

VOLUME 9 (SPECIAL ISSUE 2) 2023

ISSN 2454 – 3055

**Manuscripts under Special Issue are published under the
theme “Yoga Practices and Alternative Therapies on
Human Health”**

Guest Editor: Dr. S. Mohanasundaram

Assistant Guest Editors: Mrs. K. Geetha

Mrs. M. Pennarasi

**INTERNATIONAL
JOURNAL OF
ZOOLOGICAL
INVESTIGATIONS**

***Forum for Biological and Environmental
Sciences***

Published by Saran Publications, India



International Journal of Zoological Investigations

Contents available at Journals Home Page: www.ijzi.net

Editor-in-Chief: Prof. Ajai Kumar Srivastav

Published by: Saran Publications, Gorakhpur, India



ISSN: 2454-3055

Isolated Effects of Asanas, Mudras and Suryanamaskara on Fat Percentage Among Sedentary Obese People

Saheedha A.¹, Amala Karthiga G.² and Sunil Alphonse^{3*}

¹Faculty of Yogic Science and Therapy, Meenakshi Academy of Higher Education and Research, K. K. Nagar, Chennai 78, India

²Department of Tamil, Meenakshi Academy of Higher Education and Research, K. K. Nagar, Chennai 78, India

³Govt. College of Physical Education Kozhikode, East Hill, West Hill (PO), Kerala 673007, India

**Corresponding Author*

Received: 17th March, 2023; **Accepted:** 5th May, 2023; **Published online:** 25th May, 2023

<https://doi.org/10.33745/ijzi.2023.v09ispl2.003>

Abstract: When a person's food intake is greater than their energy expenditure, such as in the case of inactive persons whose daily energy demands are fulfilled by their food consumption alone, this condition is referred to as hyperphagia. The ancient practise of yoga, which has its roots in India, is one of the oldest practises in the world and is very beneficial for encouraging and maintaining both inner and outer development as well as one's physical health. There is no danger to public health that is more significant than that of obesity, which puts the health of billions of people at risk for a variety of diseases. The percentage of abdominal fat should be reduced to the desired level. Based on scientific knowledge and a literature review, we chose Suryanamaskara, Asana, Mudra, and Kriya as independent variables to create three yogic inventory. It has been shown that consistent practise of Suryanamaskara and other asanas over a period of twenty weeks results in a reduction in the percentage of body fat.

Keywords: Suryanamaskara, Asana, Mudra, Kriya, Obesity, Yoga, Hyperphagia, Body fat

Citation: Saheedha A. Amala Karthiga G. and Sunil Alphonse: Isolated effects of Asanas, Mudras and Suryanamaskara on fat percentage among sedentary obese people. Intern. J. Zool. Invest. 9(Special Issue 2): 11-16, 2023.

<https://doi.org/10.33745/ijzi.2023.v09ispl2.003>



This is an Open Access Article licensed under a Creative Commons License: Attribution 4.0 International (CC-BY). It allows unrestricted use of articles in any medium, reproduction and distribution by providing adequate credit to the author (s) and the source of publication.

Introduction

Obesity being the most dangerous public health issue that affects billions and predisposes to a variety of diseases. In 2014, 39 % adolescents and middle aged were under the risk of overweight and 13 percentage were under the condition of obese (WHO, 2015). The word obesity is derived from Latin word 'obesus' from 'ob' by reason of

and 'edo' means having eaten. The word obesity is referred to excessive states of overweight and is the clinical term used to describe this condition. The WHO defines overweight and obesity as abnormal or excessive fat accumulation that presents a risk to health. A body mass index (BMI) over 25 is considered overweight, and over

30 is obese (WHO, 2015). It happens when caloric intake surpasses calorie expenditure, such as in inactive individuals whose daily energy demands are exceeded by their food consumption (Anheyer *et al.*, 2021).

Yoga is one of the oldest known disciplines with roots in India, and is extremely valuable for keeping and maintaining biological and physiological health, as well as spiritual progress. Yoga is thought to have been practiced from the beginning of civilization. Yogic Asanas may be performed by both young and old people. Furthermore, Asana practise can be done by the practitioner alone or as part of a team in a group. Based on scientific understanding and a survey of related literature, the researcher selected Suryanamaskara, Asana, Mudra, and Kriya as independent variables to build three unique Yogic inventories for this study.

The purpose of the study was to find out the effects of different yogic practices on Fat Percentage of Sedentary people. The study was also aimed to answer - (i) Is there a positive effect due to different yogic practices on Fat Percentage among sedentary people?; and (ii) If there is a positive effect, which yoga intervention will have the most significant impact on the Fat Percentage?

