

# ASSESSMENT OF YOGA TECHNIQUES ON PHYSICAL AND PSYCHOLOGICAL STATUS OF MIDDLE-AGED PEOPLE

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## Abstract

Yoga represents the mind-body training that involves various body posture, breathing techniques and meditation. Nowadays, yoga has been most widely practiced involving the different asana or posture control mechanisms as well as pranayama or manipulation of respiration. Furthermore, in case of abdominal breathing with voluntary active control, Hatha yoga can offer an effortless and stable body position along with the posture coordination (such as stretching and balancing). This study shows the importance of yoga in reducing the anxiety, depression and stress. In addition, it can enhance the apparent self-efficacy in healthy persons. Yoga also positively effects on the psychological condition of an individual. This paper offers the influence of yoga on the body profile of an individual such as fasting blood glucose, high-density lipoprotein, triglycerides and total cholesterol. The procedure involves the selection of middle-aged people with their significant health measurements. It shows the significance of various yoga techniques that positively influence the internal organs, mind, endocrine glands and even the entire body. This paper presents the importance of yoga in daily human life that can effectively work for weight reduction, meditation, flexibility improvement and stress removal.

**Keywords:** Yoga, Asana, Pranayama, Body posture, Body weight, Stress.

## INTRODUCTION

Yoga representing an ancient Indian science stream for spirituality and health. It enables the health improvement with respect to life quality to the physician by refining the psychological and physical health by balancing between emotions, mind and human body. Yoga involves the practice of shuddhi kriyas, bandha, mudra, pranayama, meditation and asana. While, the hatha yoga can improve the entire features of physical and health performance. Yoga with regular practice can modulate and improve the biochemical profile, physical performance, muscular efficiency and cardiopulmonary function of an individual (Seo, et al., 2012). Yoga has also the potential to the entire workout performance by regulating the cardiovascular and anaerobic power, metabolic rate, heart rate, pulmonary function and relaxation (Lee, Kim, & Kim, 2012). Furthermore, yoga could also be beneficial in relaxing the perception of stress as well as physical symptoms with respect to the other physical training sessions. Yoga practices, especially of pranayama and asana has a great impact on the physical fitness development by enhancing the neuromuscular functioning as well as cardiorespiratory endurance (Littman, et al., 2012).

In last decades, several research work have been reported on the impact of yoga package that involves certain meditation techniques along with various asana, pranayama and shuddhi kriyas, Various volunteers show their physiological health who are belonging to a definite age group (Aune, et al., 2017). A methodical research work taking into account the physiological impact of a certain yoga training sessions on the population of various age groups from same professional background is still an untouched place to commence (Bahrainy, Levy, Busey, & Caldwell, 2016).

Under such condition, an attempt has been made in this current research work to see whether a certain yoga training exercise could help in improving the anthropometric features such as muscular strength as well as flexibility of healthy people from various age groups from same professional skill (Bhattacharyya, Andel, & Small, 2021). The obtained information from the current research work might be beneficial in detecting the capability of a certain yoga practices for the development physiological/physical inactive health of people from various age groups (Chobe, Chobe, Metri, Patra, & Nagaratna, 2020).

The factors taken into account in the current study to analyze the anthropometric features such as flexibility and muscular strength and flexibility are globally recommended as well as cited to the others who want to analyze the flexibility, strength and physical fitness of the individual (Hoy, Osth, Pascoe, Kandola, & Hallgren, 2021). Thus, this study involves such factors to assess the physical condition of sedentary people of middle-aged group.

A significant objective for middle-aged people is to live and enjoy an independent life. Yoga has offered several health benefits such as:

- (1) Improved quality of life;
- (2) Improved from various sleep disturbances;
- (3) Reduced pain;
- (4) Improved symptoms from anxiety and depression; and
- (5) Reduced blood glucose for type 2 diabetic people.

