

## **EFFECTS OF YOGA ASANA AND YOGA ASANA WITH PRANAYAMA ON SELECTED PHYSICAL PHYSIOLOGICAL AND PSYCHOLOGICAL VARIABLES AMONG WORKING WOMEN IN TEXTILE INDUSTRY**

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### **ABSTRACT**

The impartial of this study was to explore the yoga asana and yoga asana with pranayama on selected physical, physiological and psychological variables of working women in textile industry, totally 30 women employees to participate in this study. Treatment group I underwent yoga asana, Treatment group II underwent yoga asana with pranayama and group III acted as control group. All thirty subjects were inducted for pre and posttest on balance, vital capacity and mood disturbance. The yoga asana and yoga asana with pranayama was given to the experimental group for 5 days per week (Monday to Friday) for the period of eight weeks. The control group was not given any sort of training except their routine work. The Balance (**Stroke stand balance test in seconds/minutes**), Vital capacity (**Wet spirometer, in liters**) and Mood disturbance (**unipolar scale, questionnaires**) were assessed before and after training period. The result from ANOVA F-ratio and inferred that 8-week yoga asana treatment produced identical changes over balance, vital capacity and mood disturbance of working women in textile industry. Further, the findings confirmed the yoga asana training and yoga asana and pranayama is suitable protocol to bring out the desirable changes over balance, vital capacity and mood disturbance of working women textile industry.

**Keywords:** Yoga asana, Pranayama, Balance, Vital Capacity, Mood Disturbance and Working women in Textile Industry.

### **1.1 Yoga Asana in Yoga Sutras of Patanjali**

Let us start first with the definition of asana, "Sthira-Sukhamaasanam", "asana must be steady and comfortable" (sutra 2.46). It is worth noting here that in the context of Patanjali's Yoga Sutras, asana usually meant a sitting posture used for meditation. While sitting in meditation it is important that one maintain a very steady pose, without any shaking or trembling, and also comfortable. Since we need to sit for a long duration while in meditation, it is important that the posture should not cause any

discomfort. In the context of the modern-day yoga practice, the above definition is now extended to all the yoga postures that are practiced. For example, in a seated full forward stretch, the body must feel relaxed and should remain steady for the duration of the pose. So, how to achieve a 'steady and comfortable' asana Patanjali gives us his approach in the next sutra "prayatna-shaithilya anantyasamaapattibhyaam" – "asana is made steady and comfortable through relaxing the effort and total absorption in the endless" (sutra 2.47). This sutra has two parts "prayatna shaithilyam" and "ananta samapatti". Let us look at these separately. The third limb of yoga is asana or posture, asana brings steadiness, health and lightness of limb. A Steady and pleasant posture produces mental equilibrium and prevents fickleness of mind. Asanas are not merely gymnastic exercises. They are postures; asanas have been evolved over the centuries so as to exercise every muscle, nerve and gland in the body. They reduce fatigue and soothe the nerves, but their real importance lies in the way they train and discipline the mind (Iyengar, 2002).

## **1.2 Pranayama**

Prana is the vital energy required for sustaining the dynamic operation and coordination of each organ within a body. The continuous flow of Prana in the Nadis, or subtle nerves in the body, is important for a disease-free body. Pranayama is control and smooth flow of Prana through Yoga exercises. Pranayama or Prana control can be achieved by the modification of breathing patterns. Pranayama exercise is done through proper regulation of inhaling, holding the breath and exhaling. While pranayama can be practiced alone, it can be integrated with several of the asanas (postures) for improved benefits. Caution: Pranayama, exercises of breathing, should be properly learnt and practiced from expert teachers through formal learning. According to Patanjali Yoga Sutras, "Regulation of breath or the control of prana is the stoppage of inhalation and exhalation, which follows after securing that steadiness of posture or seat, asana. According to Sri Sankaracharya," Pranayama is the control of all life-forces by realizing naught but Brahman in all things as the mind, etc." The Gita says," Others offer Prana (outgoing breath) in Apana (incoming breath) and Apana in Prana, restraining the passage of Prana and Apana, absorbed in Pranayama. Pranayama is a precious Yana (sacrifice)." The control of breath is called pranayama in Sanskrit. The word pranayama is a compound word which consists of prana and ayama. Prana means life force, or the vital energy, or that forced by which have our life. Ayama means control, i.e., control of breath. That is the literal meaning (Swami Abhedananda, 1999).

The textile industry is one of the fast-growing and most important industries for the economic growth of India as well as worldwide. It is a labour-intensive industry provides jobs to millions of people both skilled and unskilled also covers both urban and rural areas. Especially it accounts for more than 80% of women workers. Though it provides women empowerment, also poses many physical and psychological hurdles to them due to the nature of working conditions of the textile industries. Many researches attempted to expose the health issues associated with those industries and very few attempted to find out alternative solutions which enhance the health of the workers also their working capacity. In this paper, an attempt is made to find out the effects of yoga asana and pranayama especially asana and Surya Namaskara on physical fitness, physiological and psychological variables among women workers in textile Industry.

