ISBN: 978-81-973427-3-8

4. Influence of Yogic Practice on Body Coordination and Flexibility Among Kalaripayattu Performers

Biju G.

Ph. D, Yoga, Centre for Yoga Studies,
Annamalai University,
Tamil Nadu, India.

Dr. P. Senthil

Research Supervisor / Assistant Professor,
Department of Physical Education, Annamalai University,
Tamil Nadu, India.

Dr. Mahendra Sawant

Co Guide / Associate Professor,
SAI, LNCPE.,
Thiruvananthapuram. Kerala.

Abstract:

The purpose of the study was to find out the influence of yogic practice on body coordination and flexibility among kalaripayattu performers. The study was conducted on 60 kalaripayattu performers in Way to Ananadamaya Yoga-Kalari Research Centre and Charitable Organization, Njarackal, Perinad, Kollam. Totally four group's namely experimental group I (kalaripayattu), group II (yoga), group III (kalaripayattu and yoga) and control group consisting of 15 in each group who underwent twelve weeks whereas the control group did not undergo any type of training. The body coordination and flexibility were measured before and after the experimentation using the standardized test to measure the laboratory investigations and analyzed by Analysis of Covariance (ANCOVA) and it was concluded that the combined group of kalaripayattu and yoga had significant ($P < 0.05$) effect on the body coordination and flexibility.

Keywords:

kalaripayattu, yogaasana, pranayama, body coordination, flexibility.

4.1 Introduction:

Kalaripayattu is an Indian martial art and fighting system that originated in Kerala. It is considered by some to be the oldest martial art still in existence, with its origin dating back to the 3rd century BCE. Kalaripayattu is often called the mother of all martial arts. Kalaripayattu has three schools, which are distinguished by their attacking and defensive patterns. They are Arappa Kayy, Pilla Thangi, and Vatten Thiripp. Early written evidence of martial arts is found in Dhanurveda a part of Atharvaveda and Rig Veda and in Sangam literature about Kalarippayattu in the 3rd century BC to the 2nd century AD.

The Akananuru and Purananuru describe the use of spears, swords, shields, bows and silambam in the Sangam era. The word kalari tatt denoted a martial feat, while kalari kozhai meant a coward in war. Each warrior in the Sangam era received regular military training in target practice, horse and elephant riding. They specialized in one or more of the important weapons of the period including the spear (vel), sword (val), shield (kedaham), and bow and arrow (vil ambu). The combat techniques of the Sangam period were the earliest precursors to kalaripayattu.

Many of the above aspects also apply to yoga practice. Other similarities between yoga and kalari in their traditional form are: ancient Indian origin, similar rules for body postures, some similar positions: warrior position (Virabhadrasana) present in many kalari sequences, animal positions (including paw, lion, cat) present in different versions in both systems, coordination of breathing and movement, old, traditional model of transferring knowledge from master to student, knowledge of anatomy and physiology, knowledge of practices that ensure health, often derived from the ancient Indian holistic medicine, Ayurveda, keeping three components of doshas (body constitutions) in harmony thanks to regular practice, healthy lifestyle, including diet, exercise and sleep, development of holistic personality, the spiritual aspect of practice. Therefore, if we view yoga and kalari as different paths leading to the same goal, spiritual enlightenment we can think that they are similar.

In India, such a path is called sadhana and it can be represented by various other arts or areas of human activity, dance music, fine arts, but also crafts. It all depends on the approach whether we work by vocation, a deeper internal need, or just focus on technical aspects.

4.2 Objectives of the Study:

The objectives of the study are as follows.

- To investigate whether selected yogic practices show any changes on body coordination and flexibility among kalaripayattu performers.
- To analyze the effect of selected yogic practices on body coordination and flexibility among kalaripayattu performers.

Statement of the Problem: The purpose of the present study is to find out the influence of yogic practice on body coordination and flexibility among kalarippayattu performers.

