



Research article

EFFECT OF KALARIPAYATTU EXERCISES ON SELECTED MOTOR COMPONENTS AND COORDINATIVE ABILITIES OF NATIONAL LEVEL FOOTBALL PLAYERS

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Abstract

The purpose of this study was to find out the effect of Kalaripayattu exercises on motor components of national football players. To achieve the purpose of the study, sixty state football players were selected and they were divided randomly into three groups, each group consisting 20 players. The players were assigned to their responding groups such as kalaripayattu leg exercises group (KLEG), kalaripayattu animal posture exercises group (KAEG) and control group (CG). After assigning the group all the players were administered the tests on criterion variables which were considered as pre tests. The experimental groups were treated with kalaripayattu exercises for the period of 12 weeks five days a week and the control group did not participate in any training. After the treatment period was over all the subjects were administered the test on the criterion measured which was considered as post tests. The following variables were selected for the study such as motor component variables namely Explosive strength, Speed, Cardio respiratory endurance and Flexibility. All subjects were tested prior to training and after completion of twelve weeks of training on the selected variables. To analyze the collected data, investigator used Analysis of Covariance (ANCOVA) to determine the significance of mean difference among the groups. The experimental groups showed significant difference than the control group after twelve weeks of kalaripayattu leg exercises and kalaripayattu animal posture exercises training in all the selected variables.

KEY WORDS: *Kalaripayattu Leg Exercises, Kalaripayattu Animal Posture Exercises, Explosive strength, Speed, Cardio respiratory endurance, Flexibility and National Football Player.*

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INTRODUCTION

Sports training is a long continuous and systematic process of physical and mental hard work to attain high level performance in competition. By making use of various principles derived from different sports sciences such as: anatomy, physiology, kinesiology, biomechanics, psychology, bio chemistry general theory and methods of training and sports medicine. Thus it is a scientific endeavour to seek top level sports excellence. To achieve this aim there are a few very important contributing factors such as development and harmonious enhancement of motor abilities, knowledge about proper nutrition and application of suitable mechanical principals from different sports science. To performance is the outcome of an optimum development and combination of conditional and coordinative abilities.

Kalaripayattu is an ancient martial art of Kerala which has been practiced for centuries. Kalari has its own style and peculiarities according to the cultural and historical back ground of kerala. It is clearly linked to the earlier classic texts, principles and practices of Ayurveda, Dhanurveda and Yoga. The main elements of Kalaripayattu include training in physical culture, armed and unarmed combat, breathing exercises, higher form of meditation and specific class of medical treatments.

The ward Khaloorika in Sanskrit implies a place where weapon training is practiced and it generally believed that this is the origin of the ward Kalari in Malayalam to denote any institution imparting training in this martial art.

Such institutions were there throughout the country where similar training was imparted. In each region they might have been known by different names according to the different in the regional languages, such as akhad, garadi, etc. Payattu in Malayalam means fight. That is why an institution (Kalari) imparting training in fight (payattu) came to be known as Kalaripayattu.

Kalaripayattu is the indigenous martial arts of the South Indian state of Kerala. The art incorporates empty hand fighting exercises, weapons drills, vital point attack, massages and healing methods for muscular and bone problems **(Dick luijendijk, 2008)**. The immediate capacity of an individual to perform many varied stunts or athletic event is referred to as general motor ability **(Devinder K. Kansal, 1996)**.

Precisely when the association football came into vogue is unknown. Its modern team format of 11 players against 11 in a specifically measured area or playground is well defined and its origin is normally attributed to the British in the nineteenth century. However, there is ample evidence of some form of football being played in China. Roman emperor Julius Caesar is said to have introduced the game to England. Foot ball is perhaps the oldest of India's favourite sports. It is played all over the country and is as popular here as it is in Europe and Latin America. Among the Indian states, Bengal holds the distinction of being the first to popularise this game before it spread to other parts of the country. All India Football Federation (AIFF) is an affiliate

of the Indian Olympic Association. This

world body was founded in 1937.

motor ability related variables of national football players.

