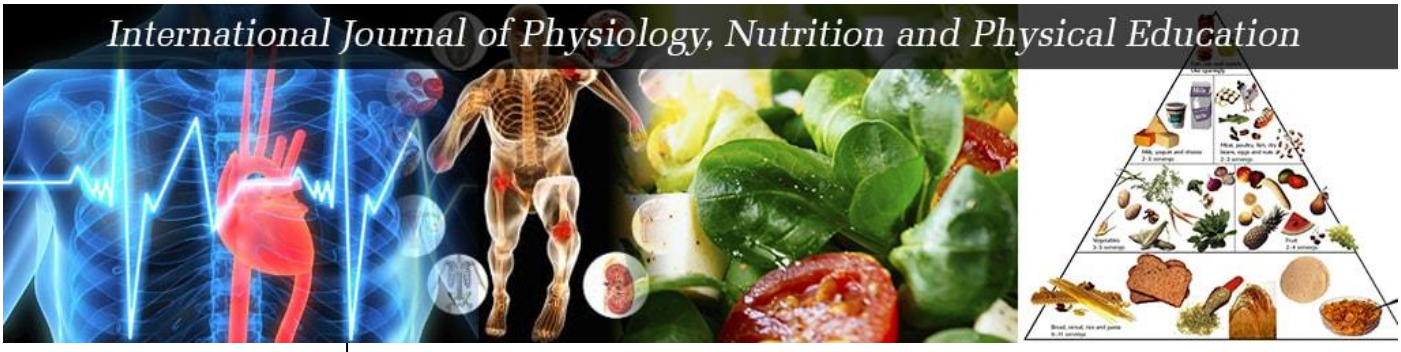

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Effect of hatha yoga practices on selected physicaland physiological parameters among the working women

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Abstract
The purpose of the study was to find out the effect of hatha yoga practices on selected physical and physiological parameters among the working women. To achieve the purpose of the study, fifty working women were selected randomly from Bharathiar University, Coimbatore. The subjects aged from 30 to 45 years. The selected subjects were divided into two equal groups, namely hatha yoga training group (Group A), and control group (Group B) each group consist of 25 subjects. The training period was limited to twelve weeks and for three days per week. The hatha yoga practices was selected as independent variables and flexibility of hip joint, flexibility of shoulder joint, breath holding capacity, pulse rate, were selected as dependent variable and it was measured by hip flexibility test, shoulder flexibility test, Nose clip, and Cardio Radial Pulse. All the subjects were tested two days before and immediately after the experimental period on the selected dependent variables. The obtained data from the experimental group (Group A) and control group (Group B) before and after the experimental period were statistically analyzed with 't' ratio to find out significant improvement for each variable separately in order to determine the differences, if any, among the adjusted post-test means. The level of significance was fixed at 0.05 level confidences for all the cases. The results of study shows that there was the significant effect on flexibility of hip joint, flexibility of shoulder joint, breath holding capacity, pulse rate of experimental group due to the effect of followed by hath yoga practices training when compared to the control group.

Keywords: flexibility of hip joint, flexibility of shoulder joint, breath holding capacity, and pulse rate

Introduction
Hatha yoga the word hatha is derived from two roots – 'Ha' means 'sun' and 'Tha' means moon. The two energies 'Ha' and 'Tha' are prana and apana.it is works with the prana and apana. Hatha yoga is the branch of yoga which concentrates on physical health and mental well –being. Hatha yoga uses bodily postures (asanas), breathing techniques (pranayama), and meditation (dyana) with the goal of bringing about a sound, healthy body and a clear, peaceful mind. There are nearly 200 hatha yoga postures, with hundreds of variations, which work to make the spine supple and to promote circulation in all the organs, glands, and tissues. Hatha yoga postures also stretch and align the body, promoting balance and flexibility.

Hatha yoga is probably the most commonly known of the different branches of yoga. Hatha yoga is much more than asana. It is a complete and integral system of spiritual development for body, mind and soul. It is not only a sophisticated physical system but contains in – depth knowledge about the subtle body, its nadis and chakras, as well. It goes into great detail not only regarding asana, but also pranayama, mantra and meditation.