4.3 Inclusion Criteria and Exclusion Criteria:

Inclusion Criteria: Inclusion criteria were kalaripayattu performers ranged between 20 to 35 years at the time of data collection, can read, speak, and understand English language.

Exclusion Criteria: Exclusion criteria were those who didn't practice kalaripayattu and age below 20 or above 35 and not willing to participate in lifestyle modification interventions, sick at the time of data collection, practicing yoga and exercise regularly and undergoing treatment for other complications were excluded.

4.4 Review of Literature:

Sreenath S (2018) studied the effect of Kalaripayattu on physical fitness variables among college students. Kalaripayattu is an Indian form of martial art which is considered to be oldest, which originated in kerala. The primary aim of the research was to ascertain the effect of kalaripayattu on physical fitness variables college students. There are different styles of Kalaripayattu called Vadakkan Northern style, Thekkan Southern style, and Madhya Kerala Central style of Kerala. All use the same weapons but methods and styles were strongly influenced by different regional masters. In this study southern style of kalari was used. The purpose of the study was to find the effect of kalatipayattu on cardiovascular endurance, Balance, Explosive strength and Agility. Twenty college men from MES College, Marampally, Aluva were taken as subjects.

M. Prabu (2016) found the effect of Kalaripayatu Training on Selected Bio Motor Variables of Handball Players. To achieve the purpose of the present study (N=30) college men players were randomly selected from Sri Ramakrishna Mission Vidyalaya maruthi college of physical education and Vivekananda University faculty of general and adapted physical education and yoga, Coimbatore, Tamil Nadu. Their age ranged from 18 to 25 years.

They were assigned to two groups namely experimental group-I with (n=15) boys who were given kalaripayatu training for 12 weeks 5 days a week and other group-II with (n=15) acted as control group.

The experimental group was tested on bio variables namely speed and cardio respiratory endurance. The selected criterion variable was speed measured with 50 m dash and cardio respiratory endurance was measured with 12 min run/walk.

The prior and after test data were collected and treated with Dependent t'test. The level of confidence was fixed at 0.05. The study results showed that the experimental group significantly increased cardio respiratory endurance and speed due to kalaripayatu training programme. The control group did not alter on selected bio motor variables.

Oliver O Donovan et al., (2006) studied the investigation Of Leg and Trunk Strength and Reaction Times of Hard-Style Martial Arts Practitioners. The purpose of this study was to investigate trunk and knee strength in practitioners of hard-style martial arts. An additional objective was to examine reaction times in these participants by measuring simple reaction times (SRT), choice reaction times (CRT) and movement times (MT).

Thirteen highlevel martial artists and twelve sedentary participants were tested under isokinetic and isometric conditions on an isokinetic dynamometer. Response and movement times were also measured in response to simple and choice auditory cues. Results indicated that the martial arts group generated a greater body-weight adjusted peak torque with both legs at all speeds during isokinetic extension and flexion, and in isometric extension but not flexion. In isokinetic and isometric trunk flexion and extension, martial artists tended to have higher peak torques than controls, but they were not significantly different ($p > 0.05$).

During the SRT and CRT tasks the martial artists were no quicker in lifting their hand off a button in response to the stimulus [reaction time (RT)] but were significantly faster in moving to press another button [movement time (MT)].

In conclusion, the results reveal that training in a martial art increases the strength of both the flexors and extensors of the leg. Furthermore, they have faster movement times to auditory stimuli. These results are consistent with the physical aspects of the martial arts.

Kesava Chandran et al., (2004) found the effect of Respiratory functions in Kalaripayattu practitioners. Kalaripayattu, an ancient traditional martial art form of Kerala, is considered as the basis for all martial arts viz. Karate, Kungfu, etc. physiological studies are more concentrated on Karate, Kungfu and other martial arts due to their global acceptance.

