

JUNIOR FELLOWSHIP PROGRESS REPORT

Period From : 1st January, 2016 To 31th December-2018

TWO (2) YEAR COMPLETE PROGRESS REPORT

Submitted

By

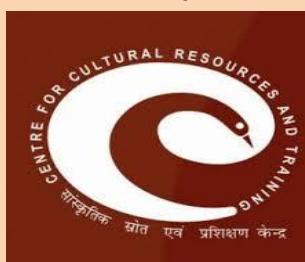


M.SYED ALI

Enrollment No : **JF20140057**

SUBMITTED

T026



CENTRE FOR CULTURAL RESOURCES AND TRAINING

(Under The Aegis Of Ministry Of Culture, Government Of India)

From

M.Syed Ali,
1-A, Mohamed Ali
Street, Tirunelveli
Town Compound,
Tirunelveli Town,
Tirunelveli, Tamilnadu.

To

The Director,
Centre For Cultural Resources and Training (CCRT),
15-A, Sector - 7,
Dwarka, New Delhi - 110075.

Respected Sir,

I wish to submit my Bound Copy of 2 year complete Project Progress report entitled "INFLUENCE OF MARTIAL ARTS SILAMBAM AND KALARI TRAINING ON SELECTED MOTOR FITNESS VARIABLES FOR SCHOOL BOYS." for consideration by the Ministry of Culture.

I confirm that this work is original and has not been published elsewhere nor is it currently under consideration for publication elsewhere.

In this Report, I report on MOTOR FITNESS VARIABLES (GRIP STRENGTH, SHOULDER STRENGTH, LEG STRENGTH, SPEED, AGILITY, FLXIBILITY). This is significant because experimental group was trained with selected Silambam and Kalari for four days a week for twelve weeks and another group acted as control group. Each training session lasted between forty five minutes to one hour approximately which included warm up and warm down periods. Control group was not involved in any specific training.

The report should be interest to readers in the areas of Silambam and Kalari Players and Cultural artists.

We trust you will find the information provided in this report constructive. I am available to meet should you wish to discuss this report in greater detail.

Thanking You,

Date : 15.01.2019

Yours faithfully,

Place : Tirunelveli

(M. Syed Ali)

JUNIOR FELLOWSHIP TWO (2)YEAR COMPLETE PROJECT PROGRESS REPORT

From : 1st January, 2016 To : 31th December-2018

Scholarship To Junior Fellowship In Different Cultural Fields

1.	Name and Address of the Scholar	M. Syed Ali
2.	File No. Assigned to him / her	CCRT/JF-3/25/2015
3.	Field/Sub-field of the Training	Folk / Traditional and Indigenous Arts Sub Field : Others
4.	Project Title	"INFLUENCE OF MARTIAL ARTS SILAMBAM AND KALARI TRAININGON SELECTED MOTOR FITNESS VARIABLES FOR SCHOOL BOYS."
5.	Detailed of Project Report Attain in the last 24 months	MOTOR FITNESS VARIABLES(GRIP STRENGTH, SHOULDER STRENGTH, LEG STRENGTH, SPEED, AGILITY, FLXIBILITY).
6.	Description of the Project Report to be imparted During the next six months	"INFLUENCE OF MARTIAL ARTS SILAMBAM AND KALARI TRAININGON SELECTED MOTOR FITNESS VARIABLES FOR SCHOOL BOYS." (Full Project)

Date :15.01.2019

M.Syed Ali

Place: Tirunelveli.

M.Syed Ali,
File No. : CCRT/JF-3/25/2015
9/1, Mohamed Ali Street,
Charnmahadevi Compount,
Tirunelveli, Tamilnadu -627006.

Declaration

I hereby declare that the dissertation entitled "**INFLUENCE OF MARTIAL ARTS**

SILAMBAM AND KALARI TRAINING ON SELECTED MOTOR FITNESS

VARIABLES FOR SCHOOL BOYS" submitted for the Junior fellowship in Ministry Of

Culture, Government of India is my original work and the dissertation has not formed the

basis for the award of any degree, diploma, associate ship, fellowship or similar other titles.

It has not been submitted to any other University or Institution for the award of any degree

or diploma.

Signature

Name : M.Syed Ali

Date: 15.01.2019

Place: Tirunelveli

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Chapter 1

Chapter I

INTRODUCTION

MARTIAL ARTS

The concept of martial art is the base for people to recognize and study martial art. In long history, descriptions on concept of martial art in different stages are different. The content and relation will be developed and changed with society and martial art.

In history there are many names associated with martial art. In the periods of Spring & Autumn and Warring States, there was “attack and defense” skill; in Han Dynasty, there is the term “martial art” which was further used in the end of Ming Dynasty. In early Ching Dynasty, the term “martial art” in “Yang Pi martial art” (military affairs) in Literary Collection in Nan Dynasty is used; it was called “Chinese martial art” in the years of Republic of China: the term “martial art” is used after the foundation of New China. Martial arts are great as spectator sports and a good way to get fit, but they really come into their own when they are used in self-defence – undoubtedly the ultimate result for many of them. The earliest evidence for specifics of martial arts as practiced in the past comes from depictions of fights, both in figurative art and in early literature, besides analysis of archaeological evidence, especially of weaponry. The oldest work of art depicting scenes of battles, dating back 3400 BC, was the ancient Egyptian paintings showing some form of struggle. Dating back to 3000 BC in Mesopotamia (Babylon), reliefs and the poems depicting struggle were found. In Vietnam, drawings and sketches from 2879 BC describe certain ways of combat using sword, stick, bow, and spears. A number of south Asian fighting styles remain closely connected to yoga, dance and performing arts. Some of choreographed sparring in silambam can be applied to dancers who knew silambam were believed to be markedly better than other performs. Until recent decades, the “chhau” dance was performed only by martial artists. Some traditional Indian classical dance schools still incorporate martial arts as part of their exercise regimen. Written evidence of martial arts in Southern India dates back to the Sangam literature of about the 2nd 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. This referred to the silambam staff which has in great demand with foreign visitors some traditional Indian classical dance

Martial arts are codified systems and traditions of combat practices, which are practiced for a variety of reasons: self-defense, competition, physical health and fitness, entertainment, as well as mental, physical, and spiritual development.

