



ORIGINAL RESEARCH PAPER

Yoga

EFFECT OF SURYANAMASKAR ON ANTHROPOMETRIC VARIABLE AMONG MIDDLE AGE HOUSEWIFE

KEY WORDS: BMI, waist circumference, hip circumference, mid arm circumference, waist-hip ratio, suryanamaskar

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ABSTRACT

BACKGROUND: In India, obesity is highly prevalent in women as compared to men. As the obesity epidemic spreads, there are growing concerns about efficient obesity management. Scientific studies have reported beneficial physiological changes after Suryanamaskar practice. As there are few studies on Suryanamaskar on Anthropometric variable, we conducted this study to determine the Effect of Suryanamaskar practice on Anthropometric Variable Among Middle Age Housewife. **OBJECTIVE:** The aims of the study was to test the effect of Suryanamaskar practice on anthropometric variables in middle age housewife. **MATERIALS AND METHODS:** The 40 participants were subjected to a 30 days of only suryanamaskar practice intervention for a 45 minutes a day. The assessment was done 1st day prior to intervention and on the 30th day post intervention. Anthropometric parameters assessed were BMI, mid-arm circumference, waist circumference, hip circumference and waist hip ratio. **RESULTS:** Significant reduction in BMI and waist circumferences. Moderate reduction in mid-arm circumferences, hip circumferences and waist hip ratio. **Conclusion:** The review presents that a 30 days Suryanamaskar practice brings a change in body dynamics and reduces different anthropometric measurements in middle age house wife.

Introduction

Anthropometric measurements are noninvasive quantitative measurements of the body. In adults, body measurements can help to assess health and dietary status and identify inadequate growth patterns that warrant further evaluation. One of the best clinical utilities of anthropometric data is to define obesity. Typical equipment list required to obtain anthropometric measurements includes: Weight Scale, Calibrations weights, Stadiometer, Knee caliper, Skinfold calipers, Nonstretchable tape measure, Infantometer to measure the recumbent length. BMI calculations and z-scores can help identify obesity and malnutrition in children, leading to early identification and treatment. Mid-upper arm circumference (MUAC) can help to define the severity of malnutrition. Although technology may eventually advance to replace anthropometry on some level, one study found that the anthropometric measures of waist and hip circumferences are superior to ultrasound to assess regional adiposity. This will help identify at-risk individuals early and help clinicians promote a healthy lifestyle for at-risk patients to avoid the well-documented adverse effects of obesity[1].

In India, obesity is highly prevalent in women as compared to men. Some evidence suggests that lack of physical activity rather than caloric intake is a major determinant of obesity[2]. Obesity comes with its own set of challenges. There is a detrimental impact on their social, psychological and intellectual status. Obesity leads to many diseases that affect women and raises the risk form many serious health problems such as Diabetes, Heart disease, High Blood Pressure, High Cholesterol, Breathing Problems, Many types of Cancer, Stroke and Pregnancy Problems[3]. Mostly housewife gains a lot of weight after child birth, marriage or after taking contraceptive pills and hormonal imbalance also make them being overweight or obese. Barriers that prevent housewives from trying to reduce weight include time, attitude, safety, environment and life issues such as finance and health problems[4]. Lifestyle disorders are being raised because of unbalanced food, sedentary lifestyle and stressful mental conditions. Consequently, over consumption of calories and reduced physical activity is the root cause of obesity. Non communicable

diseases currently cause almost two thirds of all deaths worldwide. Growing prevalence of obesity worldwide is an increasing concern surrounding the rising rates of Diabetes, Coronary and Cerebrovascular disease, stroke, heart failure, hypertension, fatty liver disease, sleep apnea, osteoarthritis and reproductive and gastrointestinal cancers that pose a big threat in terms of health and financial hazards for the entire population of the world[5][6]. It has been described in recent studies and reviews that there is a gradient between increasing BMI and costs attributable to obesity[7]. Looking at all the adverse effects of obesity there is need of sustainable and affordable solution to overcome the epidemic. Practice of Suryanamaskar provides numerous physiological and psychological benefits. Regular practice of SuryaNamaskar rewards a completely organic makeover.