Considering the limited knowledge available regarding the physiological profiles of Kalaripayattu practitioners, the present study was taken up for filling the lacunae in the field. Lung function tests were carried out in ten Kalari practitioners. Residual volume was measured by indirect method.

Higher lung volumes and flow rates were achieved in Kalari practitioners compared to age and height-matched controls.

Better mechanical factors and lower airway resistance influenced during Kalari practice might have benefited in improving hung volumes and flow rates.

Yong Tai Wang et al., (2004) investigated the effects of Tai Chi exercise on physical and mental health of college students. The purpose of this pilot study is to examine the effects of Tai Chi Quan, a body-mind harmony exercise, on college students' perceptions of their physical and mental health.

A three-month intervention of Tai Chi exercise was administered to college students, and multidimensional physical (PHD) and mental (MHD) health scores were assessed using the SF-36v2 health survey questionnaire before and after the intervention. Thirty college students participated in a 1-hour-long Tai Chi exercise intervention twice a week for 3 months.

Each practice session included 10 minutes of breathing and stretching exercises followed by 50 minutes of Tai Chi Quan 24-form practice. PHD including physical function (PF), role physical (RP), bodily pain (BP), general health (GH), and MHD including social function (SF), role mental/emotion function (RE), vitality (VT), perceptions of mental health (MH) were assessed.

The normalized scores of each variable and the combined PHD or MHD scores before and after the Tai Chi intervention were examined by paired t- test ($p < 0.05$).

Physical measures of BP and GH, and mental measures of RE, VT and MH were significantly improved after Tai Chi exercise intervention. When the overall PHD or MHD scores were evaluated, the MHD had increased significantly.

In conclusion, Tai Chi exercise had positive effects on the self-assessed physical and mental health of college students. Scores on the mental health dimension appeared to be particularly sensitive to change.

Colleges/universities might consider offering Tai Chi as a component of their ongoing physical activity programs available to students.

4.5 Methodology:

For the present study 60 kalaripayattu performers, from Kollam, Kerala aged between 20-35 years were selected as the subjects. All the subjects were assigned to Experimental group - I (kalaripayattu), Experimental group - II (yoga), Experimental group - III (kalaripayattu and Yoga) and Control group - IV no practice consisting of 15 subjects in each group.

The experimental group I practiced kalaripayattu and experimental group II practiced Veerabhadrasana, Ekapadasana, Natarajasana, Garudasana, Ustrasana, Sarvangasana, Malasana, Kapalabati, Bhramari, Ujjai, deep relaxation and Meditation, experimental group III combined kalaripayattu and yoga for twelve weeks for six days per weeks.

The body coordination and flexibility were measured by Stork Balance Stand Test and Sit & reach test.

4.6 Results and Discussions on body coordination:

The data pertaining to the variables collected from the four groups before and after the training period were statistically analyzed by using Analysis of Covariance (ANCOVA) to determine the significant difference and tested at 0.05 level of significance. The following tables illustrate the statistical result of the influence of yoga practices among kalaripayattu performers.

Table 4.1: Analysis of Covariance of on Body Coordination

	Exp. Gr.I	Exp. Gr.II	Exp. Gr.III	Con. Gr.IV	SV	SS	df	MS	Obtained F
Pre-Test Mean	27.8	27.73	37.93	27.86	**B**	0.33	**3**	0.33	0.08
					W	76	**56**	76	
Post Test Mean	34.46	34.86	35.6	28.13	**B**	536.93	**3**	178.97	**71.18***
					W	140.8	**56**	2.51	
Adjusted Post Test Mean	34.46	34.86	35.6	28.13	**B**	536.75	**3**	178.9	**69.92***
					W	140.73	**55**	2.55	