Although the term *martial art* has become associated with the fighting arts of eastern Asia, it originally referred to the combat systems of Europe as early as the 1550s. The term is derived from Latin, and means "arts of Mars", the Roman god of war. Some authors have argued that fighting arts

or fighting systems would be more appropriate on the basis that many martial arts were never "martial" in the sense of being used or created by professional warriors.

MEANING OF MARTIAL ARTS

A martial art, in essence, can be said to be something that originates in skills of war, hence its "martial" or warlike quality. Fighting disciplines range from oral traditions and folkways of tribal self-defense customs, to collected sets of techniques and finally systematic methods with established curricula and ranking hierarchies. Considerable literature has been produced over the last few decades on the question of what defines a martial art, and there is no need to review these arguments here. We can note, however, that these debates have occurred almost exclusively without regard to, or consideration of, the martial arts of Renaissance Europe. What is frequently agreed upon, though, is that mere fighting techniques alone, whether as self-defense skills for the individual or war skills for groups of armed men, do not constitute an *Art* of fighting. Just fighting can make one a fighter, after all, but to be a "martial artist" implies something more is required.

DEVELOPMENT OF MARTIAL ARTS

With the progress of history, cold weapons gradually disappear and there are plenty of productions of professional martial art weapons and martial art skill related weapons. With the setting of fighting items and rules of martial art competition, martial art has turned into one of the physical education and sports items. Physical education of martial art significantly changes the content, form and training measures of martial art. It shows that the essential concepts of the things keep changing. Nowadays, basic definition of martial art is below: martial art is mainly based on hand fighting with the forms of martial art skills and battle. It values internal and external study and is the item of Chinese traditional physical education.

Therefore, first of all, martial art is fighting skill of Chinese tradition. It includes moves such as kicking, beating, falling and catching. Attacking is demonstrated by bare hands or weapons. Battles or exercises of martial art skills are based on chess technique of Chinese tradition. Regarding social life of human beings, fighting skill cannot be exclusive in China. In comparison to fighting skills in the world, the skills of martial art are richer (such as various kicking, beating and attacking). They also demonstrate the traditional characteristics (such as quick falling and catching). Martial art skills can be hand-to-hand, combined and separated. The development is totally different from other techniques in the world. As to practice, it values internal and external studies as well as spirit and forms. It reflects the features of fighting skills in Chinese tradition.

In addition, martial art is one category of sports. It is significantly different from practical fighting techniques which will hurt people. Although martial art includes rich skills, it aims to enhance people's physical quality and defense capability by practice and have fighting in terms of capability and skills. As to techniques, it is different from the practical ones. Although hand-to-hand exercise is similar to practicing fighting, due to the regulation of competition, it will be limited to fighting sports. In conclusion, martial art reveals specific attributes of physical education which is the main social philosophy, Chinese medicine, ethics, weaponry, aesthetics, Qigong of modern martial art. It values internal and external studies, such as overall view, Ying Yang change view, form and spirit theory, Qi theory, move and statics theory, power and softness theory, etc. They gradually turn into martial art cultural system with national features. The content is rich and profound. It reveals the common characteristic of human beings' sports activities and unique philosophy, science and art in eastern civilization. It significantly demonstrates the wisdom of the Chinese in physical education field. It indirectly reflects the natural culture of the East. Therefore, in broad sense, martial art is not only a category of sports, but also a kind of national sport and precious cultural legacy accumulated by the Chinese for long term. Very few activities have as many legends and myths surrounding them as do martial arts. Hundreds of practices are included under the title of martial arts, and some of these were passed down in secrecy for many generations. Furthermore, martial arts developed in countries that have been historically isolated from the Western world. Thus, there are many conflicting theories and opinions concerning the origins of martial arts. What is known is that martial arts began in the ancient cultures of Asia, including China, India, and Japan. In both China and India, artifacts from 2,000 to 4,000 years old have been found with paintings of people striking possible martial arts poses. **Qigong**, one of the oldest systems that may be considered a martial art, is believed by some historians to be 5,000 years old or older, originating in ancient China. Some scholars trace the development of martial arts much later to the sixth century a.d. According to legend, that is when a Buddhist monk from India named Bodhidharma brought Buddhism, yoga exercises, and meditation techniques to the Shaolin Monastery in China.