OBJECTIVE OF THE STUDY

The objective of the study is to find out the effect of kalaripayattu exercises on

METHODOLOGY

The purpose of the experimental study was to determine the effect of kalaripayattu basic leg exercises and animal posture exercises on selected motor components among state football players those have participated in national level football tournaments. For this purpose sixty state football players were selected for this study and they were divided randomly into three groups, each group consisting 20 players. The players were assigned to their responding groups such as kalaripayattu leg exercises group

(KLEG), kalaripayattu animal posture exercises group (KAEG) and control group (CG). After assigning the group all the players were administered the tests on criterion variables which were considered as pre tests. The experimental groups were treated with kalaripayattu exercises for the period of 12 weeks and the control group did not participate in any training. After the treatment period was over, all the subjects were administered the tests on the criterion measures which was considered as post tests.

TOOLS AND TECHNIQUES

Table- I

S. NO	VARIABLES	TEST ITEMS	UNITS
1.	Explosive strength	Standing broad jump	In metre
2.	Speed	50 yards dash	In seconds
3.	Cardio respiratory endurance	Cooper's 12 min run/walk	In Meters
4.	Flexibility	Sit and reach test	In centimetres

TRAINING PROGRAMME

Training duration = 12 weeks

Frequency = 5 days per week

Sessions = 1 sessions of 60 minutes per day.

Training schedule was prepared with the help of experts in kalaripayattu. Loads were fixed based on the level of

experience of the subject and the expert's opinion. The training was fixed for kalaripayattu leg exercise group (KLEG) a programme of 12 weeks, 5 days per week and one session, (6.30 am to 7.30 am) of 60 minutes.

The training was fixed for kalaripayattu animal posture exercise group (KAEG) a programme of 12 weeks, 5 days per week and one session (6.30 am to 7.30 am) 60 minutes.

Kalaripayattu Leg Exercises:

Nerkaal, Konkaal, Veeyhukaal, Thirichukaal, Eruthikaal, Malarnnethirichiruthikai, Soochikaal, Soochikaalmalarnnethirichithikai, Akamkaal/Puramkaal, Dikkukaal.

Kalaripayattu Animal Posture Exercises:

Gajavadivu (Elephant stance), Simhavadvu (lion stance), Aswavadivu(horse stance), Matsyavadivu(fish stance), Maarjaaravadivu(cat stance), Varaahavadivu(wild boar stance), Kukkudavadivu(cock stance), Sarpavadivu(snake stance).

STATISTICAL TECHNIQUE

The data collected from the subjects were analyzed using the following statistical techniques. To find out the significant improvement in each variable

due to kalaripayattu leg exercises and kalaripayattu animal posture exercises Analysis of Covariance (ANCOVA) was used.

RESULTS AND DISCUSSION

ANALYSIS OF EXPLOSIVE STRENGTH

The ANCOVA was used to find out any significant difference among the kalaripayattu leg exercise group, kalaripayattu animal posture exercise group and control group and presented in Table – II.

TABLE-II

ANALYSIS OF COVARIANCE AMONG KALARIPAYATTU LEG EXERCISE GROUP, KALARIPAYATTU ANIMAL POSTURE EXERCISE GROUP AND CONTROL GROUP ON EXPLOSIVE STRENGTH

	Kalarip ayattu Leg exercise Group	Kalarip ayattu Animal posture Group	Control Group	Source of Variation	Sum of Squares	Df	Mean Square	F
Adjusted Mean	2.48	2.50	2.35	Between	0.254	2	0.127	82.425*
				Within	0.086	56	0.002	

