

Yoga as Therapeutics in Obesity Management: An Observational Study

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ABSTRACT

Introduction: Excess fat accumulation in body, known as obesity, has many adverse health effects. *Yoga* has been proved to have both curative and preventive value.

Objective: To find out whether regular practice of *yoga* has any role in control of weight reduction and waist-to-hip ratio.

Materials and methods: Eighty subjects with 40 males and 40 females were included with body mass index (BMI) >30 and waist-hip-ratio (WHR) >0.85. Same were assessed after 12 weeks of *yoga* training comprising of various *asanas*.

Results: Body mass index of the male subjects decreased from 30.07±1.84 to 26.03±1.51 while of female subjects decreased from 30.29 ± 1.86 to 26.03 ± 1.51 while WHR of males decreased from 0.95 ± 0.02 to 0.89 ± 0.02 and of females decreased from 0.87 ± 0.01 to 0.83 ± 0.01 respectively after 12 weeks of *yoga* training.

Conclusion: Regular practice of *yoga* can be used as a therapeutic regimen for weight control and reduction.

Keywords: Body mass index, Waist-to-hip ratio, *Yoga*

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INTRODUCTION

Yoga is an ancient Indian art first brought to this country in the mid-1800s. In Sanskrit, the word *yoga* means “union” (with the Divine) and is a way of life involving a number of different spiritual practices and encompasses ethical conduct, social responsibility, nutrition, and physical health practices. Originally intended to prepare the body for Divine experience, it is practiced in our country for the achievement of physical strength, flexibility, and relaxation through postures known as *asanas* (*a-sa-nas*). *Pranayama* (*pra-na-ya-ma*), or breathing techniques, and meditation are also often practiced along with *hatha yoga*. The many forms of *yoga* practiced in the Western world are diverse in terms of focus, strenuousness, and applications. A few of the forms are *Anusara yoga* (Sanskrit for “flowing with grace”), *Kripalu yoga* (Sanskrit for “compassion”), *Iyengar yoga*, *Viniyoga*, *Ashtanga yoga*, and *Bikram yoga*. *Yoga* has been extensively studied both in India and the West, with thousands of studies reporting positive health effects, including lowering of blood pressure¹ and decreased cholesterol levels.² *Yoga* has been applied to programs for rheumatoid arthritis,³ osteoarthritis,⁴ chronic back pain,⁵ cardiac rehabilitation,⁶ carpal tunnel syndrome,⁷ and improved athletic performance.⁸ *Yoga* is increasingly being integrated into the office and inpatient settings by instructors who are experienced in teaching rehabilitation patients.⁹ According to the WHO, obesity is defined as body mass index (BMI) >30 and waist-hip-ratio (WHR) >0.9 in males and >0.85 in females, respectively. Excess fat accumulation in obesity has adverse effect on individual's health. Diabetes, hypertension, dyslipidemia, cholecystitis, coronary artery disease, some cancers, arthritis, and stroke are some of potential medical complications of stroke. Researches have shown that *yoga* has significant role in reduction of weight.

MATERIALS AND METHODS

This study was conducted in a tertiary care center of North India with 80 subjects of age between 20 years and 50 years, who were all obese

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as determined by their BMI and WHR. Inclusion criteria was BMI >30 and WHR >0.9 and >0.85 for males and females, respectively, who did not have any other significant comorbidity. Nature of the study was explained to them and a written informed consent was obtained. None of subjects had involved in athletics, sports, or any *yoga* training. Each subject acted as his or her own control since the parameters were tested in same subjects before and after intervention. Weight of each subject was noted prior to this study. A well-known *yoga* teacher instructed the subjects about the *yoga* training regime. The training program started with *Suryanamaskar* or Sun salutation. This was followed by *pranayamas* including *Bhastrika pranayama*, *Kapalbharti pranayama*, and *Anulom vilom pranayama* for 5 minutes each. This was followed by various *Asanas* that were *Halasana*, *Naukasana*, *Pawanmuktasana*, *Bhujangasana*, *Chakrasana*, *Matsyendrasana*, *Gomukhasana*, *Pashimottanasana*, *Tadasana*, and *Shavasana*. All *asanas* were performed for approximately 40 minutes. The session ended with OM chanting for 3 minutes. A detail of all these *asanas* and *pranayamas* is available in most of the standard books of *yoga*. The *yoga* teacher instructed all subjects to follow this *yoga* regime 6 days a week (except Sunday) at same time in morning under guidance. This training program continued for 12 weeks. The

BMI and WHR of each subject were measured again after completion of 12 weeks of *yoga* training.

RESULTS

Baseline characteristics of all subjects were matched in terms of the demographic profile and no significant difference was found (Tables 1 and 2). Before the *yoga* training program, the BMI of the male subjects was 30.07 ± 1.84 while of female subjects was 30.29 ± 1.86 that has decreased to 26.03 ± 1.51 and 26.17 ± 1.55 , respectively, after 12 weeks of *yoga* training (Table 3). Similarly before *yoga* training, WHR of males was 0.95 ± 0.02 and of females was 0.87 ± 0.01 that has decreased to 0.89 ± 0.02 and 0.83 ± 0.01 , respectively after 12 weeks of *yoga* training (Table 4). Maximum decline in WHR in males was more as compared to females (Fig. 1). But decline in BMI was almost same in both males and females (Fig. 2).