SILAMBAM

Silambam is an Ancient Martial art of Tamil Nadu. The origin and historical development of Silambam fencing may have begun with the early Dravidians from ancient Tamil Nadu. Tamil Nadu (Southern Part of India) is a land of ancient glory. It has seen the rise and fall of Great Kingdoms - The Cheri, Chola, Pandya, Pallava and many others. Each of them has left behind its own valuable culture and art forms. "Silambal" is a word generally used to denote the sound created by a fast flowing spring, murmur of leaves, the chirping noises of birds etc. It might have been originally used to describe the

"whooshing" sound created by the swinging of the long staff and clashing sound of the swords. Thus Silambam became the popular word to describe the martial art that used long staff and various kinds of swords, knives and lances. Some websites give a very incorrect explanation for the word Silambam as silam means hill and bam means bamboo used in the long staff fighting. Bam and bamboo has nothing to do with Tamil language or culture. **SILAMBAM** is a **traditional stick martial art from South India**. South India has a rich culture of many thousands years, at least inherited since the Dravidian empires. The nowaday Tamil culture and people still have highly valuable gems to share, amongst them is Silambam. Though fighting with sticks is universal, it has reached there a summit in technics intricacy, complexity and efficiency. Silambam is the name in Tamil for a practice encountered throughout the whole South India. It supposedly comes from Silam or Silambu, meaning hill in Tamil, and *Bamboo*, a Marhat word. Hence Silambamboo, shortened to Silambam, roughly meaning "Bamboo from the Hills", as sticks were usually made out of a special kind of filled, yellow bamboo found there.

Silambam fencing is a combative activity and also a kind of martial art which at the improvement of one's skills. The art is a way to better the "inner-man" as well as to pretend the physical body.

Learning of Silambam and Kalari Trainings for self defence would be great use for people of all ages. Strict discipline and one's mastery over fundamentals of Silambam and Kalari Trainings are inevitable in mastering an art of self defence. An exponent of silambam fencing usually will be endowed with tremendous capacity of foot-work and the skill of speed in wielding silambam staff in different planes around his body. The quick footed moves pivot of as well as wielding techniques, contribute to in making this combative art quite handy in times of emergency or perils. Even though Silambam and Kalari Training was practiced in villages and hamlets in Tamilnadu, India. Its premonition was hindered by the British rule, then foreign power. Also, its progress was affected by bans from foreign invaders.

"The origin and history of silambam stretches back into the dim and hoary past. The originator of this sport is unknown.

Keeping with the tradition of Indian culture the origin of this art is traced to a divine source, namely lord Muruga, as he is otherwise known of silambam an in Tamil. In the mythological background of Tamil civilization. In fact, this seems to have been the primary mode of fighting in the armies of the Sangam kings. Already mentioned in the soldiers of Veerapandy Katta Bomman (1760-1866) A.D relied mainly on their skill in silambam in their skirmisher with the British army. There are so many steps in Silambam and Kalari Training they are foot work, it is used for bringing about shifts of our body weight to exert force in hicks and speed of movements But, speed and agility combined to be constantly moving around in a limited area. In the tamil language, this is

called literally „House building“ or „Fort“ . The next is staff work. The staff has mainly is about the grip. The basic grips is to held the staff at one end with the palm of the right hand, the staff flying across the palm from the wrist to the second

The long of the index finger, the finger crossing over staff. The left hand is placed above in such a way that the „v“ between the thumb and the index finger. In swings there are five types they are front swing, side-swing over head swing under arm and over arm swing. This swing are used to protect the opponent stick or we can cover our body fully. When we are swing fastly the enemy stick cannot touch your body this is a defensive skills.

In silambam cuts are so useful for turning different sides. They are 3 types top cut, low cut and mid cut. The next is chops. If the swing starts from the chest on sigttal plane, it is called „inner chop“ . If the swing approaches from outside towards the body, it is called „outer chop“ . The next is thrusts. It is useful for fake the opponents. There are three types, they are front-thrust, back-thrust and side thrust. The distal end is thrust in to the target throat, navel, thigh ankle and fore head.

The last skill is hits it is offensive skill. There are three types of hits they are under-arm-hit, over arm hit and back hit. It is use for attacking the opponent. It is very useful in silambam, when we are hitting take step forward and wait to hit the opponent

History

An Indian Traditional Martial Art In ancient days, pre historic man used a bamboo stick to protect himself from approaching animals and inimical humans. Because of its usefulness, they always had the stick with them. When they went in search of food, they had to walk long distances. Playfully they swirled the sticks that they carried with them. As and when some inimical humans attacked them with sticks, they had to defend themselves with sticks. Thus a kind of fighting with sticks began to develop.

Silambam is a weapon-based Indian martial art from Tamil Nadu, but also traditionally practised by the Tamil community of Sri Lanka and Malaysia.

It is closely related to Keralan kalaripayat and Sri Lankan angampora. It derives from the Tamil word silam meaning "hill" and the Kannada word bambu from which the English "bamboo" originates. The term silambambu referred to a particular type of bamboo from the Kurinji hills in present-day Kerala. Thus silambam was named after its primary weapon, the bamboo staff. The related termsilambattam often refers specifically to stick-fighting

There are numerous styles of silambam but the nillaikalakki discipline (from nillai meaning posture andkalakki meaning to disturb or shuffle) is the most widespread style outside India, and is most well known in Malaysia. The styles differ from one another in grip,

posture, foot work, length of the stick, etc.[1] Silambam may either be practiced for the purpose of combat (por silambam) or purely for demonstration (alangara silambam). Masters are called asaan while grandmasters are addressed as periyasaan , iyan or annaavi .