Yoga comprises the emotional, mental and physical dimensions to encourage a good health. Several individuals choose to adopt yoga practice due to its simplicity and easy to learn. Yoga can be efficiently performed in a thin space without special tools. Further, several age groups can perform it to manage a good health (Hornstrup, et al., 2018). Conversely, few research work have stated that the amount of yoga practice as a physical activity does not fulfill the recommendations in order to promote cardiovascular health. Also, yoga has not influence the body composition (Hoy, Osth, Pascoe, Kandola, & Hallgren, 2021). However, several studies provide the outcome associated with the yoga practice, including the difficulty due to the variability in the training with their impact on physical health-related constraints (Seo, et al., 2012) (Ye, Chen, Shen, Chen, & Xu, 2020). Therefore, studies require to show the impact of yoga training on physical health via meta-analysis.



(a)

(b)

Fig. 2(a)(b). Various Yoga techniques performing by the middle-aged men

The research also explains the contribution of several meta-analysis studies about the impact of yoga practice with its progression. Several yoga research work are concentrating on the training impact of yoga, rheumatoid osteoporosis as a pain relief, improvement of cardiovascular function, positive impact on mental health and cognitive function, lowering of blood pressure, diabetes improvement and breast cancer improvement (Hornstrup, et al., 2018) (Littman, et al., 2012). Laughter yoga and Thai yoga practices can positively affect the physical fitness. However, prior meta-analyses involve several methodologies without any reporting on the physical fitness of elderly people. In case of elder people, physical fitness is closely associated with the potential to do daily activities independently, risk of falls and their physical health. Thus, it becomes necessary to monitor the impact of yoga training on individuals form the middle-aged group.

## MATERIALS & METHOD

### a) Subject Selection

The investigational study involves visiting at several institutions that are Andhra University Affiliated Colleges from the districts of Visakhapatnam, Vijayanagaram and East Godavari. This study particularly involves the middle-aged people (with their permission) in between 35-40 years old. As a subject, 240 people gave their voluntary consent for participation. Medical examination was performed in Andhra University on the all participants under the supervision of a qualified doctor. Out of them, 198 participants were found fit for this examination. Lot method is used for the selection that can randomly divide them into two experimental groups and one control group. Investigators properly gave instructions and the entire process in advance to the all subjects. Furthermore, the entire data about the participants is confidential.

### b) Variable Selection

Universally, numerous constraints are responsible for the health related problems with their risk. Such risk factors can be either curable or incurable depending on the disease and human health. Some of the factors that cannot be changed are age, gender, race and hereditary. While, psychological stress, physical inactivity and over eating are few factors that can be consciously adapted according to the related health hazards. Sheer determination of anyone can prevent from such health hazards. Next task is to identify the risk factors that may be changed due to yoga practice. Body mass index (BMI) and percentage of body fat are the body composition measures.

### c) Test Items

Primarily, the current study analyses the yoga efficiency on chosen biochemical/physiological variables and body composition measures. Deurenberg et al. formula is used to measure the percentage of body fat (in %), while Quetelet index can measure the body mass index (in Kg/m<sup>2</sup>).

### d) Subjects Orientation

Participants have right to know about the whole test procedures conducted by the Staff of Andhra affiliated University. Yoga practices help the participants in curing their disease if they perform them according to the training schedules. Control group was advised not to do any specific training or exercises related to yoga. Furthermore, good-orientation and co-operation were given to the participants during the entire examination.

### e) Data Collection

As per the rest administration, investigators collect the data for biochemical/physiological variables and body composition measures one day before as well as after the commencement of practice session. Each subject provided the 10 ml of blood sample by using venous puncture method and further stored in small bottles consisting heparin.

### f) Tester Reliability

Before the examination, investigator learnt and gone through several professional testing and training procedures under the guidance of national as well as international experts. Under the supervision of a biochemist and two lab technicians, assessment has been made for fasting blood glucose, high density lipoprotein, triglycerides and total cholesterol.

### g) Instrument Reliability

This study involves the usage of all the standard instruments for the measurements. There is no functional defect with zero error. Each instrument was tested many times before the examination. A physician has measuring tapes, Skinfold calipers and other necessary tools for the diagnosis of participants. A certified laboratory provides the participant's profile. While, the high quality of auto analyzer and centrifuge are used with excellent accuracy.



Fig. 1. Measurement of body weight.