Materials and Methods

Forty participants who had enrolled in a thirty days suryanamaskar practice program. Their ages ranged between 30 and 45 years (group average 36.15 years 40 females). We have fully explained the potential risks and benefits in the study before written informed consent was provided by participants, the study was approved by the ethics committee of the institution, Lakulish yoga university, located in Ahmedabad, Gujarat, India. The selection criteria included overweight and obese housewife in age 30-45 and are participated willingly and working women, underweight, pregnant and physically disabled women were excluded. In this study we adopted a convenient sampling to recruit the subjects who were going to participate for 30 days suryanamaskar practice at purvi residency, Ahmedabad. A single group pre-post design was used for assessment. The 30 days study was successfully completed by 40 participants.

Intervention

The intervention was designed keeping in view the experimental group by the researcher in consultation with the guide. Practice of Suryanamaskar was given to the subjects. One round of Suryanamaskar consists of twelve postures, one following another, in a fixed, cyclic order. Each posture of Surya Namaskar was given in a dynamic manner with focus on breathing pattern.

Prathanasana (Prayer pose) – 1st and 12th posture: Stand erect

with folded hands and placed close to the chest. The palms are held together in the form of prayer pose. Look straight. Exhale normally.

Hasta Uttanasana (Raised arms pose) – 2nd and 11th posture – Raise both the hands above the head. Inhale normally while raising the hands. Bend the trunk and neck slightly backward. Padahasthasana (Hand to Foot pose) – 3rd and 10th posture – Bend forward and try to touch the floor with both the hands. Exhale normally while bending forward slowly.

Ashwa Sanchalanasana (The Equestrian Pose) – 4th and 9th posture – Place the palms of the hands flat on the floor beside the feet. Stretch the right leg backward as far as possible. At the same time, bend the left knee, keep the left foot on the floor in the same position. Keep the arms straight. In the final position, the weight of the body should be supported by the hands, the left foot, right knee and toes of the right foot. The head should be tilted slightly backward, the back arched and the inner gaze directed upward to the eyebrow center. In position 9 the same should be performed with the left leg stretched and the right knee bend.

Parvatasana (The Mountain Pose) – 5th and 8th posture – While exhaling, take the right leg backward and place it parallel to the left leg. Raise the hips at the same time. Place the hands straight supporting the weight of the body. The head should be placed between the hands. Try to place the heels on the floor.

Ashtanga Namaskara (Eight-Limbed salutation) – 6th posture – Lower the body to the ground from Parvatasana pose in such a way that it touches the floor at eight locations – the head, the chest, the two palms, the two knees, and the two toes, Suspended the breath for a while. Try to lift other parts in air. Bhujangasana (The Cobra Pose) – 7th posture – Bhujangasana is also famous as a cobra pose in yoga. In this asana person's head and trunk resembles a cobra with raised hood, hence the name Bhujangasana. It appears as the 7th pose in the Surya Namaskara series asanas.

Outcome measures of Anthropometric variables

Body mass index - The body weight was measured using a electronic weighing machine and height was measured using a measuring tape. The body mass index was calculate as the body weight divided by square of the body height. Waist circumference, Mid-arm circumference and Hip circumference were measured using a measuring tape. Waist to Hip Ratio was derived with dividing the waist measurement by the hip measurement.

Data Analysis

The comparison of the pre-post net scores data of the suryanamaskar practice program was made using Excel and SPSS version 16.0.

Results

BMI: Body mass index changes after Suryanamaskar

Effect of Suryanamaskar practice showed that 5.2% significant reduction ($P < 0.05$) in Body mass index. [Table 1].

Table-1 : BMI Changes after Suryanamaskar practice

BMI scores	Suryanamaskar practice		% change	P- value
	Before	After		
	29.7 \pm 1.7	28.2 \pm 1.6	5.2%	0.05*

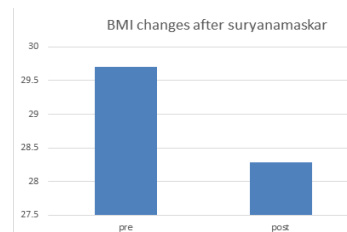
*significant at $P < 0.05$, ** significant at $P < 0.01$, ***significant at $P < 0.00$ (paired sample test and Wilcoxon Signed Ranks Test)