ORIGIN AND DEVELOPMENT SILAMBAM

The first stages of silambam practice are meant to provide a foundation for fighting and to condition the body for the training itself. This includes improving flexibility, agility, hand-eye coordination, kinesthetic awareness, balance, strength, speed, muscular endurance, and cardiovascular stamina. Beginners are first taught footwork (kaaladi) which they must master before learning spinning techniques and patterns, and methods to change the spins without stopping the motion of the stick. There are sixteen of them among which four are very important. Footwork patterns are the key aspects of silambam. Traditionally, the masters first teach kaaladi for a long time before proceeding to unarmed combat. Training empty-handed allows the practitioner to get a feel of silambam stick movements using their bare hands, that is, fighters have a preliminary training with bare hands before going to the stick. Gradually, fighters study footwork to move precisely in conjunction with the stick movements. In silambam, kaaladi is the key to deriving power for attacks. It teaches how to advance and retreat, to get within range of the opponent without lowering one's defence, aids in hitting and blocking, and it strengthens the body immensely enabling the fighter to receive non-lethal blows and still continue the battle. The whole body is used to create power.

In the main stance, the staff is held at one end, right hand close to the back, left hand about 40 centimetres (16 inches) away. This position allows a wide array of stick and body movements, including complex attacks and blocks. When the student reaches the final stage, the staff gets sharpened at one end. In real combat the tips may be poisoned. The ultimate goal of the training is to defend against multiple armed opponents.

Silambam prefers the hammer grip with the main hand facing down behind the weak hand which faces up. The strong hand grips the stick about a distance hand's width and thumb's length from the end of the stick and the weak hand is a thumb's length away from the strong hand. The weak hand only touches the stick and to guide its movement. Silambam stresses ambidexterity and besides the preferred hammer grip there are other ways of gripping the staff. Because of the way the stick is held and its relatively thin diameter, blows to the groin are very frequent and difficult to block. Besides the hammer grip, silambam uses the poker grip and ice pick grip as well. Some blocks and hits are performed using the poker grip. The ice pick grip is used in single hand attacks. The staff is held like a walking stick and just hand gets inverted using the wrist.

In battle, a fighter holds the stick in front of their body stretching the arms three quarters full. From there, they can initiate all attacks with only a movement of the wrist. In fact, most silambam moves are derived from wrist movement, making it a key component of the art. The blow gets speed from the wrist and power from the body through kaaladi. Since the stick is held in front, strikes are telegraphic, that is, the fighter does not hide their intentions from the opponent. They attack with sheer speed, overwhelming the adversary with a continuous non-stop rain of blows. In silambam, one blow leads to and aids another. Bluffs may also be used by disguising one attack as another.

In addition to the strikes, silambam also has a variety of locks called poottu. A fighter must always be careful while wielding the stick or they will be grappled and lose the fight. Locks can be used to disable the enemy or simply capture their weapon. Techniques called thirappu are used to counter the locks but these must be executed before being caught in a lock.

Silambam also has many different types of avoiding an attack like blocking, parrying, enduring, rotary parrying, hammering, kolluvuthal (attacking and blocking simultaneously) and evasive moves such as sitting or kneeling, moving out, jumping high, etc. Against multiple attackers, silambam exponents do not hold out their sticks as they do in single combat. Instead they assume one of the numerous animal stances which makes it difficult for opponents to predict the next attack. An expert of silambam will be familiar with varma adi or marma adi (pressure points) and know where to strike anywhere in the body to produce fatal or crippling effects by the least use of power. In one-on-one combat an expert would slide the stick to opponents wrist many times during combat. The opponent may not notice this in the heat of battle until they feel a sudden pain in the wrist and throw the stick automatically without knowing what hit them. When two experts match against each other one may challenge the other that he will hit his big toe. Hitting the big toe can produce crippling effects on the fighter, making them abandon the fight. This is called solli adithal which means "challenging and successfully hitting".

Traditional masters still encourage students to live a "pure" life through daily meditation and abstaining from drinking, smoking, and meat consumption. Students who have completed the training syllabus by learning every form are considered qualified to teach. The time it takes to complete differs from one style to another. For example, the nillaikalakki style requires around seven years of training while other styles may have no articulated syllabus.

Development of this art at the time of sieges and king About 5000 years ago, Sieges age shier, a great devotee of lord Muruga, the Tamil god, lived in the hills of Pothigai in Thirunelveli District, which is situated in Tamilnadu in south India. It is said that it was Agasthiar who invented this art of Silambam. Later on the chera, Chozha and Pandiya kings introduced this art in their

warfare and made it compulsory for all the soldiers in the five wings of their military. In the recent past, at the time of Pulidevan and Veera Pandiya Kattabomman (1760–1799) this art was resurrected and was used in the fights against the British. So the British passed orders not to practice Silambam. As for the Tamils, Silambam is not only a weapon but also a traditional Martial art. So they practiced it for the sake of physical fitness. From the south India, Silamabm spread over the rest of India and it called in different name in different part of the country. Silambam is called as Nedu Vadi in Kerala; karra saamu in Andhra Pradesh; Dhanta Varisai in Karnataka, Lathi in Uttar Pradesh; Marithani in Maharashtra; Dhal Lakadi in Gujarat; Patta Pachi in Punjab & Haryana; Kathga in Jharkhand and Bihar depending upon their language spocken in their area. Nowdays, Silambam is played in festivals like Moharram, Ram Navami, etc.

Techniques and Weapons

Silambam is a weapon-based Indian traditional martial art originated from Tamil Nadu in south India but also practiced by the traditional community of Malaysia, Singapore, Sri Lanka and Indonesia. The word silambam refers to the bamboo staff which is the main weapon used in this style. Other weapons are also used such as the Maduvu (Deer horn), Kathi (Knife) and Vaal (Sword). Unarmed Silambam called Kuttu Varisai, utilizes stances and routines based on animal movements such as the Snake, Tiger and Eagle forms.