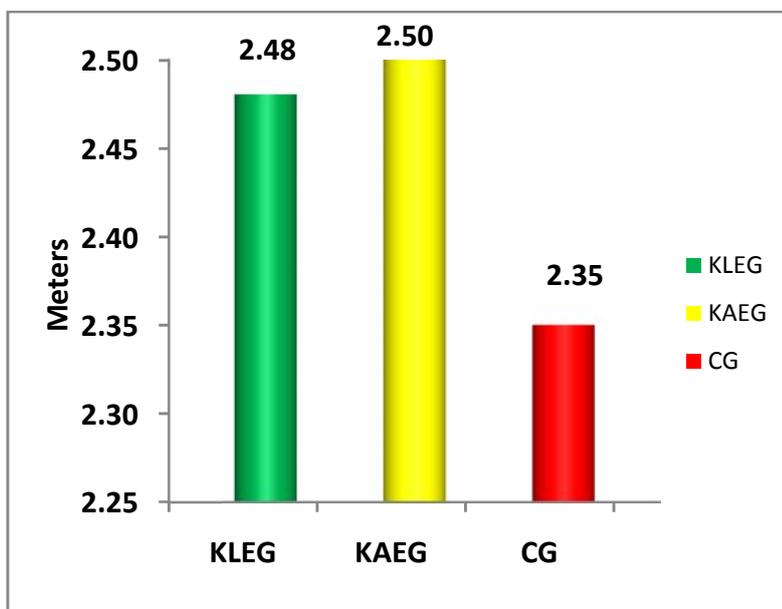
Table II depicts that there exists significant differences among the three groups. Since significant differences were recorded, Sidhak Value was calculated to find out the significant difference between the paired means.

The significant differences exist between kalaripayattu leg exercise group and Control group, and between kalaripayattu animal posture exercise group and control group.

The graphical representation of the adjusted mean values of experimental

groups and control group on Explosive Strength are presented in. Figure-1

FIGURE -1
ADJUSTED MEAN VALUES ON EXPLOSIVE STRENGTH OF KALARIPAYATTU
LEG EXERCISE GROUP KALARIPAYATTU ANIMAL POSTURE
EXERCISE GROUP AND CONTROL GROUP



ANALYSIS ON SPEED

The ANCOVA was used to find out any significant difference among the kalaripayattu leg exercise group, kalaripayattu animal posture exercise group and control group and presented in table – III.

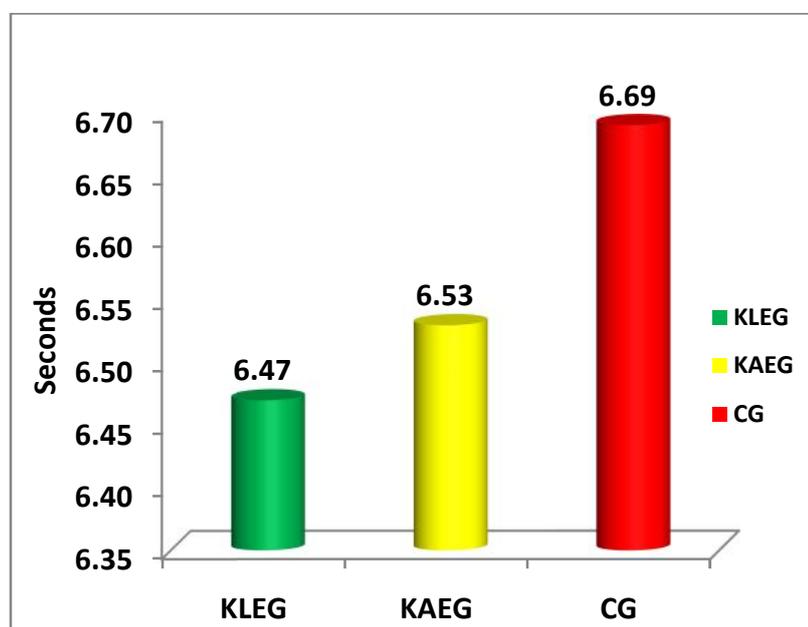
TABLE-III
ANALYSIS OF COVARIANCE AMONG KALARIPAYATTU LEG EXERCISE GROUP KALARIPAYATTU
ANIMAL POSTURE EXERCISE GROUP AND CONTROL GROUP ON SPEED

