



Therapeutic Applications of Yoga for Weight Reduction in Obese Population: An Evidence-Based Overview

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Article History:

Received: 10-01-2015
Revised: 31-01-2015
Accepted: 02-02-2015
Published: 20-04-2015

Keywords:

Weight reduction, Sedentary lifestyle,
Yoga therapy, Self-introspection

Article code: OJMR111

Access online at: www.ojmr.in

Source of support: Nil

Conflict of interest: None declared

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Summary

Obesity is becoming a serious global health issue in developed as well as in developing countries including India. The main causes of obesity are overeating and decreased physical activity, which means the imbalance between the amount of energy intake and the energy expenditure. Obese persons may feel decreased energy level, breathing difficulties, excess sweating, problem in sleeping and back and joint pain. They may have an increased risk of developing type-2 diabetes, high blood pressure, heart and kidney related disease and asthma etc. Apart from this, individuals can also develop psychological problems such as stress, low self-esteem and depression. There are many complementary and alternative medicines (CAM) are available to manage such type of physical and mental conditions. Among the alternative therapies, yoga has an important role in the management of Obesity. Yogic management of obesity is based on controlled and balanced diet, yoga postures and breathing techniques. Yoga poses work on endocrine glands, improve blood circulation and improve body's metabolism. In this review article, evidence based therapeutic application of yoga therapy for managing obesity has been discussed.

Bhardwaj and Bhardwaj/ Yoga therapy for weight reduction in obese population

Background

Obesity is becoming a global serious health issue as well as a big social problem especially in developed countries [1]. Obesity can be defined as a condition where the body mass index (BMI) is higher than 30 [2]. People with BMI between 25 and 30 are considered overweight while those with BMI above 30 are considered obese. Body mass index is also known as Quetelet index. Body mass index is a number calculated from a person's weight and height and it can be considered as an alternative for direct measures of body fat.

Obesity is an increasingly common problem [3]. India is also following a trend of other developing countries that are steadily becoming more obese [4]. It's a common problem, estimated to affect around 1 in every 4 adults and around 1 in every 5 children aged between 10 and 11 in the United Kingdom [5]. Obesity leads to many psycho-somatic disorders and affects over the all parts of the population.

According to yoga, our present lifestyle is one of the most important factors behind all kinds of psycho-somatic disorders. In obesity, lifestyle is the determining factor or we can say the main cause of obesity is related to lifestyle. The first cause is overeating and the second is decreased physical activity, which means imbalance between the amount of energy intake and energy expenditure [6]. Apart from this, environmental factors, family influence, sedentary lifestyle and stress are the possible causes. Obese or overweight person may feel decreased level of energy, difficulties in breathing, excess sweating, and problem in sleeping and back and joint pain [3]. Apart from this, they may have an increased risk of developing type-2 diabetes, hypertension, heart disease, joints related problem, and asthma etc. Individuals can also develop psychological problems because of being overweight or obese like low self-esteem, poor self-image, low confidence level, feelings of isolation and these feelings may affect the relationships with family

members and peer groups and, if they become severe, may lead to depression [4].

Body Mass Index: - The WHO's definitions of 'overweight' and 'obese' are based on an individual's body mass index (BMI), which measures weight relative to height.

$B.M.I. = \text{Weight (in kilogram)} / [\text{Height (in meter)}]^2$

BMI according to World Health Organization [7]

Less than 18.5-underweight; 18.5-24.9-normal; 25-29.9-overweight; and more than 30-obese

BMI according to Indian Health Ministry [8]

Less than 18.4-underweight; 18.5-22.9-normal; 23-24.9-overweight; and more than 25-obese

Waist Circumference and hip circumference can also indicate the level of body fat.

Apple versus pear body shape

People having apple shaped body have body fat around the middle area of the body like around the abdomen, chest etc. The apple body shape is associated with different health problems such as coronary heart disease, diabetes, stroke, high blood pressure and gall bladder disease. People having pear shaped body have wider hips than shoulders because their bodies store fat on their hips and on their thighs. Having a pear body shape indicates a lower metabolic risk compared to an apple body shape.

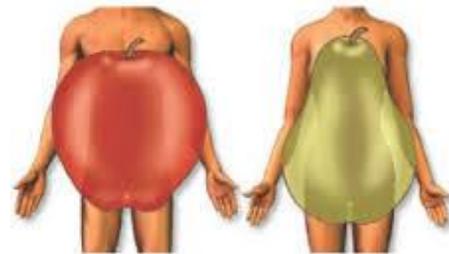


Figure 1: Apple versus pear body shape

Researches on yoga for managing obesity

Yoga is an ancient technique that always aimed to promote holistic living through better lifestyle, improved food habits and a physical regime. Yoga can play an important role in treating Obesity. Yoga techniques affect the internal organs, endocrine glands, brain, mind and other factors. Yoga has different effect on obesity, which is permanent in nature than other management techniques for weight reduction. Yoga works on all aspects of obesity such as physical, emotional and mental. *Asanas* strengthens the muscles, deep breathing while doing yoga reduces fat for bringing body weight to optimal level. Previous study has shown that after a week of yoga and a vegetarian diet camp, there was a significant decrease in BMI, lean mass, water content, waist circumference, hip circumference, total cholesterol, high density lipoprotein, and serum leptin level [9].