The length of the staff depends on the height of the practitioner. It should just touch the forehead about three fingers from the head, although different lengths are used in different situations. It usually measures roughly 1.68 meters (five and a half feet). The 3 feet stick called sedikutchi can be easily concealed. Separate practice is needed for staves of different lengths. The usual stance includes holding the staff at one end, right hand close to the back, left hand about 40 centimeters (16 inches) away. This position allows a wide array of stick and body movements, including complex attacks and blocks. There are numerous sub sects in silambam like nagam-16 (cobra-16), Kallapathu (Thieves ten), Kidamuttu (goat head butting), Kuravanchi, kalyanavarisai (similar to quarterstaff), Thulukkanam, and so on. Each is unique and may differ from one another in grip, posture, foot work, method of attack, length of the stick, movement of the stick etc. The bamboo staff, one of the first weapons used in Indian martial arts, was in great demand with the visitors It is significant that in Tamil dictionaries *Silambam* is given the meaning of *cunning* and *terrorising* besides *playing with the staff*. It suggests that the use of clever and aggressive manoeuvres typified in this practice has given this name to it. In keeping with the tradition of Indian culture, the origin of this art is traced to a divine source, namely, Lord Muruga, as he is otherwise known as *Silamban* in Tamil.

In the mythological background of Tamil civilization, Sage Agasthiya is credited with the first compilation of Tamil Grammar, codification of principles of medicine and in fact with the

initiation of many aspects of civilization; hence it is no wonder that many have attributed the beginnings of Silambam to him.

The origin is also traced to the *Chera, Chola and Pandya* kings (when they were at war) by many. It is quite evident that this was patronised by all the kings of Tamilnadu beginning with the early *Sangam era*. In fact, this seems to have been the primary mode of fighting in the armies of the Sangam kings. This royal patronage was taken over by the *Zamindars* and *Palayakars* in later times when the kingdoms had broken up.

KALARI

Kalaripayattu is a martial art which originated as a style in Kerala during the 13th Century AD. The word kalari first appears in Sangam literature to describe both a battlefield and combat arena. 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. It is considered to be one of the oldest fighting system in existence. It is now practiced in Kerala, in contiguous parts of Tamil Nadu. It was originally practiced in northern and central parts of Kerala and the Tulunadu region of Karnataka. Kalaripayattu means battlefield practices or training that takes place in an arena or a gymnasium of specific dimensions with mud flooring. This is an ancient traditional martial art form of Kerala, India. Basis of all martial art form like Karate, Kungfu was originally developed from Kalaripayattu . The northern styles of Kalaripayattu are characterised by high jumping and kicking techniques, low stances, blows and blocks delivered by arms and leg that are almost fully extended and a high level of energetic and acrobatic movement. Warming up gymnastic techniques are very strenuous. Pattern of movements called Suvadus and several breathing techniques, probably taken from yoga are found in its training regimen. The exercise taught in the Kalari right from the basic of the practitioner are all designated to give strength to the lowest point in the vertebral column (Kundalani). Kalaripayattu exercises involve the usage of different body parts like hands, feet, elbow, knee and head. All these exercises or steps in Kalaripayattu were synchronised with breathing rhythm. Considering the involvement of breathing in Kalaripayattu prompt us to take up the study on lung functions in Kalaripayattu practitioners. Comparative study between performers with age and height matched controls were carried out to study the alterations of lung functions achieved by Kalaripayattupractice².

ORIGIN AND DEVELOPMENT OF KALARI

Kalaripayat had developed into its present form by the 11th century, during an extended period of warfare between the Chera and Chola dynasties. Kalaripayattu includes strikes, kicks, grappling, preset forms, weaponry and healing methods. Regional variants are classified according to geographical position in Kerala; these are the Northern style from Malabar region in

north Kerala, the Central style from inner Kerala and the southern style from Thiruvitankoor. The northern style was practiced in Kerala primarily by the Pada Nairs, a sub group of Nairs and Thiyyas, The thiyya chavers are known as'Chekavas' a sub group of Thiyyas. The famous vadakkan pattukal or the northern ballads contains the stories of these medieval Kalari warriors. These ballads are divided into two groups-the 'Thacholi pattukal', which tells the story of the Nair Thacholi family and the 'Puthooram Pattukal', which tells the story of Thiyya Puthooram family. The southern style, was practiced largely by the Nadars and has features distinguishing it from its other regional counterparts. Northern kalaripayattu is based on elegant and flexible movements, evasions, jumps and weapons training, while the southern "Adi Murai" style primarily follows the hard impact based techniques with priority on empty hand fighting and pressure point strikes. Both systems make use of internal and external concepts. Some of the flexibility training methods in northern Kalaripayattu are applied in Kerulan dance forms andKathakali dancers who knew martial arts were believed to be markedly better than the other performers. Some traditional Indian dance schools still incorporate kalaripayattu as part of their exercise regimen.

Tamil sage Agastya is regarded as the founder and patron saint of southern kalaripayat, silambam and varmam -an ancient science of healing using varmam points for varied diseases along with Lord Parasurama, especially inKerala.

The art was disseminated through schools known as kalari, which served as centres of learning before the modern educational system was introduced. Still in existence, kalaris served as meeting places for the acquisition of knowledge on various subjects ranging from mathematics, language, astronomy and various theatrical arts. More specifically, martial arts were taught in the payattu kalari, meaning fight school.