### **3.1 MATERIALS AND METHODS**

To achieve the purpose of the study 60 working women in textile industry at the age group of 25-35 years were selected from TamilNadu. The selected subject was randomly assigned into three equal groups, consist of fifteen each, namely yoga asana training group (n=15), Yoga asana with pranayama training group (n=15) and Control group (n=15). The respective training was given to the experimental group the 6 days per weeks (Monday to Saturday) for the training period of eight weeks. The control group was not given any sort of training except their routine. The evaluated Balance (**Stroke stand balance test in seconds/minutes**), Vital capacity (**Wet spirometer,In liters**) and Mood disturbance (**unipolar scale,questionnaires**).The parameters were measured at baseline and after 8 weeks of yoga training were examined. The intensity was increased once in two weeks based on the variation of the exercises. The training programme was lasted for 45 minutes for session in a day, 6 days in a week for a period of 8 weeks duration. These 45 minutes included warm up for 10 minutes, 25 minutes yoga, suryanamaskar and warm down for 10 minutes. The equivalent in yoga asana and pranayama is the length of the time each action in total 6 day alternatively per weeks. (Monday to Saturday).

### **3.2 STATISTICAL ANALYSIS**

To test the objectives of the present study, the collected data will be treated with the following statistical treatment. Repeated measures ANOVA, F-ratio were applied. When the F ratio is found to be significant was applied to test which of the possible comparison among the means are significant. Analysis of Covariance was applied to determine the significant difference among the three groups namely Yoga asana training group, Yoga asana with Pranayama training group and the control group. The

development of selected variables after 16 weeks of training. If the mean difference was significant, the pairs of adjusted final group means was tested for significance by applying Scheffes post-hoc test.

**TABLE –I**  
**MEANS FOR EACH DEPENDENT VARIABLES BY THE EXPERIMENTAL GROUPS**  
**AND CONTROL GROUP**

<b>Variables</b>		<b>Yoga Asana Training Group</b>	<b>Yoga asana with Pranayama Training Group</b>	<b>Control Group</b>
<b>Balance</b>	Pre-test mean	17.65	17.70	16.05
	Mid test mean	18.60	18.25	16.20
	Post test mean	18.80	19.15	16.30
<b>Vital Capacity</b>	Pre-test mean	2325.00	2322.50	2330.00
	Mid test mean	2347.50	2362.50	2332.50
	Post test mean	2372.50	2402.50	2335.00
<b>Mood Disturbance</b>	Pre-test mean	40.35	41.95	37.70
	Mid test mean	39.40	40.45	37.60
	Post test mean	38.55	38.90	37.50

Table –I shows that the pre-test and post-test means on selected variables of yoga asana training, yoga asana with pranayama training and control group.

#### **4.1 TREATMENTS EFFECTS OF YOGA ASANA TRAINING GROUP DURING DIFFERENT PHASES**

To examine the obtained differences between the means of selected variables in the pre-test and post-test are statistically significant, one-way repeated measures ANOVA was applied and the statistical analysis has been summarized.

Table II presents the results of one-way repeated measures analysis of variance on selected variables of yoga asana training group at two tests (pre-test and post-test) with different time period.

**TABLE - II**

**ONE WAY REPEATED MEASURES ANOVA ON SELECTED VARIABLES OF PRE-TESTS  
AND POST TESTS OF YOGA ASANA TRAINING GROUP**

<b>Group</b>	<b>Sources of variance</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Squares</b>	<b>Obtained 'F' ratio</b>
<b>Balance</b>	Between	23.033	2	11.517	19.055*
	error	22.967	38	0.604	
<b>Vital Capacity</b>	Between	22583.33	2	11291.66	11.468*
	error	37416.66	38	984.649	
<b>Mood disturbance</b>	Between	32.433	2	16.217	24.748*
	error	24.900	38	0.655	

Significant at 0.05 level. The table value required for significance at 0.05 level with df 2 and 38 is 3.24.

Table II shows that the obtained F- ratio values of yoga asana training group on all the selected variables were greater than the table value of 3.24 with df 2 and 38 required for significance at 0.05 level of confidence. The results of the study indicate that there was significant difference among the means of three tests at different time period for yoga asana training group on selected variables balance, vital capacity and mood disturbance. To find out which of the three paired means had a significant difference, the Scheffe's post-hoc test was applied and the results are presented in the table.

**TABLE-III**

**SCHEFFE'S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POSTTEST  
PAIRED MEANS OF BALANCE**

<b>Adjusted Post Test Mean</b>			<b>Mean differences</b>	<b>Confidence Interval value</b>
<b>Yoga Asana Training Group (YSTG)</b>	<b>Yoga Asana with Pranayama Training Group (YWPTG)</b>	<b>Control Group (CG)</b>		

18.673	18.277		0.396	0.752
18.673		17.300	1.373*	
	18.277	17.300	0.977*	

\*Significant.