The yoga of asana practice in traditional hatha yoga differs from that of most modern groups. Hatha yoga does not aim merely at making us feel better on a physical level; it contains intense ascetic practices for physical and psychic purification. It is a path to full enlightenment or self – realization, not a preliminary or bodily based system only. Classical Hatha Yoga therefore contains but goes far beyond the usual idea of modern yoga approaches and their exercise/ therapy orientation.

Methodology

For the purpose of this study, altogether fifty working women were chosen on random basis from Bharathiar University, Coimbatore. Their age group ranges from 30 to 45 years. They were divided into two equal groups of 25.The Experimental group I would undergo hatha yoga practices training. The second group Control group II.Pre – test and post –test would be conducted. Treatment would be given for twelve weeks. It would be find out finally the effect of hatha yoga practices training on the working women's in scientific methods.

Criterion Measurements

Table 1: The selected tests were measured by following units for testing:

Criterion Variables	Test Items	Unit Measurements
Flexibility of hip joint	Hip flexibility test	Centimeters
Flexibility of shoulder joint	Shoulder flexibility test	Centimeters
Breath holding capacity	Nose clip	Counting in seconds
Pulse rate	Cardio Radial Pulse	Number of beats per minutes

Statistical Technique

Day	Training programme	Time
Monday	Hatha Yoga Practice	7.00 AM – 8.30AM
Tuesday	Rest	7.00 AM – 8.30AM
Wednesday	Hatha Yoga Practice	7.00 AM – 8.30AM
Thursday	Rest	7.00 AM – 8.30AM
Friday	Hatha Yoga Practice	7.00 AM – 8.30AM
Saturday & Sunday	Rest	

The achieved data since the experimental group and control group previously and subsequently the experimental dated were statistically evaluated with dependent t-test to discovery obtainable significant development. The level of significance was secure at 0.05 level of confidence for all the cases.

Training Programme

The procedure adopted in the training programme for the present study is described in the following aspects.

During the training period, the experimental groups practiced hatha yoga practices for 12 weeks. The groups practiced for duration of 90 minutes. They started with a warming – up for a period of 10 minutes. During the warming – up the participants was trained to perform suryanamaskar in a slow manner so that each of the 12 poses was held for duration of 5 seconds. They performed suryanamaskar five times. At the end of the class the participants performed relaxation asanas such as savasana and matsyasana for a period of 5 minutes.

Table 2: Description on Design of the Training Programme

Groups	Design of the training
Experimental Group I	Hatha yoga training
Control Group II	Did not do any Specific Training
Training Duration	90 Minutes
Training Session	3 Days a week
Total Length of Training	Twelve weeks

Experimental Design Group

The experimental group was given hatha yoga training after taking an initial test. After the initial test selected hatha yoga training exercises were given for twelve weeks in 3 days a week. The time of practice was from 7.00A.M to 8.30A.M.The control group was not participating in any of the special training programme. However they were allowed to participate in their regular works.

Training Schedules

Table 3: Hatha Yoga Practice Training Program

Week	Asanas	Rep	Set	Holding time (in seconds)	Each asana (in seconds)	Rest in between asana (in seconds)
1-4 weeks	Meditation 5 minutes					
	Stretching 10 minutes					
	Suryanamaskar	5	1	5		30
	Asanas			60minutes		
	Talasana	4	2	7	15	30
	Padahastasana	4	2	7	15	30
	Priayasana	4	2	7	15	30
	Ardhakatichakrasana	4	2	7	15	30
	Virabadrasana	4	2	7	15	30
	Ardhamatseyentrasana	4	2	7	15	30
	Paschimottasana	4	2	7	15	30
	Navukasana	4	2	7	15	30
	Sarvangasana	4	2	7	15	30
	Halasana	4	2	7	15	30
	Bhujangasana	4	2	7	15	30
	Salabasana	4	2	7	15	30
	Relaxation 5 minutes					
	Pranayama 10 minutes					
	Nadi-suddhi pranayama	6-8	2	-	-	30
	Nadi-sodhana pranayama	6-8	2	4	-	30
	Sittali pranayama	6-8	2	-	-	30
	Sittkari pranayama	6-8	2	-	-	30

