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Effects of suryanamaskara, aerobic and united suryanamaskara and aerobic training on body composition parameters of women

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Abstract

The purpose of the study is to find out the effects of suryanamaskara, aerobic and united suryanamaskara and aerobic training on the Body composition parameters of women. For the present study, sixty (N=60) women students were selected at random, and their age ranged from 18 to 21 years. Subjects were randomly assigned into four equal groups of fifteen (n = 15) each. Group I underwent suryanamaskara training, Group II underwent aerobic training Group III underwent united suryanamaskara and aerobic training and Group IV controls. For the collection of data pre and post-tests were conducted on Body mass index and body fat by using stadiometer & weighting machine and values were incorporated by applying BMI principle Weight in Kg/ Height in Metr² and skinfold calliper respectively. The data was collected prior and after twelve weeks of training. The data was analysed by applying ANCOVA. The level of confidence fixed at 0.05 level. The results of the study showed that suryanamaskara and aerobic training has significantly influenced body composition variables as compared to the control group.

Keywords: Suryanamaskara and aerobic training, united, body mass index, and body fat

Introduction

Sports training is a process of preparing for performance at any level of competition in a sport or game. Competing in any sport needs training systematically and scientifically. The entire process involves tremendous physical and mental effort both for the athlete and the trainers. It is systematic as it requires adherence to a few well-established and time-tested principles and exotic techniques, and it is scientific because, without support from sports sciences, it is now humanly impossible to excel and be a champion. Prof. M.L Kamalesh (2022) [4].

Suryanamaskara is a series of asanas executed continuously. The series has a complete (entire body) effect. All the plexuses of the body, the circulatory, pulmonary, nervous systems, digestive organs, and big muscle groups are affected. It affects each sequence of the spine and all joints. It is most useful in stretching and warming up the muscles and joints and for loading the cardiovascular system. Controlled breathing is applied. The effect of this routine called the Sun Salutation, or Surya Namaskar. Aladar Kogler (1999) [1].

Aerobic endurance training is generally associated with alterations in body composition, assuming appropriate nutritional intake. Aerobic endurance training usually decreases the relative percentage of body fat but has little or no significant effect on fat-free mass. Longer-term programs can result in greater decreases in the percentage of body fat. Brooks. GA *et al.* (2004) [2].

Both Suryanamaskara and Aerobic training influence the body composition, increasing the muscle mass and decreasing body fat percentage, these two influence the athlete's performances. The optimal body composition helps to develop levels of muscle force and power finally leads to develop more efficient movement. Body composition makes an important contribution to an individual's level of physical fitness performance, particularly in activities that require one to be carried, one's body weight over a distance, which will be facilitated by a large proportion of active tissue in relation to a small proportion of inactive tissue.

In the present study, the scholar is very much sensitized to analyze solitary and united effects of two streams of activities like suryanamaskara and aerobic activities.

Methodology

For the collection of required data through the scientific method, the investigator has selected sixty (N=60) degree college women students in the age group of 18-21 years were randomly divided into four groups of fifteen (n=15) each. Group I, Group II, and Group III had 12 weeks of training on suryanamaskara, aerobics, and united suryanamaskara & aerobic training respectively and Group IV acted as control. All four groups have attended their regular college schedule. Body composition was measured by stadiometer & weighting machine and values were incorporated by applying BMI principle Weight in Kg/ Height in Metr², and body fat it can be measured by skinfold caliper.

Statistical Analysis

The data were collected from the four groups prior to and after the experiment period. Body mass index and body fat

were statistically examined by employing analysis of covariance (ANCOVA). To find out the significance difference, the level of confidence was fixed at 0.05 level.

Training Programme

During the training period, the three experimental groups namely suryanamaskara and aerobic training groups underwent their respective training program, three sessions per week, each last for about 60 minutes including warm-up and warm-down for twelve weeks. United suryanamaskara and aerobic training underwent went the respective training program three sessions per week each last about 90 minutes including warm-up and warm-down for twelve weeks. Whereas control group did not participate in any training program. All groups are attended their regular college schedule.

Results and Discussion

The influence of independent parameters on each dependent parameters were analyzed and illustrated below.