In the 11th and 12th century, Kerala was divided into small principalities ruled by chieftains that fought wars among themselves. In such wars, one-on-one duels or ankam were fought by Chekavar on an ankathattu, a temporary platform, four to six feet high. Ever since the pre-medieval era, Kaniyar, the traditional astrologer caste men of Kerala, particularly from northern region, were assigned as the preceptors of Kalaripayattu, hence, till the last century, they were known as Panickar and Asans in northern and southern regions of the state, respectively. Many of their families still maintain what remains of their old Kalaris , as heritage.

The Mappila Muslims adopted and practiced Kalaripayattu as their own. The ballads of North Kerala refer to Muslims trained in Kalaripayattu. For instance, the hero of the northern ballads Thacholi Othenan (Manikoth Thacholi Udayanakurup) bowed before Kunjali Marakkar, the Muslim commander of the Zamorin, and offered him presents before opening his kalari. The traitor who killed Thacholi Othenan was also a Mappila discipline of Kadirur Gurukkal. Some

Mappilas were trained in Hindu institutions known as Chekor Kalaris. The Paricha Kali is an adaptation of Kalaripayattu, and the Mappila tradition of this art is called Parichamuttu. It is mentioned that some panikkars had between 8,000 to 9,000 disciples, who were trained as fighting forces for the local rajahs. One of the most prominent Ezhava panikkars was Arattupuzha Velayudha Panikkar, Kalaripayattu had developed into its present form by the 11th century, during an extended period of warfare between the Chera and Chola dynasties. Kalaripayattu includes strikes, kicks, grappling, preset forms, weaponry and healing methods. Regional variants are classified according to geographical position in Kerala; these are the Northern style from Malabar region in north Kerala, the Central style from inner Kerala and the southern style from Thiruvitankoor. The northern style was practiced in Kerala primarily by the Pada Nairs, a sub group of Nairs and Thiyyas, The thiyya chavers are known as 'Chekavas' a sub group of Thiyyas. The famous vadakkan pattukal or the northern ballads contains the stories of these medieval Kalari warriors. These ballads are divided into two groups-the 'Thacholi pattukal', which tells the story of the Nair Thacholi family and the 'Puthooram Pattukal', which tells the story of Thiyya Puthooram family. The southern style, was practiced largely by the Nadars and has features distinguishing it from its other regional counterparts. Northern kalaripayattu is based on elegant and flexible movements, evasions, jumps and weapons training, while the southern "Adi Murai" style primarily follows the hard impact based techniques with priority on empty hand fighting and pressure point strikes. Both systems make use of internal and external concepts. Some of the flexibility training methods in northern Kalaripayattu are applied in Keralan dance forms and Kathakali dancers who knew martial arts were believed to be markedly better than the other performers. Some traditional Indian dance schools still incorporate kalaripayattu as part of their exercise regimen.

Existence of Martial arts in India for over 3000 years can be proved by the mention of martial arts in the Vedas. According to ancient folklore, Lord Vishnu's disciple Parasurama who was an avatar of Lord Vishnu is believed to be the founder of martial arts in India. Kalaripayattu, which is the most popular amongst many martial arts practiced in India, is believed to have been founded by Parasurama. Kalaripayattu is probably the oldest form of martial arts in India. The word kalaripayattu is a combination of two words, namely, „kalari“ and „payattu“ which mean training ground and fight. Kalaripayattu is an ancient art form and is considered to be one of the oldest forms of martial art in Indian and across the world. During the peak of its popularity, kalaripayattu was used as a code of combat by the South Indian dynasties. Kalaripayattu reached its zenith during the hundred years of war between the Cholas, Pandiyas and Cheras. The constant fighting between the princely states helped the fighters in refining the art into a martial art form.

Many martial arts in India have been forgotten due to neglect and lack of proper documentation of their existence but kalaripayattu has stood the test of time. During the

13th and 16th centuries, the art gained dominance and was incorporated into many religions as well. It was customary in Kerala to have all children above the age of seven to obtain training in kalaripayattu. Martial arts in India were considered as a code of life for many. However, during the British occupation, martial arts in India suffered major set backs. The ruling British objected to the tradition of training with and carrying arms. Laws were passed and were implemented with zest to prevent the people from practicing and training in kalaripayattu. These laws were put in place by the British to quell the chances of any form of mutiny or rebellion among the natives. But the British had underestimated the love of martial arts in India and kalaripayattu was secretly practiced and kept alive during the colonial occupation of India by the British. The art was practiced by people in rural areas to avoid an confrontation with the authorities. Thus, one of the main martial arts of India survived the dark times where curbs were imposed on its practices. On being declared independent, martial arts in India were in vogue again as they could now be practiced without hesitation. Lost glory of kalaripayattu was regained slowly and steadily. Many movements and postures in the art of kalaripayattu are believed to be inspired by the raw strength of animals and are also named after them. There is a strong belief that this art was developed in the forests when hunters had observed the fighting techniques of different animals.

Kalaripayattu means Practicing the arts of the battlefield. Kalari means battlefield. Kalaripayattu is sometimes in short called as Kalari. It is today more prevalent in the south Indian state of Kerala. This art is said to have had its origin with Rishi Agastya and Parashurama. Agastya is a great name in Ayurveda – the main Indian medical system. Parashurama is also said to have reclaimed the submerged Kerala from the Arabian Sea (Will write on this aspect of Kerala someday) The oldest reference to this martial art is found in the Rigveda and Atharvaveda. In Rigveda it is mentioned that lord Indra defeated the daemon Vritasura using one of the marmam techniques of Kalari. Marmam are pressure points in the human body and experienced practitioners can disable or kill their opponents by a mere touch of the opponent“ s Marmam.