	Kalaripa yattu Leg exercise Group	Kalaripa yattu Animal posture exercise Group	Control Group	Source of Variation	Sum of Squares	Df	Mean Square	F
Adjusted Mean	6.47	6.53	6.69	Between	0.514	2	0.257	40.526*
				Within	0.355	56	0.006	

Table III depicts that there exists significant differences among the three groups. Since significant differences were recorded, Sidhak value was calculated to find out the significant difference between the paired means.

The significant differences exist between kalaripayattu leg exercise group and control group, and between kalaripayattu animal posture exercise group and control group. The graphical representation of the adjusted mean values of experimental groups and control group on Speed are presented in Figure- 2

FIGURE -2
ADJUSTED MEAN VALUES ON SPEED OF KALARIPAYATTU LEG EXERCISE GROUP
KALARIPAYATTU ANIMAL POSTURE EXERCISE GROUP AND CONTROL GROUP



ANALYSIS ON CARDIO RESPIRATORY ENDURANCE

The ANCOVA was used to find out any significant difference among the kalaripayattu leg exercise group, animal

posture exercise group and control group and presented in Table – IV.

TABLE-IV
ANALYSIS OF COVARIANCE AMONG KALARIPAYATTULEG EXERCISE GROUP, KALARIPAYATTU
ANIMAL POSTURE EXERCISE GROUP AND CONTROL GROUP ON CARDIO
RESPIRATORY ENDURANCE

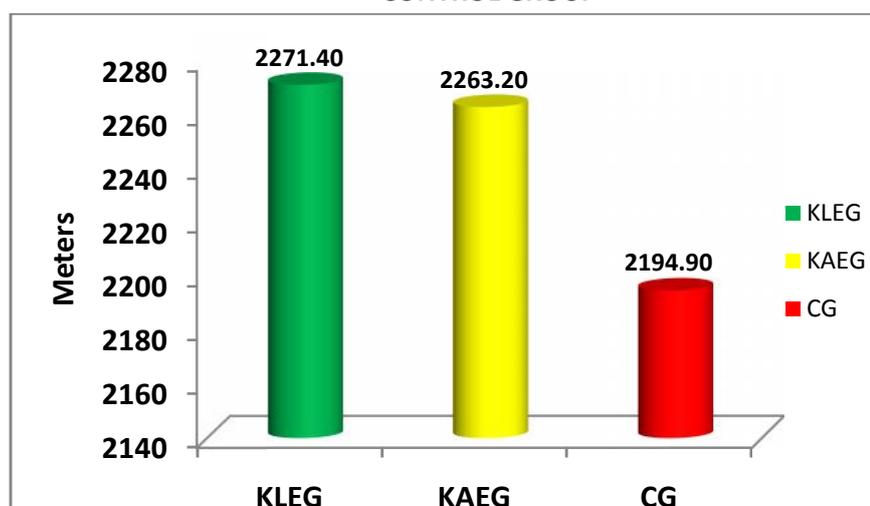
	Kalaripayattu Leg exercise Group	Kalaripayattu Animal posture exercise Group	Control Group	Source of Variation	Sum of Squares	df	Mean Square	F
Adjusted Mean	2271.40	2263.20	2194.90	Between	46016.990	2	23008.495	65.23*
				Within	20607.388	56	367.989	

Table-IV depicts that there exists significant differences among the three groups. Since significant differences were recorded, Sidhak value was calculated to find out the significant difference between the paired means.