** Significant at 0.05 level Table F-ratio at 0.05 level of confidence for 3 and 56 (df) =2.77, 3 and 55 (df) = 2.77*

Table 4.2: Scheffe's Post-hoc Test of Body Coordination

Exp. Gr. I	Exp. Gr. II	Exp. Gr. III	Con. Gr. IV	Mean difference	Required C. I
34.47	-	-	28.13	6.33*	1.67
-	34.86	-	28.13	6.73*	1.67
-	-	35.60	28.13	7.47*	1.67
34.47	34.86	-	-	0.40	1.67
34.47	-	35.60	-	1.14*	1.67
-	34.86	35.60	-	0.74	1.67

***** *Significant at .05 level*

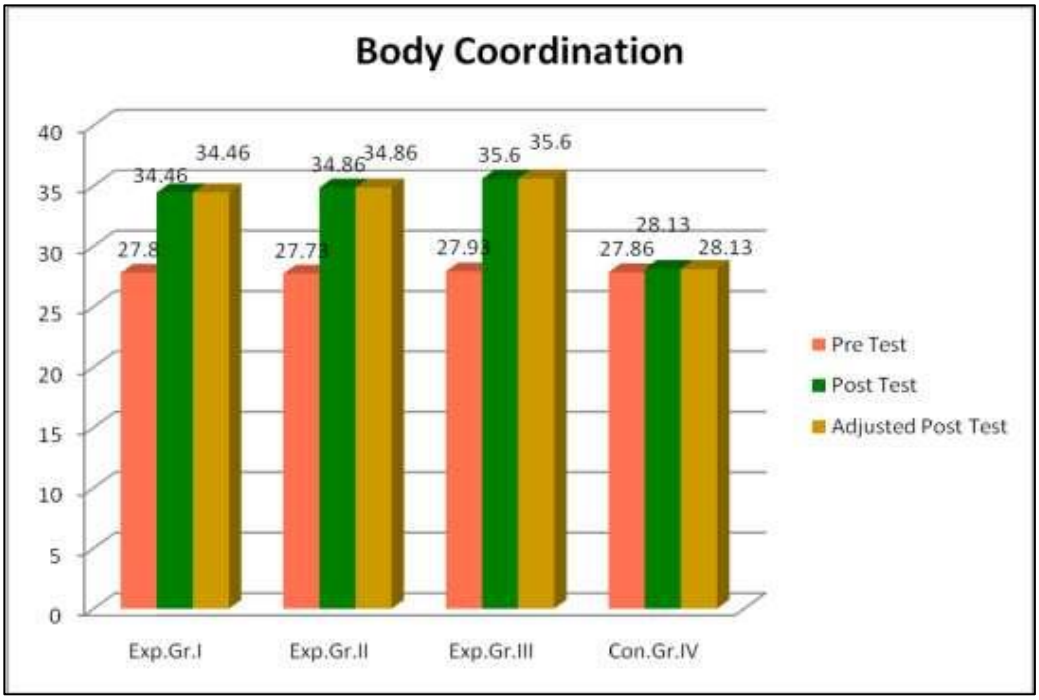

Figure 4.1: Bar Diagram on Means of Body Coordination

4.6.1 Results of Body Coordination:

The analysis of covariance of body coordination data between pre-test and post-test of the four groups have been presented in Table 4.1. Table 4.1 shows the analysis of covariance of body coordination.

The pre-test means of experimental I, II, III and control groups were 27.8, 27.73, 27.93 and 27.86 respectively. Since the obtained F-ratio of 0.08 is lower than the table value, F-ratio of 2.77, the pre-test means were not significant at 0.05 level of confidence with the degrees of freedom 3 and 56.

The posttest means of experimental I, II, III and control groups were 34.46, 34.86, 35.6 and 28.13 respectively. The obtained F-ratio of 71.18 is seen to be higher than the table F-ratio of 2.77. Hence, the differences among the post-test means were significant at 0.05 level of confidence with degrees of freedom 3 and 56.