The study has been delimited to the following factors: (i) Ninety- six Sedentary people from Government offices in the Kannur district; (ii) People having waist circumference above 36 inch; (iii) People who are medically fit to undergo Yogic programme; (iv) The dependent variables selected for the study is Fat percentage; and (v) The independent variables selected for the study is Suryanamaskara, Selected Asanas and Mudras.

There would be a substantial difference in fat percentage between experimental groups of sedentary adults and the control group after 20 weeks of varied yoga interventions. The significance of this study are - (i) The study helps in determining the effect of various types of Yogic practices on abdominal obesity and abdominal

endurance in sedentary adults; (ii) The three training programmes' effects may be compared; (iii) If there is an improvement, this programme can be implemented on a regular basis across working groups; and (iv) Pleasant improvements in posture will boost job efficiency and contribute to a positive mindset.

Materials and Methods

A survey was conducted at several offices in Kannur District to measure employees' waist circumference, weight, and height. 964 Sedentary people with a waist circumference more than 36 inches were identified from the data. 125 participants agreed to take part in a 20-weeks yoga programme. The study's ninety-six inactive adults (N=96) with waist circumferences more than 36 were chosen using a random sample procedure. All the subjects had never received any type of physical exercise training previously, and were divided into four equal groups. Treatment group I (Suryanamaskara) (n =24), treatment group II (selected Asana) (n =24), treatment group III (Mudra and Kriya) (n =24), and control group (n =24). For twenty weeks, treatment groups engaged in various yogic practices, with instruction provided six days a week. The draw of lots approach was used for random allocation. Furthermore, the design adopted in this study aided the researcher in gathering data for the research task on time. The data for the study were gathered using conventional techniques. Pre-tests were administered prior to the study, and post-tests were administered at the end of the six five-month study for all three experimental groups and one control group. The acquired data was statistically analysed using relevant techniques using SPSS 27.

Test administration:

Purpose: To measure the abdominal fat percentage

Equipment: Calipers of superior grade (e.g. Lange or Harpenden)

Procedure: While the subject is relaxed, a fold of

skin to the right of the umbilicus is firmly grabbed between the thumb and index finger of the left hand (approximately 8 cm apart on a line perpendicular to the long axis of the site) and lifted away from the body. A little muscular contraction of the person or a finger roll of the fold guarantees that subcutaneous tissue, not skeletal muscle, is assessed. For obese people, a large grabbing area (i.e. >8 cm) may be required, which may surpass the caliper's measurement capacity. The jaws of the calliper are positioned over the skinfold 1 cm below the tester's fingertips while the calliper is facing up.

Scoring: The calliper grip is let go, and the measurement is taken within three seconds. For uniformity among measurements, all measurements are taken in duplicate or triple to the nearest 0.5 mm. A fourth measurement may be required if there is more than a 3 mm gap between readings.

Statistical Techniques:

For doing a Parametric test, the variables have to follow some assumptions these are:

- (a) Dependent values are independent and taken from a random sample.
- (b) The dependent variable must be assessed on intervals or ratio scales
- (c) The variable must have a normal distribution.
- (d) The variance of the dependent variable should be similar between the different samples or group.

(a) *Assumption one* is satisfied because the recruitment of the subjects for the study is based on random sample and the total 96 participants were assigned random numbers from a standard table then They were randomly assigned to one of four equal groups: Suryanamaskara (SNG), Selected Asana (SAG), Mudra and Kriya (MKG), and Control Group (CG).

(b) *Assumption two* also satisfied because the waist circumference is measures in centimeters which is a ratio scale.

(c) *Assumption three Normality of Data:* To find the normality of the score of dependent variable Skewness and Kurtosis is checked separately.

(d) *Assumption four Homogeneity of Variance:* This is determined by running Levine's test in SPSS. The researcher plotted the Box and Whiskers plot Graph to provide graphic proof of variance homogeneity.

ANCOVA was done to check the significant difference from pre- to post-test scores among all four groups. . Since the obtained p value is less than 0.05, $p < .05$, in case of all dependent variable, Post hoc has been administered to analyze the pair wise comparison between all groups, further to find out which pair shows significant difference. Bonferroni Post hoc test in SPSS 27 version were used (Martin and Candow, 2019).

Results and Discussion

Table 1 illustrates that the skewness is 0.318 and the kurtosis is -0.649. The skewness and kurtosis falling within -2 and +2, which indicates that the distribution is normal.