## EXPERIMENTAL DESIGN AND STATISTICAL ASSESSMENT

The procedure involves a similar technique used by the random group design including 45 participants that were separated into three groups such as control group, Andhra University Staff yoga practice group (AUSYPG) and Andhra University Affiliated College group (AUACG). The participants of all the three groups were going through the pre-test and post-test examination. The in between duration between a pre-test and post test is of twelve weeks. The examination has selected dependent variables such as fasting blood glucose, high density lipoprotein, triglycerides, total cholesterol, breath holding time, resting pulse rate, blood pressure (diastolic/systolic), body mass index (BMI) and body fat percentage.

Prior to experimental treatment, three groups provide the data as the pre-test information to initiate the process and give the right direction to the study. After twelve weeks, investigators statistically examine the selected criterion variables from yoga practice. The data has the application of analysis of covariance (ANCOVA) and provide the significant difference. All cases have a fixed 0.05 level of confidence as no attempt was made to equate the groups in any manner. Scheffe 'S' test was considered whenever the 'F' ratio for adjusted test was estimated to be significant for adjusted post-test means. The paired mean differ significantly as a post-hoc test to determine. Some of the significant test administration are Body Mass Index (BMI) and Percentage of Body Fat.

BMI represents the human body weight (in Kg) that is divided by the square of the human height (in m). It is utilized in the analysis of human body as an underweight or obesity. While, percentage of body fat can be represented as;

$$\text{Adult Body Fat \%} = (1.20 \text{ BMI}) + (0.23 \text{ Age}) - (10.8 \text{ gender}) - 5.4$$

Where, the value of gender is Male = 1, Female = 0.

## RESULT & DISCUSSION

The data reliability depends on the test and re-test method. The Univariate co-efficient technique can provide the data reliability. Table 1 shows the selected criterion variables used by univariate co-efficient.

Table 1 Selected Criterion Variables with their R value

Variables	R value
Body Fat Percentage	0.94*
Body Mass Index	0.99*

\*Significance at 0.05 level of confidence. (Table value required for the significance at 0.05 level of confidence with df 9 is 0.767.

The main objective of this research is to evaluate the impact of Andhra University Affiliated Colleges Staff of yoga practice with respect to the Andhra University Staff. This research uses many yoga methodologies on several human physical variables in between middle-aged men. The detailed analysis is shown in Table 2.

Table 2 Covariance Assessment on the Body Fat Percentage in between the three groups

	AUSYPG	AUACG	Control Group	SOV	Sum of Squares	Df	Mean Square	'F' ratio
Pre-Test mean SD	26.659 3.125	25.979 2.4410	25.9999 2.485	B W	4.546 304.547	2 42	2.271 7.231	0.313
Post-Test mean SD	25.979 2.4410	25.135 2.5313	26.585 2.4165	B W	15.757 293.99	2 42	7.887 7.01	1.126
Adjusted Post-Test Mean	25.468	25.359	26.780	B W	19.147 5.980	2 41	9.578 0.148	65.692*

\*Significance at 0.05 level of confidence

(The table value were required for the significance at 0.05 level of confidence with df2 and 42, 2 and 41 were 3.21 and 3.22 respectively)

Table 3 Scheffe S test for the difference among the adjusted Post-Test mean of body fat percentage

Adjusted Post-Test Mean				
AUSYPG	AUACG	Control Group	Mean Difference	Confidence interval at 0.05 level
25.468		26.780	1.312	0.3540691
25.468	25.359		0.109	0.3540697
	25.359	26.780	1.427*	0.3541698

\*Significance at 0.05 level of confidence

As shown in Table 2 and 3, the pre-test means on body fat percentage in between the three different groups that are AUSYPG, AUACG and Control Group were  $26.659 \pm 3.125$ ,  $25.999 \pm 2.4410$  and  $25.999 \pm 2.485$ , respectively. The value of 'F' ratio is 0.313 for the pre-test score of all the three groups that is lesser than the required table value of 3.21 for the significance with df 2 and 42 at 0.05 level of confidence. The post-test means on body fat percentage in between the three different groups that are AUSYPG, AUACG and Control Group were  $25.9042 \pm 2.9589$ ,  $25.135 \pm 2.5313$  and  $26.585 \pm 2.4165$ , respectively. The value of 'F' ratio is 1.126 for the pre-test score of all the three groups that is lesser than the required table value of 3.21 for the significance with df 2 and 42 at 0.05 level of confidence. The adjusted post-test mean values of AUSYPG, AUACG and control groups were 26.548, 26.454 and 27.652, respectively. The obtained 'F' ratio value of 66.234 for adjusted post-test scores of AUSYPG, AUACG and control groups was greater than the required table value of 3.22 for the significance with df2 and 41 at 0.05 level of confidence.