This technique is taught only to the promising and level headed persons, to prevent its misuse.

BACKGROUNDS OF KALARI

A kalari is the school or training hall where martial arts are taught. They were originally constructed according to vastu sastra with the entrance facing east and the main door situated on the centre-right. Sciences like mantra saastra, tantra saastra and marma saastra are utilized to balance the space's energy level. The training area comprises a puttara (seven tiered platform) in the south-western corner. The guardian deity (usually an avatar of Bhagavathi, Kali or Shiva) is located here, and is worshiped with flowers, incense and

water before each training session which is preceded by a prayer. Northern styles are practiced in special roofed pits where the floor is 3.5 feet below the ground level and made of wet red clay meant to give a cushioning effect and prevent injury. The depth of the floor protects the practitioner from winds that could hamper body temperature. Southern styles are usually practiced in the open air or in an unroofed enclosure of palm branches. Traditionally, when a kalari was closed down it would be made into a small shrine dedicated to the guardian deity. se kalari was located at Alappuzha.

GRIP STRENGTH

Grip strength is the force applied by the hand to pull on or suspend from objects and is a specific part of hand strength. Optimum-sized objects permit the hand to wrap around a cylindrical shape with a diameter from one to three inches. Stair rails are an example of where shape and diameter are critical for proper grip in case of a fall. Other grip strengths that have been studied are the hammer and other hand tools. In applications of grip strength, the wrist must be in a neutral position to avoid developing cumulative trauma disorders (CTD's).

SHOULDER STRENGTH

Shoulder Strength is a vital factor on which the sports performance depends, depending upon the magnitude and type of resistance to be tackled in various sports, helping the sportsmen of different sports and different level and type of strength to achieve good performance.

Strength is a conditional ability i.e., it depends largely on the energy liberation processes in the muscles. Strength is also perhaps the most important motor ability in sports as it is a direct product of muscle contractions. All movement in sports is caused by muscle contractions and therefore strength is a part and parcel of all motor abilities technical skill and tactical actions. Strength and strength training therefore, assume high importance for achieving good performance in all sports. The role of strength training for general health, good posture and for prevention of injuries is usually overlooked which in the long run can prove harmful. Zimmermann has very rightly pointed out the positive effects of strength training on muscles, bones, joints, heart, circulatory system, metabolism and nervous system

In sports movements, strength always appears in some combination with the duration and speed of movement i.e., in combination with endurance and speed abilities. In all sports movement, whether fast or slow, movements have to be done under lesser or higher conditions of fatigue. Even for sprints some amount of strength endurance is required in the last phase or in heats. Strength endurance, therefore, is important in most of the sports.

In sports depending on the nature of movements the above-mentioned strength abilities can appear in complex form. In weight lifting and throws the strength required is a combination of maximum strength and explosive strength. This combination is also known as power. In sports where maximal resistances are to be tackled under fatigue conditions the strength required is a combination of maximum strength and strength endurance.

Strength is ability of muscular or muscle groups to exert force against given resistance. Strength is determined by measuring the maximum time of force that can be exerted. This is referred to as one repetition maximal. Each person needs a certain level of strength. Without strength, it would be impossible to carry out most of the simple tasks that are necessary each day. It is interesting to note that approximately 95% of average Indian college girls lack sufficient strength to do one regular pull-ups. (**Louise chang.MD,2008**)

LEG STRENGTH

Leg strength plays a vital role in the daily activities of man. It is an essential factor for including in almost all games and sports. There is an old saying than an athlete will go only as long as his legs will carry him. Jumping ability depends on strong muscles and tendons and flexibility of the ankle, knee and hip joints. One of the best measures of human power is broad jump.

Leg strength is very essential for sports persons, especially athletes. The strength of a muscle is related to its cross sectional area or girth. The larger the muscle, the stronger it is. Strength training increased the contractile protein that gives the muscle its pulling power. By comparing strength to performance, it is possible to determine if more strength is needed. If an athlete's performance improves with increased strength then strength training is to be recommended. "Leg dynamometer" is the best used to measure the leg strength.³

SPEED

Speed is one of the main requisite, which enable for higher performance in certain tasks. A person is born with muscles capable of working at speed. "It is the performance prerequisite to do motor actions under give conditions (movement task, external factors, individual prerequisites) in minimum of time". (**Hardayal Singh, 1991**)

"Speed is the capacity of moving a limb or parts of the body or level system of the whole body the greatest possible velocity".

"Speed may be defined as the rate at which a person can propel his body or parts of his body through space". (**Frank William Dick, 1980**)

AGILITY

Agility is the ability to change the body's position efficiently, and requires the integration of isolated movement skills using a combination of balance, coordination, speed, reflexes, strength, endurance and stamina.

In sports, agility is often defined in terms of an individual sport, due to it being an integration of many components each used differently (specific to all sorts of different sports). Sheppard and Young (2006) defined agility as "a rapid whole body movement with change of velocity or direction in response to a stimulus."

Agility is the ability to change the direction of the body in an efficient and effective manner.

FLEXIBILITY

Flexibility refers to the absolute range of movement in a joint or series of joints, and length in muscles that cross the joints to induce a bending movement or motion. Flexibility varies between individuals, particularly in terms of differences in muscle length of multi-joint muscles. Flexibility in some joints can be increased to a certain degree by exercise, with stretching a common exercise component to maintain or improve flexibility.