Week	Asanas	Rep	Set	Holding time (in seconds)	Each asana (in seconds)	Rest in between asana (in seconds)
	Meditation 5 minutes					
	Stretching 10 minutes					
	suryanamaskar	5	1	5		30
	Asanas			60minutes		

5-8 weeks	Talasana	3	2	10	20	30
	Padahastasana	3	2	10	20	30
	Priayasana	3	2	10	20	30
	Ardhakatichakrasana	3	2	10	20	30
	Virabadrasana	3	2	10	20	30
	Ardhamatseyentrasana	3	2	10	20	30
	Paschimottasana	3	2	10	20	30
	Navukasana	3	2	10	20	30
	Sarvangasana	3	2	10	20	30
	Halasana	3	2	10	20	30
	Bhujangasana	3	2	10	20	30
	Salabasana	3	2	10	20	30
	Relaxation 5 minutes					
	Pranayama 10 minutes					
	Nadi-suddhi pranayama	8-10	2	-	15	30
	Nadi-sodhana pranayama	8-10	2	4	15	30
	Sittali pranayama	8-10	2	-	15	30
	Sittkari pranayama	8-10	2	-	15	30

Week	Asanas	Rep	Set	Holding time (in seconds)	Each asana (in seconds)	Rest in between asana (in seconds)
9-12 weeks	Meditation 5 minutes					
	Stretching 10 minutes					
	suryanamaskar	5	1	5		30
	Asanas			60minutes		
	Talasana	2	2	13	25	30
	Padahastasana	2	2	13	25	30
	Priayasana	2	2	13	25	30
	Ardhakatichakrasana	2	2	13	25	30
	Virabadrasana	2	2	13	25	30
	Ardhamatseyentrasana	2	2	13	25	30
	Paschimottasana	2	2	13	25	30
	Navukasana	2	2	13	25	30
	Sarvangasana	2	2	13	25	30
	Halasana	2	2	13	25	30
	Bhujangasana	2	2	13	25	30
	Salabasana	2	2	13	25	30
	Relaxation 5 minutes					
	Pranayama 10 minutes					
	Nadi-suddhi pranayama	10-12	2	-	20	30
	Nadi-sodhana pranayama	10-12	2	4	20	30
	Sittali pranayama	10-12	2	-	20	30
	Sittkari pranayama	10-12	2	-	20	30

Results and Discussions

The effect of independent variables on each criterion variables was considered by dependent 't' – test on the data achieved for flexibility of hip joint, flexibility of shoulder joint, breath holding capacity, pulse rate. The pretest and post-test means of experimental group and control group have been analyzed and existing in Table I.

Table 4: Mean and dependent 't' – test for the pre and post tests on flexibility of hip joint, flexibility of shoulder joint, breath holding capacity, pulse rate of experimental and control groups

S. No	Variable	Group/Test	Mean	SD	SEM	DF	't' ratio
1.	Flexibility of hip joint (centimeters)	Experimental Pre - test	51.54	5.03	1.005	24	32.95*
		Experimental Post - test	91.22	4.20	.84		
		Control Pre – test	60.49	16.26	2.87	23	2.90
		Control Post – test	51.81	5.07	.90		
2.	Flexibility of shoulder joint (centimeters)	Experimental Pre - test	41.28	4.18	.84	24	4.70*
		Experimental Post - test	44	5.47	1.09		
		Control Pre – test	42.16	4.97	.88	23	2.32
		Control Post – test	41.22	4.39	.78		
3.	Breath holding capacity (counting in seconds)	Experimental Pre - test	15.01	25.03	5.01	24	3.50*
		Experimental Post - test	34.29	23.67	4.73		
		Control Pre – test	36.18	22.99	4.07	23	.84
		Control Post – test	34.30	24.87	4.40		
4.	Pulse Rate (number of beats per minutes)	Experimental Pre - test	70.72	4.83	.97	24	5.5*

		Experimental Post - test	76.44	6.24	1.25		
		Control Pre - test	76.28	6.48	1.14	23	2.72
		Control Post - test	75.19	6.50	1.15		