In a recent study three weeks of yoga or walking program with control diet on obesity was studied. The participants (ages between 20 and 55 years) were randomly divided into two groups: yoga and walking group (control) [10]. Yoga group practiced *asanas* (*Trikonasana*, *Konasana*, *Padhastasana*, *Uttanpadasana*, *Markatasana*, and *Savasana/ Yoganindra*), *pranayama* (*Bhastrika*, *Kapalabhati*, *Anuloma – Viloma*, *Bhramari*, and *Udgeeth*), and loosening exercises (*Sukshma vyayama*) while the walking group practiced walking (with OM chanting) at the same duration. Biochemical measurements (leptin, adiponection, and lipid profile), body composition, hand grip strength, stability, heart rate variability, respiration rate and health related measures were assessed before and after 3 weeks of interventions. Both groups showed an average weight loss of 4.5 kilogram. They were also convinced about healthy eating habits.

Another study was done to investigate the effect of 10 days yoga on self-control in obese women (average age 39 years). The participants practiced yoga one and half hour daily for 10 days and the practice included chanting, postures, breathing practices, cleansing practice and meditation. After analysis a non significant improvement was found but at the average it showed better impact of yoga on self-control. It

also showed a satisfactory decrease in average 1.3 kilogram in weight. This finding indicates the beneficial effect of yoga for weight-reduction in obese women to improve their self control [11].

A cross sectional study was conducted in rural community with 60 male and females (aged between 30 and 50 years) diagnosed with obesity according to the WHO criteria. Participants were divided into two groups by random sampling method and their BMI and pulmonary functions were measured. Group I practiced aerobic exercise that is walking and group II practiced *pranayama* and physical postures for one year (1 hour daily and 5 days per week). Statistical analysis showed the significant effect on all parameters in group II (yoga group) and it means regular practice of yoga is really helpful in weight reduction as well as the improvement in pulmonary functions [1].

Yoga therapy for obesity

Yoga therapy is based on balanced diet, with proper yoga postures or *asanas* and breathing techniques.

Sometimes the obese people have trouble with joint pain. Yoga can help by improving the body's alignment to reduce strain on joints by allowing the frame to bear more of the body's weight. It improves strength and flexibility. Yoga also develops the balance. Most importantly, yoga can help to feel better, both improving physical fitness and elevating mood. Regular practice of yoga has different effect on obesity, which is permanent in nature than other techniques for obesity reduction.

The dynamic series known as *Surya namaskara* is most important for the treatment of obesity. *Surya namaskara* is a complete practice in itself because it includes *asana*, *pranayama*, *mantra* and meditation. This practice has a unique influence on the endocrine and nervous system, helping to correct metabolic imbalances that cause and perpetuate obesity [12]. The *pranayama* practices recommended for obesity are also the more dynamic forms which stimulate the metabolism. These include: *Bhastrika*, *Kapalabhati* and *Suryabhedan*, which are performed along with balancing practices

like *Nadishodhana* and *Ujjayi* [12]. Regular practice of *pranayamas* helps burning fats.

The other *Hatha* yoga practices which are most helpful in obesity are the internal cleansing techniques. These include: *Shankha prakshalana* (cleansing of the entire alimentary canal), *Kunjla* (cleaning practice for the stomach), and *Neti* (cleansing of the nasal passages). These practices clean our body internally and keep it free from pollutants which are absorbed from different environmental sources.

According to Swami Satyananda, one of the most important meditation practices for obesity is inner silence. This is a technique of *pratyahara* (withdrawal of the senses) that helps to clean the mind of extra weight in the form of toxic thoughts. These thoughts manifest physically in the form of passivity or lack of activity and food habits that sustain obesity, and create an imbalance in the energy-saving and accumulating system [6].

Yoga can help to develop strong muscles, a flat stomach and a strong back along with improvement of posture [13, 14]. Of course, these physical changes are depends on other lifestyle factors, such as balanced diet and regular physical exercises. Most of the studies have shown significant weight loss by regular yoga practice. One study found that after three months, healthy adults lost an average of 6 kilograms. For weight loss program, all obese participants reached and sustained a normal weight with continued practice of yoga within 1 year and showed improvement in pulmonary function [15]. Yoga along with *pranayama* and Sun salutations can be used as complementary intervention in obesity for reduces the weight [16-19]. Although yoga may help in manage conditions comorbid with overweight and obesity, such as low back pain [20]. Incorporating yoga therapy in the treatment protocol of patients suffering from anxiety and depression is also beneficial [21].

Apart from these practices, food habit plays an important role. More raw vegetables, fruits help in balancing the intake of the food. Reducing refined and processed food, fast food, non-vegetarian diet helps in weight control. A

special fasting program has proven exceedingly helpful [22].

In short, for managing obesity *Surya Namaskara* (Sun salutation), *Pawan-Muktasana*, *Ardha-Halasanana*, *Setu Bandhasana*, *Ardha Naukasana*, *Bhujangasana*, *Shalabhasana*, *Dhanurasana*, *Parvatasana*, *Shashankasana*, *Yoga-Mudra*, *Ushtrasana*, *Kati Chakrasana*, *Tadasana*, *Vrikshasana*, *Utkatasana*, *Trikonasana*, *Shavasana* can be helpful. Each *asana* should be practiced 5 times with holding each position from 10-20 seconds in starting than gradually this time can be increased. One should relax between two *asanas* and practice should be under the guidance of an expert yoga teacher having adequate experience in yoga therapy.

Lack of self-control creates many imbalances in our lives [11]. But in yoga, therapy begins with self-awareness and self-introspection. This is the only way we can modify our lifestyle and give it a new direction [23].

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How to cite this article:

Bhardwaj, P. R., and Bhardwaj, A. K. (2015). **Therapeutic applications of yoga for weight reduction in obese population: an evidence-based overview.** *Online Journal of Multidisciplinary Research*, 1(1): 1-5.