MAC: Mid arm circumference Changes after Suryanamaskar practice After Suryanamaskar practice it showed that 2.3% reduction in Mid arm circumference (in inches), But it is not statistically significant ($P > 0.05$). [Table 2]

Table-2: Mid arm circumference Changes after Suryanamaskar practice

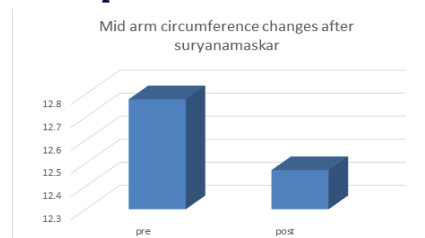
MAC	Suryanamaskar practice		% change	P- value
	Before	After		
Mid arm circumference	12.77 \pm 1.16	12.47 \pm 1.01	2.3%	0.1

Graph-1: BMI Changes after Suryanamaskar practice



*significant at $P < 0.05$, ** significant at $P < 0.01$, ***significant at $P < 0.00$ (paired sample test and Wilcoxon Signed Ranks Test)

Graph-2: Mid arm circumference Changes after Suryanamaskar practice



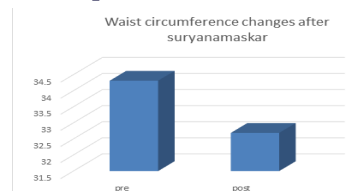
WC: Waist circumference Changes after Suryanamaskar practice After Suryanamaskar practice it showed that 4.8% significant reduction ($P > 0.05$) in Waist circumference (in inches). [Table 3].

Table-3: Waist circumference Changes after Suryanamaskar practice

WC	Suryanamaskar practice		% change	P- value
	Before	After		
Waist circumference	34.31 \pm 3.45	32.68 \pm 3.45	4.8%	0.05

*significant at $P < 0.05$, ** significant at $P < 0.01$, ***significant at $P < 0.00$ (paired sample test and Wilcoxon Signed Ranks Test)

Graph-3 Waist circumference Changes after Suryanamaskar practice



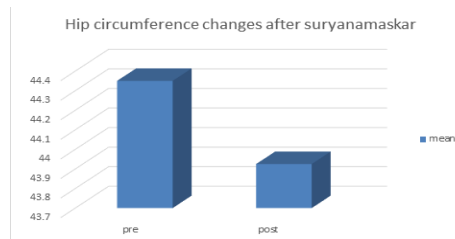
HC: Hip circumference Changes after Suryanamaskar practice After Suryanamaskar practice it showed that 0.9% reduction in Hip circumference (in inches), But it is not statistically significant ($P > 0.05$). [Table 4].

Table-4: Hip circumference Changes after Suryanamaskar practice

HC	Suryanamaskar practice		% change	P- value
	Before	After		
Hip circumference	44.35 \pm 5.24	43.92 \pm 5.03	0.9%	0.08

*significant at $P < 0.05$, ** significant at $P < 0.01$, ***significant at $P < 0.00$ (paired sample test and Wilcoxon Signed Ranks Test)

Graph: 4 Hip circumference Changes after Suryanamaskar practice



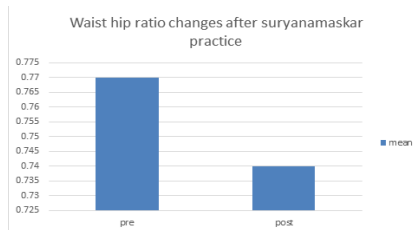
WHR:Waist Hip ratio Changes after Suryanamaskar practice
After Suryanamaskar practice it showed that 3.9% reduction in Waist Hip ratio, but it is statistically not significant ($P > 0.05$) [Table 5].