Table 1: ANCOVA for the pre, post, and adjusted post-test data on body mass index of suryanamaskara, aerobic and united suryanamaskara & aerobic training group and control groups

Tests		Surya Namaskar Training group	Aerobic Training group	United Suryanamaskara & Aerobic Training group	Control group	Source of Variance	DF	Sum of Squares	Mean Squares	F Value
Pre-test	\bar{x}	24.66	24.66	24.82	24.91	B	3	0.69	0.23	0.40
	σ	0.68	0.68	0.90	0.74	W	56	31.81	0.57	
Post-test	\bar{x}	23.05	20.41	19.25	24.93	B	3	296.49	98.83	202.94*
	σ	0.96	0.54	0.48	0.70	W	56	27.27	0.49	
Adjusted Post-test	\bar{x}	23.10	20.46	19.22	24.86	B	3	291.43	97.14	266.19*
						W	55	20.07	0.37	

*Implication at 0.05 level of assurance.

The table value for implication at 0.05 level with degrees of freedom 3 and 56 and 3 and 55 are 2.776 and 2.78 consequently

The table I exhibits that the pre-test means of suryanamaskara, aerobic and united suryanamaskara & aerobic training group and control groups are 24.66, 24.66, 24.82 and 24.91 kg/m² consequently. The achieved 'F' ratio of 0.40 for pre-test means is less than that of the table value of 2.776 for the degrees of freedom 3 and 56 required for implication at 0.05 level. The post-test means of suryanamaskara, aerobic and united suryanamaskara & aerobic training group and control groups are 23.05, 20.41, 19.25 and 24.93 kg/m² consequently. The achieved 'F' ratio of 202.94 for post-test means is greater than that of the table

value for 2.776 for the degrees of freedom 3 and 56 required for implication at 0.05 level. The Adjusted post-test means of suryanamaskara, aerobic and united suryanamaskara & aerobic training group and control groups are 23.10, 20.46, 19.22 and 24.86 kg/m² consequently. The achieved 'F' ratio of 266.19 is much greater than that of the table value for 2.78 for the degrees of freedom 3 and 55 required for implication at 0.05 level. The results of the study specify that there is a implication difference among adjusted post-test means of suryanamaskara, aerobic and united suryanamaskara & aerobic training group and control groups on Body Mass Index. Scheffe's test was applied as a post-hoc test to determine the implication difference between the four paired means. The findings are illustrated in Table 2.

Table 2: Scheffe's post-hoc test for the difference between the adjusted post-tests paired means of body mass index

Adjusted Post-Test Means				Mean Differences	CI
Surya Namaskar Training group	Aerobic Training group	United Surya Namaskar & Aerobic Training group	Control group		
23.10	20.46	-	-	2.64*	0.91
23.10	-	19.22	-	3.88*	
23.10	-	-	24.86	1.76*	
-	20.46	19.22	-	1.24*	
-	20.46	-	24.86	4.40*	
-	-	19.22	24.86	5.64*	

Implication at 0.05 level of assurance

Table I-A exhibits that the adjusted post-test mean difference on Body Mass Index between suryanamaskara and aerobic training group is 2.64, suryanamaskara and united suryanamaskara & aerobic training group is 3.88, suryanamaskara training group and control group is 1.76,

aerobic and united suryanamaskara & aerobic training group is 1.24, aerobic training group and control group is 4.40, united suryanamaskara & aerobic training group and control group 5.64 are greater than that of CI value 0.91. From the results it is deduced that all the experimental groups have significantly decreased the Body Mass Index as compared to

control group. Based on mean difference it is also concluded that the implication difference also exists among the training groups. Among the training groups united suryanamaskara & aerobic training has significantly lowered the criterion

variable Body Mass Index than that of two training groups. The adjusted post-test mean values on Body Mass Index of four groups are graphically illustrated in Figure 1.