Table 1: Gender distribution of patients studied

Gender	No. of patients	%
Male	40	50.0
Female	40	50.0
Total	80	100.0

Table 2: Age distribution of patients studied

Age (years)	Gender		Total
	Male	Female	
<30	1 (2.5%)	1 (2.5%)	2 (2.5%)
30–40	25 (62.5%)	29 (72.5%)	54 (67.5%)
41–50	14 (35%)	10 (25%)	24 (30%)
Total	40 (100%)	40 (100%)	80 (100%)
Mean \pm SD	38.83 ± 4.09	37.15 ± 4.92	37.99 ± 4.57

$p = 0.102$

Table 3: Body mass index (BMI) (kg/m^2)—a comparison in male and female at baseline and 3 months of patients studied

BMI (kg/m^2)	Gender		Total	p value
	Male	Female		
Baseline	30.07 ± 1.84	30.29 ± 1.86	30.18 ± 1.84	0.590
3 months	26.03 ± 1.51	26.17 ± 1.55	26.10 ± 1.52	0.700

DISCUSSION

In this study, the *yoga* training regime was of sufficient duration and intensity to elicit significant changes in parameters tested. After 12 weeks of *yoga* training, we found that there was a highly significant decrease in BMI and WHR in both males and females groups. BMI is a simple and reliable index for classification of overweight and obesity according to body weight and height. According to the WHO, a BMI between $18.5 \text{ kg}/\text{m}^2$ and $24.9 \text{ kg}/\text{m}^2$ indicates normal weight, overweight between $25.0 \text{ kg}/\text{m}^2$ and $29.9 \text{ kg}/\text{m}^2$, and obese as $\geq 30.0 \text{ kg}/\text{m}^2$. The effect of *yoga* intervention in atherosclerotic patients was studied by Manchanda et al.¹⁰ and weight reduction of 6.8% ($p = 0.0019$) was found, which was consistent with our result. Schmidt et al.¹¹ and Calle-Pascual et al.¹² also found a significant decrease in BMI after *yoga* practice in obese subjects. The body composition, cardiac complications, and aerobic power were studied by Bera et al.¹³ and they found significant decrease in BMI after *yoga* intervention, which was again consistent with our result. Various postures and stretching exercises that help in strengthening the muscles and improving flexibility of body are included in *yoga asanas*. This involves gentle movements of body parts and isometric contraction of various muscle groups. Practically, every part of body is exercised in *asanas*. Considerable expenditure of energy and burning of calories may be responsible for weight decrease in these *asanas* and *pranayamas*.

CONCLUSION

This study clearly concludes that in obese and overweight individuals, regular *yoga* intervention for significant duration of time decreases BMI and WHR and therefore can be used as a therapeutic regimen for them.

Table 4: Waist-to-hip (WHR)—a comparison in male and female at baseline and 3 months of patients studied

WHR	Gender		Total	p value
	Male	Female		
Baseline	0.95 ± 0.02	0.87 ± 0.01	0.91 ± 0.04	<0.001*
3 months	0.89 ± 0.02	0.83 ± 0.01	0.86 ± 0.04	<0.001*

* p value significant

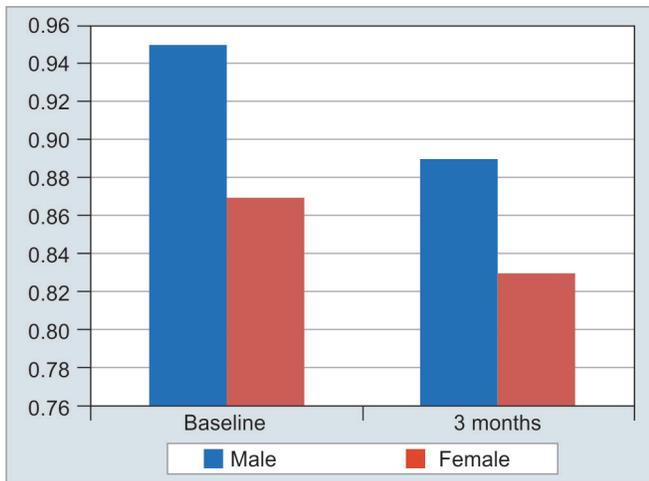


Fig. 1: Comparison of WHR before and after 12 weeks of *yoga* training

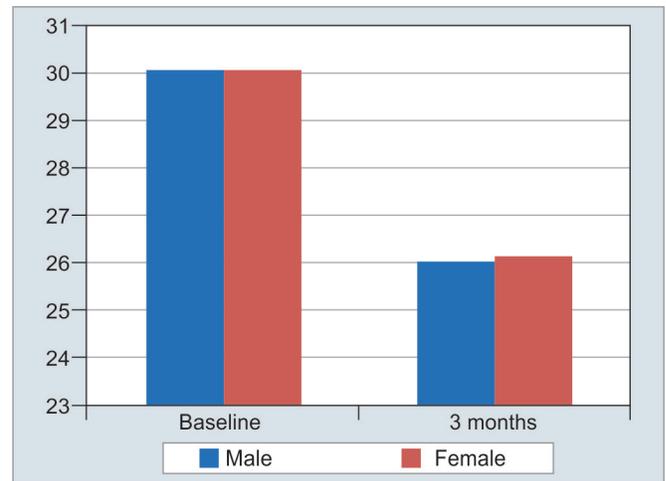


Fig. 2: Comparison of BMI before and after 12 weeks of *yoga* training

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