It is evident that most of the distributions of pre-test score of fat percentage are falling appropriately within the normal curve which indicates the score are normally distributed. Hence, we can proceed to check homogeneity of variance. The total subjects were divided into four equal group by simple random sampling. Then Levene's test of homogeneity was administrated (Hruby and Hu, 2015).

Table 2 displays homogeneity of variance between pre-test scores of all four groups. Since $F_{0.05}(3, 92) = 0.273$, Null Hypothesis, H_0 is retained and concluded that the groups are homogeneous.

Figure 2 displays the distribution of variance across the groups. It is evident that the variance in all four groups is homogeneous.

Table 4 displays that difference between the Suryanamaskara and selected Asana group is -2.30 and the p value < 0.01 , so significant

Table 1: Descriptive statistics of fat percentage score of all the samples

Score	N	Mean	SD	Min	Max	Range	Skewness	Kurtosis
Pre- test	96	32.28	1.51	30	36	6	0.318	-0.649

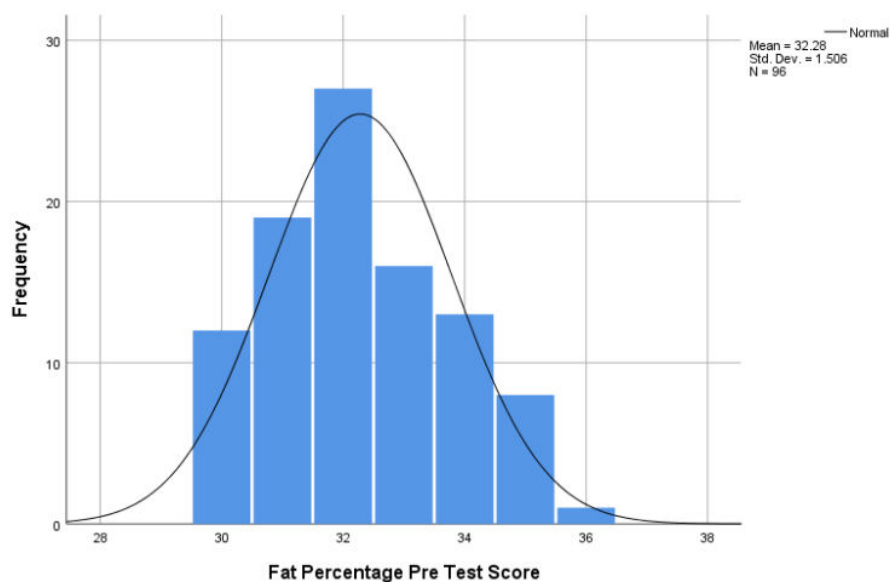


Fig. 1: Normality score of fat percentage in all four groups.

Table 2: Levene's homogeneity of variance of fat percentage between all four groups

Variable	df between	df within	F ratio	p value
Fat Percentage	3	92	1.320	0.273

$F_{0.05}(3, 92) = 0.273, p > 0.05$

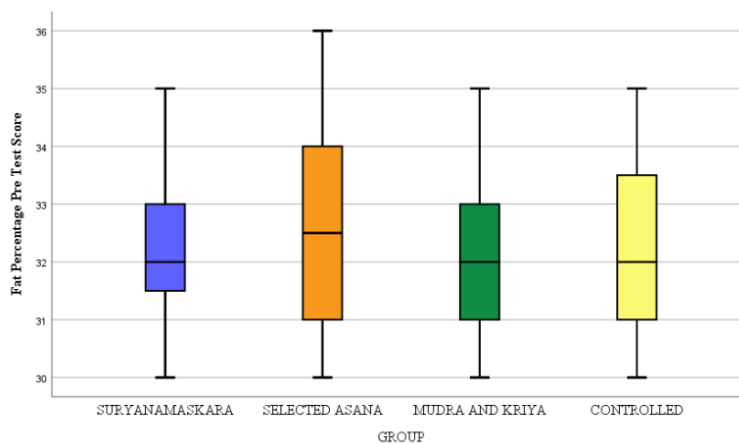


Fig. 2: Box and whiskers plot showing homogeneity of variance of fat percentage scores of all four groups.

Table 3: Analysis of covariance on fat percentage between groups

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Pre-test	65.85	1	65.85	20.73	0.00**
Group	165.35	3	55.12	17.35	0.00**
Error	289.06	91	3.18		
Corrected Total	519.33	95			

F0.05 (3,91) =17.35**, p = 0.00, p<0.01 ** ; Dependent variable: Fat Percentage Post Test Score. In table 5, mean fat percentage [F (3,91) = 17.35, p=0.00**] between all four groups.

