This leads to synchronous stimulation of autonomic nervous system, hypothalamus, pineal gland and other associated brain structures. Because of this there is synchronous increase in autonomic nervous system, pineal gland, hypothalamus and other central nervous system discharge to all parts of the body including endocrine and metabolic processes. This is responsible for the effect of Kapalbhathi on fat metabolism. This causes increase in basal metabolic rate, and because of this there is increase in calories consumption and decrease in fat deposition and so reduction in weight. This might be the possible reason behind reduction in BMI and abdominal skinfold thickness in present study.

Various studies have shown the effect of Kapalbhathi pranayama on obesity in the form of weight reduction. Nirmala N. Nayak *et al* reported that various yogasanas including Kapalbhathi seem to have a positive effect in reducing obesity<sup>8</sup>. Swami Ramdev mentioned that Kapalbhathi is helpful in reducing obesity<sup>9</sup>.

### Conclusion

From this study, it is concluded that Body Mass Index and Abdominal Skinfold Thickness show a decline after practicing Kapalbhathi pranayama. So, Kapalbhathi pranayama can be practiced regularly to reduce obesity.

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