Table-5: Waist Hip ratio Changes after Suryanamaskar practice

WHR	Suryanamaskar practice		% change	P- value
	Before	After		
Waist hip ratio	0.77 \pm 0.05	0.74 \pm 0.05	3.9%	0.1

significant at $P < 0.05$, ** significant at $P < 0.01$, ***significant at $P < 0.00$ (paired sample test and Wilcoxon Signed Ranks Test)

Graph: 5 Waist Hip ratio Changes after Suryanamaskar practice



Discussion

The Current study had an daily practice of only 45 minutes, 6 days a week. The practice session is comprised only of Suryanamaskar and no other Asanas, pranayama, exercise, food and lifestyle modification was included. the results however are momentous. This evidences that even an 45 minutes of dedicated suryanamaskar practice can avail massive benefits in a span of 30 days. Hence we observed from the above discussions that regular practice of suryanamaskar if performed for a longer period of time can give miraculous results. Health is defined as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” according to the definition of WHO. The main purpose of Yoga is to achieve and maintain this state of health as defined. In contrast to all other Asanas which work on a particular part of the body, Suryanamaskar is a complete Health capsule for the whole body. Suryanamaskar is generally practiced as a capsule with other yogic practices like Asana, Pranayama, and meditation, and also food and life style modification is required, however, we limit our discussion to Suryanamaskar as the main practice. 45 minutes session of Suryanamaskar practice for 30 days in overweight and obese Middle age housewife, showed that 5.2% significant reduction ($p = 0.05$) in body mass index, 2.3% reduction in Mid arm circumference (inches), 4.8% significant reduction ($p = 0.05$) in Waist circumference (inches), 0.9% reduction in Hip circumference (inches) and 3.9% reduction in Waist Hip ratio. Conscious breathing helps not only in getting more oxygen to the body but also in breathing out carbon dioxide to the fullest possible capacity. The breathing component incorporated in suryanamaskar

serves this purpose by aiding the lungs to function to their maximum ability and naturally helps the practitioner to lengthen the inhalation and exhalation duration. The major way of eliminating toxins from the body is breathing out, which is corrected and enhanced by the continuous practice of Suryanamaskar. From the scientific point of view, it improves the metabolic functioning of the body and regulates the secretions of the glands. Therefore, it is very clear that the practice of Suryanamaskar helps in keeping the mental health and the equilibrium of the state of mind, as metabolism and glands directly affect the mind. The review presents the physical benefits of the practice with regards to the increasing mobility of joints, extending muscle power, and vitality with the literature reference. The physiological attributes of improving the metabolic rate, cardiovascular stimulation and increase of respiratory capacity, improvement of mental health of the body, and proper functioning of endocrine glands were also discussed. Highlighting the yogic point of view of the benefits of Suryanamaskar practice, the positive effects of Suryanamaskar on puberty, menstrual cycle, and childbirth were also emphasized[8]. The Sun Salutation poses help lose extra fat around the belly and let you stay in shape, naturally. These poses stimulate sluggish glands like the thyroid gland and induce it to increase hormonal secretions. Regular practice of SuryaNamaskar helps women regulate irregular menstrual cycles and assist in childbirth[9]. Surya Namaskar is a holistic exercise that gives daily dose of Vitamin D, flexibility training, cognitive boost, cardiopulmonary tuning, spinal adjustments, glucose metabolism and psychological wellbeing[10]. SuryaNamaskar is one complete set of sequential yoga posture that reaps the collective benefits of both strength and endurance training. Hence, it has been rightly called “Sarvang Sunder Vyayam”. Core Stability’ or the strengthening of the back muscles around the spine and the diaphragm is the objective of Kinesiology[11]. Alternating wide range of transition between flexion and extension during Suryanamaskar holds potential to increase mobility of almost all body joints by stretching anterior-posterior soft tissues and challenge postural balance mechanisms through a varying base of support[12]. The results of this study are too promising to be overseen. It would help Middle age Housewife include Suryanamaskar practice in their daily routine to have all round benefits for the Body, Mind, and Soul. We encourage those proactive interventions to be promoted with the time and resources necessitated.

CONCLUSION

Comparison of post scores with the pre scores showed significant improvement in BMI index reduces by 5.2% and Waist circumference (in inches) reduced by 4.8%. Moderate improvement seen in Mid arm circumference (inches) by 2.3%, .9% reduction in Hip circumference (inches) and 3.9% reduction in Waist Hip ratio. Therefore the review presents that a 30 days Suryanamakar practice brings a noticeable change in body dynamics and reduces different anthropometric measurements in middle age house wife in turn lead them to live healthy and pleasant life.

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CONFLICT OF INTEREST

None

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