Table 4: Bonferroni post hoc test showing pair wise comparison of adjusted mean scores on fat percentage between all four groups

SNG	SAG	MKG	CG	MD	p value
28.77	31.06			-2.30	0.000**
28.77		31.57		-2.80	0.000**
28.77			32.27	-3.50	0.000**
	31.06	31.57		-0.50	1.000
	31.06		32.27	-1.20	0.131
		31.57	32.27	-0.70	1.000

**Significant at 0.01 level

difference exist.

The difference between the Suryanamaskara and the Mudra and Kriya group is -2.80 and p < 0.01, so there exists a significant difference at 0.01 level.

The difference of adjusted mean after treatment among the Suryanamaskara and the control group is -3.50 and p < 0.01, which shows there is significant difference among the groups.

The difference of adjusted mean after treatment among the selected Asana and Mudra and Kriya group is -0.50 and p > 0.05, which is not significant among the groups.

The difference of adjusted mean after treatment among the selected asana and the control group is -1.20 and p value is 0.131 (p>0.05) which is not significant at 0.05 level.

The difference of adjusted mean after treatment among the Mudra and Kriya and the control group is -0.70 and p > 0.05 which is not significant at 0.05 level.

Table 1 displays normality test for the pre-test data of all sample. It is evident that the scores of all three-treatment group and the control group satisfied Normality.

Table 2 Levene's homogeneity of variance displays the variances of all four group on scores of fat percentage are homogeneous, that is why the researcher choose parametric test, ANCOVA for interpreting the data, analyzing the scores and concluding the results.

Table 3 uses adjusted post-test mean of fat percentage for the calculation of ANCOVA. Pre-test score of fat percentage of all four groups are used as co-variate for the calculations. From the table it is evident that the adjusted post mean of fat percentage in all three treatment groups are much lower than the control group.

Table 4 illustrates the result of Bonferroni post-hoc test to find the pairwise comparison of the four groups. Treatment group I Suryanamaskara and treatment group II selected Asana reduces fat percentage considerably. It

means by practising Suryanamaskara or selected Asana for a period of twenty weeks can reduce fat percentage. This result supports the study conducted by Mody (2011) and Cramer *et al.* (2016).

There would be a substantial difference in fat percentage between experimental groups of sedentary adults and the control group after 20 weeks of varied yoga interventions. The hypothesis assumed there will be difference between different groups on fat percentage. From Tables 3 and 4, it is evident that there is a significant difference in fat percentage. Hence, hypothesis is retained.

Conclusion

It is concluded that all three yogic interventions administered in this study can be used for the reduction of fat percentage. The effect of suryanamaskara is more followed by selected Asanas, Mudras and Kriya group also showed significant changes in reduction of waist circumference but compared to other two treatment groups the changes is least. Practicing Suryanamaskara or selected Asana for a period of twenty weeks can reduce fat percentage.

The results of the study provide a message that Yogic practices has a positive effect in reducing abdominal obesity and enhance abdominal endurance of secondary people hence in the light of the conclusion the following

recommendations are made: (i) Extended duration of different yogic practices can be done to gain greater insight; (ii) Other Yogic practice can be used as independent variable to for the same dependent variables for obese population; (iii) All yogic inventories used in this study is cost effective, safe, and feasible, so it is strongly recommended for all people; and (iv) These healthy yogic practices can be done along with medical treatments, under the supervision of a yoga expert.

References

- Anheyer D, Koch AK, Thoms MS, Dobos G and Cramer H. (2021) Yoga in women with abdominal obesity – Do lifestyle factors mediate the effect? Secondary analysis of a RCT. *Complementary Therapies Med*. 60: 1 -5.
- Cramer H, Thoms MS, Anheyer D, Lauche R and Dobos G. (2016) Yoga in women with abdominal obesity— a randomized controlled trial. *Deutsches Ärzteblatt Int*. 113(39): 645-652.
- Hruby A and Hu FB. (2015) The epidemiology of obesity: A big picture. *Pharmacoeconomics* 33(7): 673-689.
- Martin AC and Candow D. (2019) Effects of online yoga and Tai Chi on physical health outcome measures of adult informal caregivers. *Int J Yoga* 12(1): 37-44.
- Mody BS. (2011) Acute effects of Surya Namaskar on the cardiovascular and metabolic system. *J Bodywork Movement Therapies* 15(3): 343-347.
- WHO. (2015) Obesity and overweight Fact sheet N°311. January 2015.