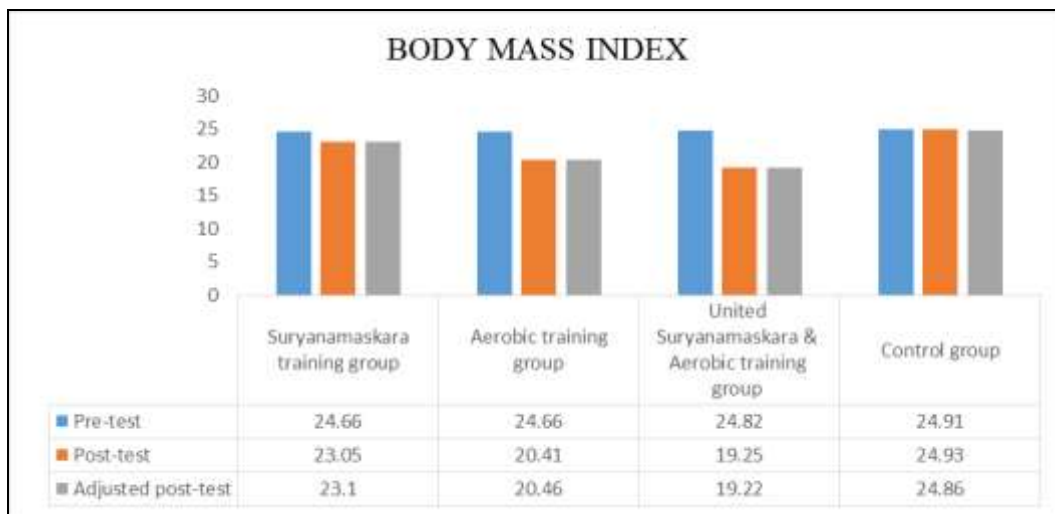


Fig 1: Bar diagram on body mass index of pre, post and adjusted post-test means of solitary and united suryanamaskara & aerobic training group and control groups

Table 3: ANCOVA for the pre, post and adjusted post test data on body fat of suryanamaskara, aerobic training and united suryanamaskara and aerobic training group and control groups

Tests		Suryanamaskara Training group	Aerobic Training group	United Suryanamaskara & Aerobic Training group	Control Group	Source of Variance	DF	Sum of Squares	Mean Squares	F Value
Pre-test	\bar{x}	19.33	19.33	19.26	19.26	B	3	0.08	0.03	0.16
	σ	0.43	0.43	0.42	0.38	W	56	9.69	0.17	
Post-test	\bar{x}	14.67	15.74	14.06	19.27	B	3	244.97	81.66	678.27*
	σ	0.33	0.31	0.37	0.37	W	56	6.74	0.12	
Adjusted Post-test	\bar{x}	14.65	15.72	14.07	19.29	B	3	246.81	82.27	1467.69*
	σ					W	55	3.08	0.056	

*Implication at 0.05 level of assurance

The table value for implication at 0.05 level with degrees of freedom 3 and 56 and 3 and 55 are 2.776 and 2.78 consequently

The table II exhibits that the pre-test means of suryanamaskara, aerobic and united suryanamaskara & aerobic training group and control groups are 19.33, 19.33, 19.26 and 19.26 Mm consequently. The achieved 'F' ratio of 0.16 for pre-test means is less than that of the table value of 2.776 for the degrees of freedom 3 and 56 required for implication at 0.05 level. The post-test means of suryanamaskara, aerobic and united suryanamaskara & aerobic training group and control groups are 14.67, 15.74, 14.06 and 19.27 Mm consequently. The achieved 'F' ratio of 678.27 for post-test means is greater than that of the table

value for 2.776 for the degrees of freedom 3 and 56 required for implication at 0.05 level. The Adjusted post-test means of suryanamaskara, aerobic and united suryanamaskara & aerobic training group and control groups are 14.65, 15.72, 14.07 and 19.29 Mm consequently. The obtained 'F' ratio of 1467.69 is greater than that of the table value for 2.78 for the degrees of freedom 3 and 55 required for implication at 0.05 level. The results of the study indicates that there is a implication difference among adjusted post-test means of suryanamaskara, aerobic and united suryanamaskara & aerobic training group and control groups on Body Fat. Scheffe's test was applied as a post-hoc test to determine the significance difference between the four paired means. The findings are illustrated in Table II-A.

Table 4: Scheffe's post-hoc test for the difference between the adjusted post-tests paired means of body fat

Adjusted Post-Test Means				Mean Differences	CI
Suryanamaskara Training group	Aerobic Training group	United Suryanamaskara & Aerobic Training group	Control group		
14.65	15.72	-	-	1.07*	0.36
14.65	-	14.07	-	0.58*	
14.65	-	-	19.29	4.65*	
-	15.72	14.07	-	1.65*	
-	15.72	-	19.29	3.57*	
-	-	14.07	19.29	5.23*	

*Implication at 0.05 level of assurance.