The significant differences exist between kalaripayattu leg exercise group

and control group, and between kalaripayattu animal posture exercise group and control group. The graphical representation of the adjusted mean values of experimental groups and control group on cardio respiratory endurance are presented in Figure-3

FIGURE -3
ADJUSTED MEAN VALUES ON CARDIO RESPIRATORY ENDURANCE OF KALARIPAYATTU
LEG EXERCISE GROUP, KALARIPAYATTU ANIMAL POSTURE EXERCISE GROUP AND
CONTROL GROUP



ANALYSIS ON FLEXIBILITY

The ANCOVA was used to find out any significant difference among the kalaripayattu leg exercise group, kalaripayattu animal posture exercise group, and control group and presented in Table - V

TABLE -V
ANALYSIS OF COVARIANCE AMONG KALARIPAYATTU LEG EXERCISE
GROUP, KALARIPAYATTU ANIMAL POSTURE EXERCISE GROUP
AND CONTROL GROUP ON FLEXIBILITY

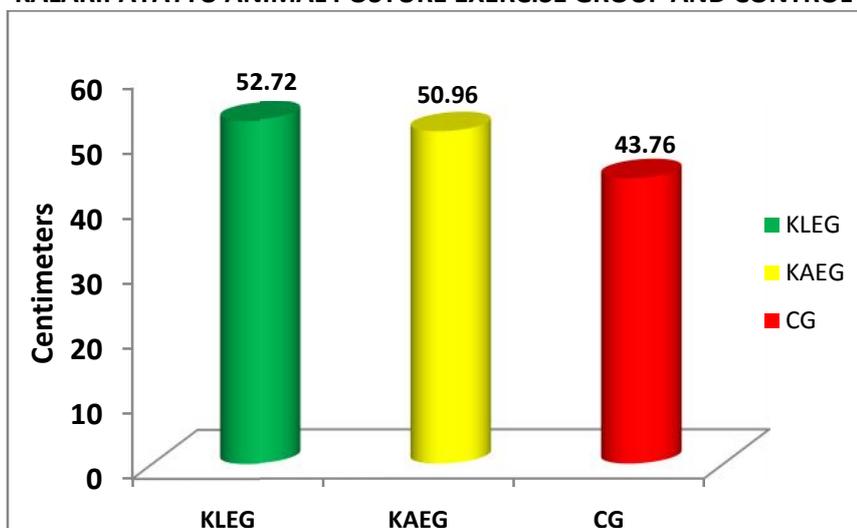
	Kalaripa yattu Leg exercise Group	Kalaripa yattu Animal posture exercise Group	Control Group	Source of Variation	Sum of Squares	df	Mean Square	F
Adjusted Mean	52.72	50.96	43.76	Between	897.472	2	448.736	112.076*
				Within	224.216	56	4.004	

Table V depicts that there exists significant differences among the three groups. Since Significant differences were recorded, Sidhak value was calculated to find out the significant difference between the paired means.

The significant differences exist between kalaripayattu leg exercise group

and control group, kalaripayattu animal posture exercise group and control group, and between kalaripayattu animal posture exercise group and kalaripayattu leg exercise group. The graphical representation of the adjusted mean values of experimental groups and control group on Flexibility are presented in Figure-4.

FIGURE-4
ADJUSTED MEAN VALUES ON FLEXIBILITY OF KALARIPAYATTULEG EXERCISE GROUP,
KALARIPAYATTU ANIMAL POSTURE EXERCISE GROUP AND CONTROL GROUP



DISCUSSION ON FINDINGS

EXPLOSIVE STRENGTH

When analysing the comparative effects between the kalaripayattu leg exercises and kalaripayattu animal posture exercises on explosive strength, analytical results of the study have shown that kalaripayattu animal posture exercise training was better than its leg exercises. But the statistical analysis showed that this result was not statistically significant. Anyhow both the experiential groups had shown significant improvements than those of the control group.

Kalaripayattu, the mother of martial arts is not only a martial art but has also many exercises that develop motor components.

Kalaripayattu is unique in its techniques, especially in the movements to be done as prescribed. These include different types of swinging of the legs, varied methods of leaps, jumps and movements with the body, attaining the shortest form as in animal posture exercises or in combat. All these tend to develop Explosive Strength of the participants. This was one of reasons for the present study.