**TABLE - IV**

**SCHEFFE’S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POSTTEST  
 PAIRED MEANS OF VITAL CAPACITY**

Adjusted Post Test Mean				
Yoga Asana Training Group (YSTG)	Yoga Asana with Pranayama Training Group (YWPTG)	Control Group (CG)	Mean differences	Confidence Interval value
2373.173	2405.194		32.021*	30.163
2373.173		2331.630	41.543*	
	2405.194	2331.630	73.564*	

\*Significant.

**TABLE- V**

**SCHEFFE’S TEST FOR THE DIFFERENCES BETWEEN THE ADJUSTED POSTTEST  
 PAIRED MEANS OF MOOD DISTURBANCE**

Adjusted Post Test Mean		

<b>Yoga Asana Training Group (YSTG)</b>	<b>Yoga Asana with Pranayama Training Group (YWPTG)</b>	<b>Control Group (CG)</b>	<b>Mean differences</b>	<b>Confidence Interval value</b>
31.852	33.664		1.812	4.20
31.852		39.584	7.732*	
	33.664	39.584	5.920*	

\*Significant.

Table III-V shows that the adjusted post-test means differences on selected variables between the yoga asana training group and yoga asana with pranayama training group; yoga asana training group and control group; yoga asana with pranayama training group and control group.

It is inferred that there is significant mean difference between the adjusted post mean of yoga asana training group and control group in balance, vital capacity and mood disturbance.

It is inferred that there is significant mean difference between the adjusted posttest means of yoga asana with pranayama training group and control group in balance, vital capacity and mood disturbance.

It is inferred that there is significant mean difference between the adjusted posttest means of yoga asana training group and yoga asana with pranayama training group in balance, vital capacity and mood disturbance.

The adjusted posttest mean values of yoga asana training and yoga asana with pranayama training and control group on selected variables are graphically represented in figure I-III.

**FIGURE - I**

**BAR DIAGRAM SHOWING THE ADJUSTED POSTTEST MEANS DIFFERENCES OF YOGA ASANA TRAINING, YOGA ASANA WITH PRANAYAMA TRAINING AND CONTROL GROUP ON BALANCE**



**FIGURE - II**

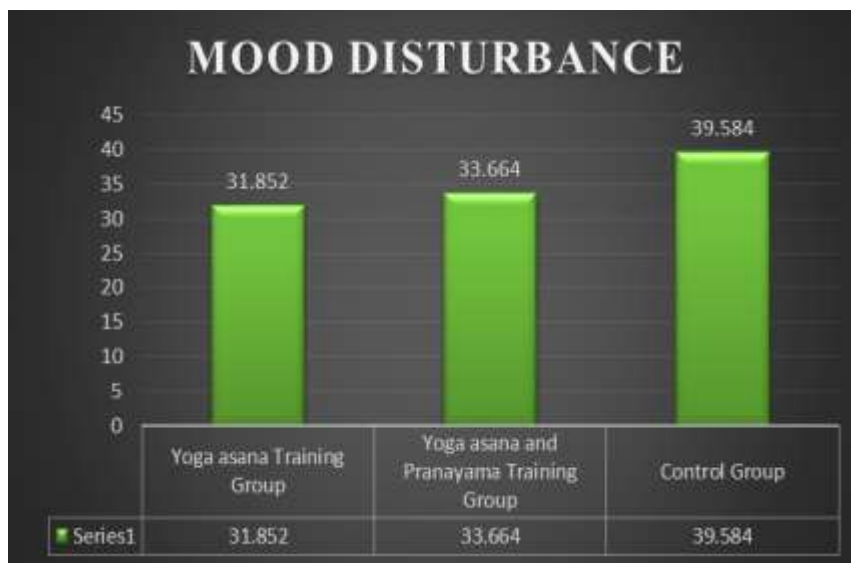
**BAR DIAGRAM SHOWING THE ADJUSTED POSTTEST MEANS DIFFERENCES OF YOGA ASANA TRAINING, YOGA ASANA WITH PRANAYAMA TRAINING AND CONTROL GROUP ON VITAL CAPACITY**



**FIGURE - III**



**BAR DIAGRAM SHOWING THE ADJUSTED POSTTEST MEANS DIFFERENCES OF YOGA ASANA TRAINING, YOGA ASANA WITH PRANAYAMA TRAINING AND CONTROL GROUP ON MOOD DISTURBANCE**



#### 4.2 DISCUSSION ON FINDINGS

The results of the findings were discussed under the following pertinent areas of effects of two methods of training namely Yoga Asana training and Yoga Asana with Pranayama training on Physical fitness Physiological and Psychological variables among among women workers in textile industry.

The results of the present study indicates that all the two training programs Yoga asana training and Yoga asana with pranayama training had influenced changes in the selected variables of balance, vital capacity and mood disturbance due to sixteen weeks of systematic training.

#### 4.3 CONCLUSION

1. Yoga asana Training group had significant improvement in balance and mood disturbance and significant reduction in vital capacity.
2. Yoga asana with Pranayama Training group had significant improvement in vital capacity and significant reduction in balance and mood disturbance.

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