Table 4. exhibits that the adjusted post-test mean difference on Body Fat between suryanamaskara and aerobic training group is 1.07, suryanamaskara and united suryanamaskara and aerobic training group is 0.58, suryanamaskara training group and control group is 4.65, aerobic and united suryanamaskara and aerobic training is 1.65, aerobic training group and control group is 3.57, and united suryanamaskara and aerobic training group and control group is 5.23 are much greater than that of CI value 0.36. From the results it is

inferred that all the experimental groups have significantly decreased the Body Fat as compared with the control group. Based on mean difference it is also concluded that the implication difference also exists among the training groups. Among the training groups united suryanamaskara & aerobic training has significantly reduced the criterion variable body fat than that of two training groups. The adjusted post-test mean values on Body Fat of four groups are graphically illustrated in Figure 2.

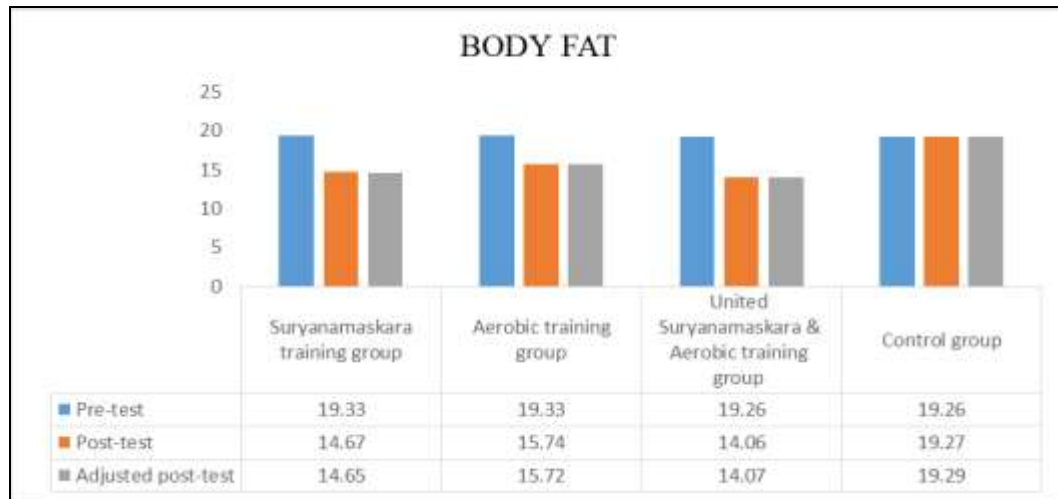


Fig 2: Bar diagram on body fat of pre, post and adjusted post-test means of suryanamaskara, aerobic and united suryanamaskara & aerobic training group and control groups

Discussion on findings

Research results indicates that suryanamaskara, aerobic and united suryanamaskara & aerobic training has decrease the body mass index and body fat as compared to the control group. The united suryanamaskara & aerobic training regimen is more effective than the suryanamaskara and aerobic training protocol in successfully decrease the BMI and Body fat variables.

Body mass index

From the result it has been concluded that suryanamaskara, aerobic and united suryanamaskara & aerobic training has decrease the body mass index as compared to the control group. According to Mr Mathewos Hosiso *et al.* (2013) [3], consecutively 12 weeks of training i.e., 3 days/week, 60 min / day aerobic exercise leads to reduce the body mass index Tadele Ademe *et al.* (2013) [6], have proved that 3 days/week/ 12 weeks can decrease the body composition. The results of the present study fell in line with the above research evidence.

Body fat

From the result it has been concluded that suryanamaskara, aerobic and united suryanamaskara & aerobic training has successfully decrease the body fat as compared to the control group. Shahana A *et al.* (2010) [5], has proved that thrice / week/ 12 weeks of aerobic exercise training can decreased skin fold thickness (body fat %).

Conclusion

The present study has successfully influenced the selected variables of body mass index and body fat by employing the 12 weeks suryanamaskara, aerobic and united suryanamaskara & aerobic training protocol.

Implications

Based on the above results of the study 12 weeks of

suryanamaskara, aerobic and united suryanamaskara & aerobic training is strongly advisable to bring the desirable modifications on the body mass index and body fat among college sports women and it will be an effective training protocol to the clients who are with deep desire for an effective wellness and fitness.

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