Vijayakumar,(2000) showed in his study that there is a positive effect of kalaripayattu training on explosive strength. This was indeed one of reasons for undertaking of present study.

SPEED

When analysing the comparative effects between the kalaripayattu leg exercises and kalaripayattu animal posture exercises on speed, the result of the study showed that kalaripayattu leg exercise training improved speed better than kalaripayattu animal posture exercises. But the statistical analysis showed that the result was not statistically significant. Anyhow both the experiential groups had shown significant improvements in the aspect than the control group.

In kalaripayattu, different poses of leg exercises and animal posture exercises or vadivukal had been designed and developed to attain concentration for

perfect power and force in carrying out a particular action or staying in readiness for any action. In short, kalaripayattu provides adequate training for developing physical fitness components or motor abilities, speed, strength, and power in the trainees. This was one of the reasons for undertaking of the present study.

Kannanpugazhendi (2008) says that kalaripayattu is an ideal training method for any Indian school child for developing motor qualities like speed, strength, power, agility, endurance, co-ordination, balance timing and reflexes. This vision supported the undertaking of the present study.

CARDIO RESPIRATORY ENDURANCE

When analysing the comparative effect between the kalaripayattu leg exercises and kalaripayattu animal

posture exercises as far as Cardio Respiratory Endurance, the results of this study had shown that kalaripayattu leg

exercises training had improved better when compared to kalaripayattu animal posture exercises. Yet the statistical analysis showed that this result was not statistically significant. Anyhow both the experiential groups had shown significant improvements than the control group.

Kesavachandran (2004) showed in his study that there is a positive effect of kalaripayattu training on cardio respiratory endurance. This concept of the

FLEXIBILITY

When analysing the comparative effect of kalaripayattu leg exercises and kalaripayattu animal posture exercises on flexibility, the analytical results of the study showed that kalaripayattu leg exercises training has a more significant effect on the participant than the kalaripayattu animal posture exercises. Even the statistical analysis revealed this result was statistically significant. Both the experiential groups had shown

CONCLUSIONS

Based on the statistical analysis of the data the following conclusions were drawn.

- ❖ It is concluded that there is no significant difference between kalaripayattu leg exercises group and kalaripayattu animal posture exercises group on explosive strength.
- ❖ It is concluded that kalaripayattu leg exercises group had shown a trend in its favour than the kalaripayattu animal posture exercises group but not at significant level in explosive strength.
- ❖ It is concluded that there is no significant difference between kalaripayattu leg exercises group and
- ❖ It is concluded that kalaripayattu leg exercises group had shown a trend in its favour than the kalaripayattu animal

study supports the results obtained as such.

Kannanpugazhendi (2008) says that kalaripayattu is an ideal training programme for any Indian school child for developing his/her motor qualities like speed, strength, power, agility, endurance, co-ordination, balance timing and reflexes. This concept of the study is supported by the results of the present study.

significant improvements than the control group.

Kalaripayattu training definitely improves strength, agility, coordination, spatial awareness besides flexibility and balance. Injuries are limited because kalaripayattu exercises strengthen joints and muscles.

Shaji john (2007) showed in his study that there is a positive effect of kalaripayattu training on flexibility. This concept supports the results of the present study.

kalaripayattu animal posture exercises group on speed.

- ❖ It is concluded that kalaripayattu leg exercises group had shown a trend in its favour than the kalaripayattu animal posture exercises group but not at significant level in speed.
- ❖ It is concluded that there is no significant difference between kalaripayattu leg exercises group and kalaripayattu animal posture exercises group on cardio respiratory endurance.

posture exercises group but not at significant level in cardio respiratory endurance.

❖ It is concluded that there is a significant difference between kalaripayattu leg exercises group, kalaripayattu animal posture exercises group on flexibility.

❖ It is concluded that the kalaripayattu leg exercises have significant improvement than the kalaripayattu animal posture exercises group on flexibility.

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