The adjusted post-test means of experimental I, II, III and control groups were 34.46, 34.86, 35.60 and 28.13 respectively. Since the obtained F-ratio of 69.92 is higher than the table F-ratio of 2.77 the adjusted post-test mean difference amount the four groups were significant at 0.05 level of confidence with the degrees of freedom 3 and 55.

Scheffe's post-hoc test was resorted-to, to find out the significance of ordered adjusted final means difference among the groups. Table 4.2 shows the Scheffe's post-hoc test results. The ordered adjusted means, differences between means and Scheffe's Post Hoc test F-ratio of experimental I, II, III and control groups were tested for significance against Scheffe's post-hoc test F ratio.

4.7 Results and Discussions on Flexibility:

The data pertaining to the variables collected from the four groups before and after the training period were statistically analyzed by using Analysis of Covariance (ANCOVA) to determine the significant difference and tested at 0.05 level of significance. The following tables illustrate the statistical result of the influence of yoga practices among kalaripayattu performers.

Table 4.3: Analysis of Covariance of on Flexibility

	Exp. Gr.I	**Exp. Gr.II**	**Exp. Gr.III**	**Con. Gr.IV**	**SV**	**SS**	**df**	**MS**	**Obtained F**
Pre-Test Mean	25.3	25.6	25.5	25.3	**B**	1.2	**3**	0.4	0.13
					W	173.73	**56**	3.1	
Post Test Mean	32.8	33.1	36.4	25	**B**	1059.26	**3**	353.1	**195.64***
					W	101.1	**56**	1.8	
Adjusted Post Test Mean	32.7	33.1	36.4	24.9	**B**	1057.7	**3**	352.6	**192***
					W	101	**55**	1.8	

** Significant at 0.05 level Table F-ratio at 0.05 level of confidence for 3 and 56 (df) =2.77, 3 and 55 (df)= 2.77*

Table 4.4: Scheffe's Post-hoc Test of Flexibility

Exp. Gr. I	Exp. Gr. II	Exp. Gr. III	Con. Gr. IV	Mean difference	Required C. I
32.80	-	-	25.00	7.80*	1.41
-	33.07	-	25.00	8.07*	1.41
-	-	36.47	25.00	11.47*	1.41
32.80	33.07	-	-	0.27	1.41
32.80	-	36.47	-	3.67*	1.41
-	33.07	36.47	-	3.40*	1.41