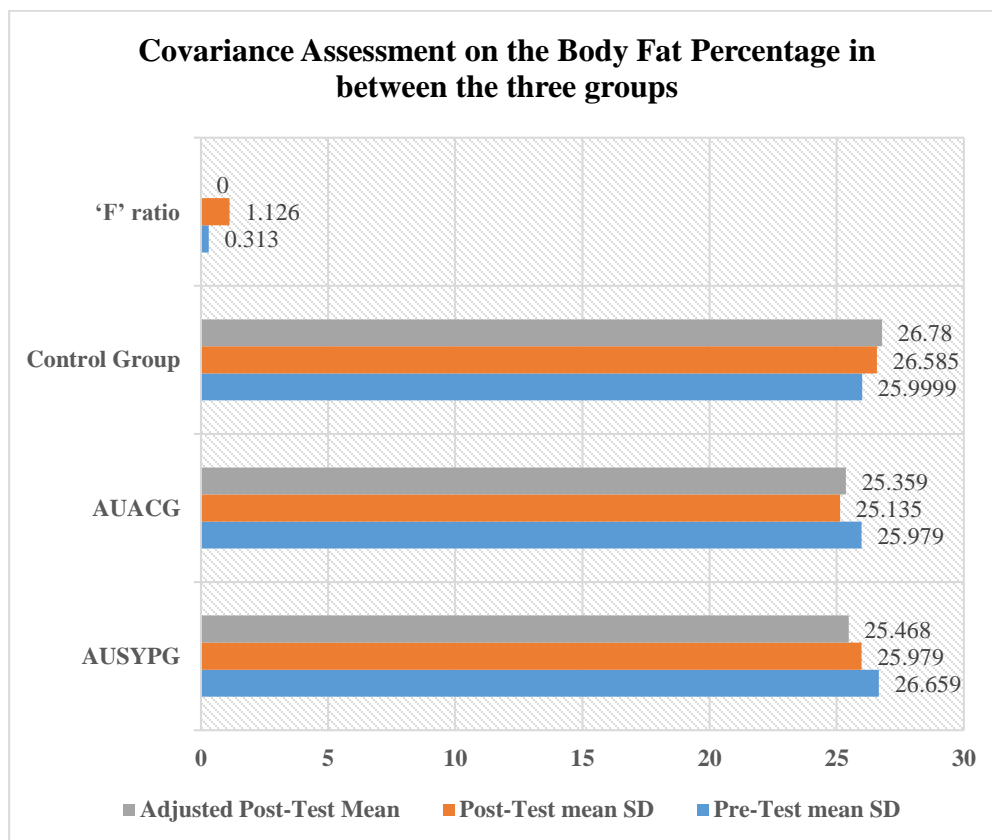


Fig. 1. Graphical representation of data analysis among pre-test and post-test outcomes

## CONCLUSION

This paper has the main objective to evaluate the relationship between the using of yoga techniques with the body fat percentage in middle-aged people. The study has provided the impact of yoga practices on certain biochemical/physiological variables and body composition measures between middle-aged men. The participants have categorized into three different groups such as AUSYPG, AUACG and control group. According to the results, the conclusion is that there was a significant reduction in the body fat percentage after participating and doing the yoga practices. There was a substantial positive change in body fat percentage because of regular yoga practices with different techniques for 6 days per week up to the next 12 weeks. Thus, it is recommended to perform constantly the yoga training, so that the other human measures can also be positively influenced (Rioux & Ritenbaugh, 2013) (Patil, et al., 2020). As the future scope, the diet can also be considered as one of the significant control variables in order to observe the impact of nutritional value. Research studies can be related with the neurological issues (Rioux & Ritenbaugh, 2013) (Littman, et al., 2012). Yoga practices can also be related with endurance, strength and speed variables.

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