*Significance at 0.05 level of confidence

The table I, shows that, the obtained 't'–ratio between the pre and posttest means of experimental group were 32.95,4.70,3.50,5.5 and control group were 2.90,2.32,.84,2.72 respectively. The table values required for significant difference with df 24 at 0.05 level of confidence. Since the obtained 't' – ratio value of experimental and control group on were greater than the table value 2.063,it was concluded that the hatha yoga practices training had significantly improved Flexibility of hip joint, Flexibility of shoulder joint, Breath holding capacity, and Pulse rate of experimental group. The pre and posttest mean value of experimental and control group on flexibility of hip joint, flexibility of shoulder joint, breath holding capacity, and pulse rate were graphically represented in the figure 1.

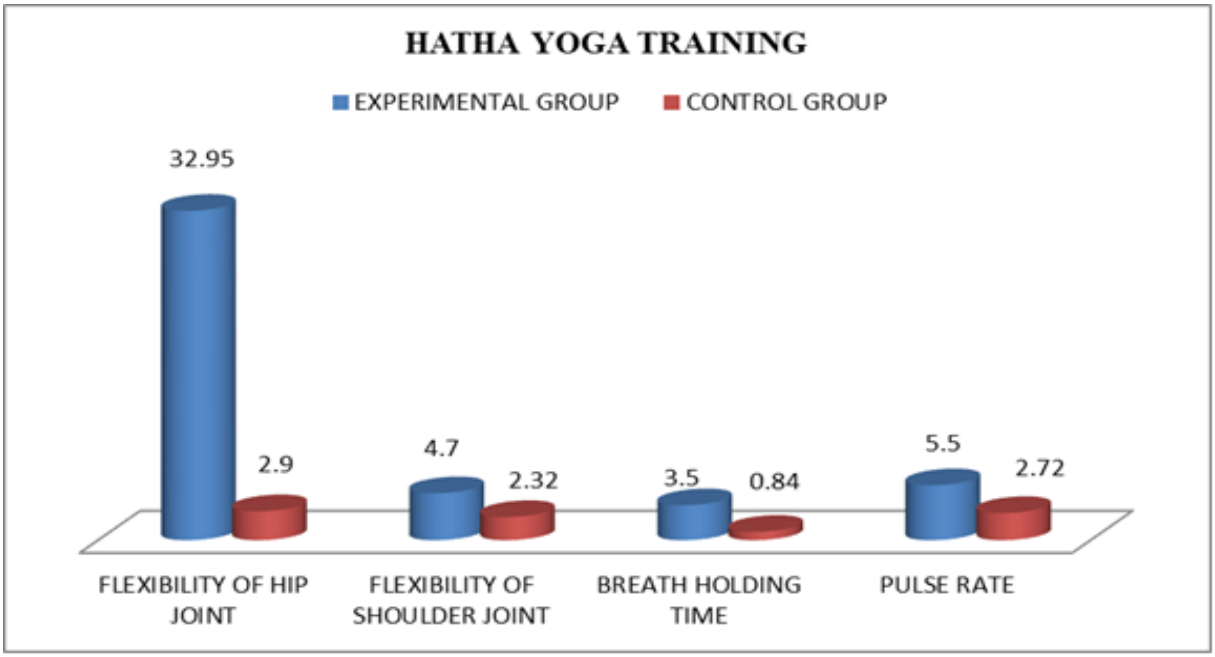

Fig 1: Bar diagram showing the pre and post mean value for hatha Yoga training group and control group of The working women'

Discussion on Findings

The finding of the study reveals that the hatha yoga practices training group cause significant improvement in their physical and physiological parameters. In the view of control group there was no significant improvement in their physical and physiological parameters. The findings of the study corroborate with James A Raub, (2003) [1], Mark. D. Tran MS, Robert G. Holly Ph.D (2007) [2], Neha P. Gothe (2014) [3], Carenlau, Ruby YU and Jean Woo (2015) [4], Malgorzata Grabara, (2016) [5]. in their study, they stated that hatha yoga training developed physical and physiological parameters.

Conclusion

Improvement of on flexibility of hip joint, flexibility of shoulder joint, breath holding capacity, and pulse rate was found significantly on experimental group due to the effect of hatha yoga practices training when compared to the control group.

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