***** *Significant at .05 level*

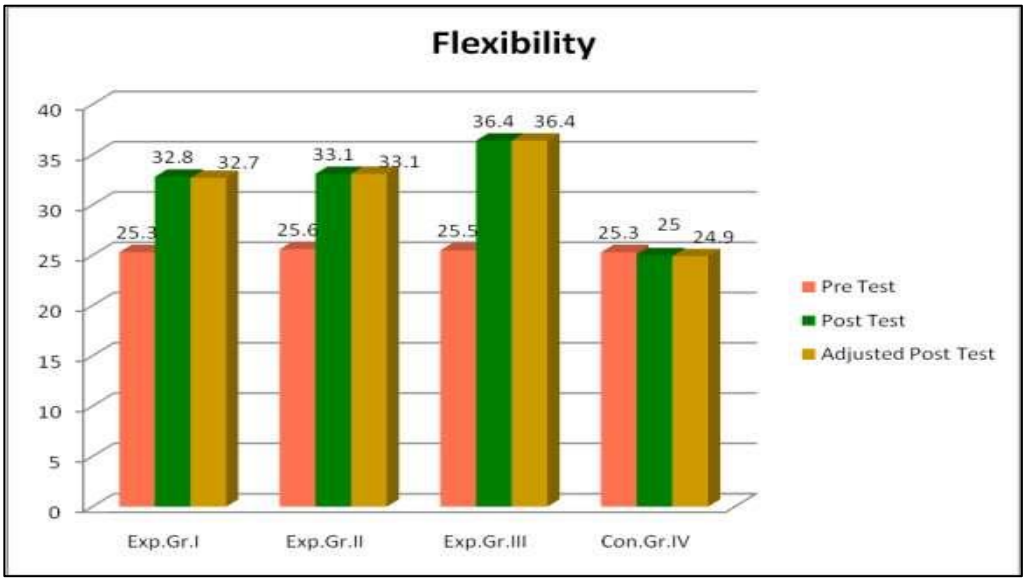

Figure – 4.2: Bar Diagram on Means of Flexibility

4.7.1 Results of Flexibility:

The analysis of covariance of flexibility data between pre-test and post-test of the four groups have been presented in Table 4.3. Table 4.3 shows the analysis of covariance of flexibility. The pre-test means of experimental I, II, III and control groups were 25.33, 25.6, 25.53 and 25.33 respectively.

Since the obtained F-ratio of 0.13 is lower than the table value, F-ratio of 2.77, the pre-test means were not significant at 0.05 level of confidence with the degrees of freedom 3 and 56. The posttest means of experimental I, II, III and control groups were 32.8, 33.1, 36.46 and 25 respectively.

The obtained F- ratio of 195.64 is seen to be higher than the table F-ratio of 2.77. Hence, the differences among the post- test means were significant at 0.05 level of confidence with degrees of freedom 3 and 56. The adjusted post-test means of experimental I, II, III and control groups were 32.7, 33.1, 36.46 and 24.9 respectively.

Since the obtained F-ratio of 192 is higher than the table F-ratio of 2.77 the adjusted post-test mean difference amount the four groups were significant at 0.05 level of confidence with the degrees of freedom 3 and 55. Scheffe's post-hoc test was resorted-to, to find out the significance of ordered adjusted final means difference among the groups.

Table 4.4 shows the Scheffe's post-hoc test results. The ordered adjusted means, differences between means and Scheffe's Post Hoc test F-ratio of experimental I, II, III and control groups were tested for significance against Scheffe's post-hoc test F ratio.

4.8 Conclusion:

Based on the results obtained, the following conclusion was drawn:

- It was concluded that experimental group I (kalaripayattu) was effective than the control group in increasing body coordination and flexibility among kalaripayattu performers.
- It was concluded that experimental group II (yoga) was effective than the control group in increasing body coordination and flexibility among kalaripayattu performers.
- It was concluded that experimental group III (combined kalaripayattu and yoga) was effective than the control group in increasing body coordination and flexibility among kalaripayattu performers.
- In comparing the three experimental groups, experimental group III combined (kalaripayattu and yoga) group was more effective in increasing body coordination and flexibility than the experimental groups I and II among kalaripayattu performers.

4.9 References:

1. Kesava Chandran C, Harikumaran Nair R, Shashidhar S. Respiratory functions in Kalaripayattu practitioners. Indian J Physiol Pharmacol. 2004 Apr; 48(2):235-40.
2. M.Prabu Effect of Kalaripayatu Training on Selected Bio Motor Variables of Handball Players. Indian Journal of Applied Research. Volume: 6 | Issue: 8 | August 2016 | ISSN - 2249-555X | IF: 3.919 | IC Value: 74.50.
3. Oliver O Donovan, Jeanette Cheung, Maria Catley, Alison H Mcgregor, An Investigation Of Leg And Trunk Strength And Reaction Times Of Hard-Style Martial Arts Practitioners. July 2006. Journal of Sports Science & Medicine 5(CSSI):5-12.
4. Sreenath S. Effect of Kalaripayattu on physical fitness variables among college students ISSN: 2456- 0057 IJPNPE 2018; 3(2): 486-488. International Journal of Physiology, Nutrition and Physical Education 2018; 3(2): 486-488.
5. Yong Tai Wang, Leslie Taylor, Marcia Pearl, Li-Shan Chang. Effects of Tai Chi exercise on physical and mental health of college students. Am J Chin Med. 2004;32(3):453-9. doi: 10.1142/S0192415X04002107