Quality of life is enhanced by improving and maintaining a good range of motion in the joints. Overall flexibility should be developed with specific joint range of motion needs in mind as the individual joints vary from one to another. Loss of flexibility can be a predisposing factor for physical issues such as pain syndromes or balance disorders. Gender, age, and genetics are important for range of motion. Exercise including stretching often improves flexibility.

Many factors are taken into account when establishing personal flexibility: joint structure, ligaments, tendons, muscles, skin, tissue injury, fat (or adipose) tissue, body temperature, activity level, age and gender all influence an individual's range of motion about a joint. Individual body flexibility level is measured and calculated by performing a sit and reach test, where the result is defined as personal flexibility score.

AIMS AND OBJECTIVES OF SILAMBAM ART AND KALARI

1. To promote and propagate the Art of Silambam art as a means of Sport, health improvements and self-defence.
2. To accept affiliations from countries those who are interested in the art of Silambam art.
3. To provide exhibitions in the art of Silambam art.
4. To promote understanding among players of all races and to provide a source of exercise for physical, mental, moral and social well development.

5. To encourage, organize, control and sponsor Silambam art as a sport in the whole World

STATEMENT OF THE PROBLEM

The purpose of the study was to find out the "INFLUENCE OF MARTIAL ARTS SILAMBAM AND KALARI TRAINING ON SELECTED FDR SCHOOL BOYS" variable such as Grip Strength, Shoulder Strength Leg Strength Speed, Agility and Flexibly. Particularly, the study was conducted to investigate if there were any significant differences in Grip Strength, Shoulder Strength Leg Strength Speed, Agility and Flexibly among the participants due to the Effect of Silambam Artist .

OBJECTIVES OF THE STUDY

The following are the specific objectives

1. To study the Influence of Martial Arts- silambam and Kalari Training on motor fitness Variables for School Boys.

HYPOTHESES

On the basis of literature gone through research the following hypotheses are formulated. It was further hypothesized that there might be significant improvement on the selected Psychological components (**Aggression**) due to Silambam Art

DELIMITATIONS

1. This study was delimited to the male Silambam and Kalari Players only.
2. The study was delimited to the age group of 13 to 15 years.
3. Only one Motor Fitness variables were taken into consideration for this study Motor Variable Grip Strength, Shoulder Strength Leg Strength Speed, Agility and Flexibility,
4. The subjects were randomly selected knowing Silambam and Kalari Arties
5. Treatment was confined to only for One hour daily from Monday to Saturday for the total period of twelve weeks continuously.
6. Selected Silambam and Kalari Training were only given as the treatment for experimental group.

LIMITATIONS

The research study has been limited in the following and these limitations would be taken into consideration while operating the data

1. While conducting this study the external factors like atmosphere conditions, cultural influence, day-to-day activities and socio-economic conditions and also the body structure of the subjects were not taken into consideration.
2. No attempt was made to control the subjects participating in other extra curricular activities.

Ground reaction force values were not taken into consideration

SIGNIFICANCE OF THE STUDY

The study will facilitate the evaluation of the contribution of specific Silambam and Kalari Training practices towards modern sports and Culture

The findings of the study would be of great value in designing and administering Motor Fitness Variables using specific Silambam and Kalari Training practices.

1. The results of the study may help coaches to formulate the training programmes to improve the standard of Silambam and Kalari Players.
3. This study may help the future research scholars to select new problem related to this study.

DEFINITIONS OF THE TERMS

Martial Arts

Martial arts are codified systems and traditions of combat practices, which are practiced for a variety of reasons: self-defence, competition, physical health and fitness, entertainment, as well as mental, physical, and spiritual development.

SILAMBAM

Silambam is a weapon-based Indian martial art from Tamil Nadu, but also traditionally practised by the Tamil community of Sri Lanka and Malaysia. It is closely related to Keralan kalaripayat and Sri Lankan angampora.

The origin of word Silambam is supposed to be two. One is that Silam means “up on the hill” then Bam means “bamboo stick”. The other is that onomatopoeia of distinguished swinging stick sound in Tamil language. Silambam is the stick martial technique practiced in Tamil Nadu States, broadly popular among locals. Generally it uses a kind of flexible cane, but without oil putting on it.

Shahul Hameed.M,(2006)

“Silambam fencing is a combative activity and also a kind of martial art which at the improvement of one’s skills. The art is a way to better the “inner-man” as well as to pretend the physical body.

KALARI

The word Kalari means "threshing floor" or "battlefield" in Malayalam. Training for Kalaripayattu, a martial art of Kerala is traditionally done inside the Kalari.

It's the distinguished martial arts system of Kerala State since ancient times. The word Kalari was derived from “Kalurika”, which means “training arena for soldiers” in Sanskrit. Therefore, Kalaripayattu means “the martial training which takes place inside kalari arena”

Prasad Gurukkal S.R.D.,(2006) Kalaripayattu is a Martial art which originated as a style in Kerala during 3rd century BC to the 2nd century AD. The word kalari first appears in Sangam literature to describe both a battlefield and combat arena. 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. It is considered to be one of the oldest fighting system in existence. It is now practiced in Kerala, in contiguous parts of Tamil Nadu. It was originally practiced in northern and central parts of Kerala and the Tamilnadu region of Karnataka.

GRIP STRENGTH

Grip strength keeps popping up in fitness-related headlines. Because it is so fundamental to daily function and it has been shown to be a clear indicator of cardiovascular health and mortality. Plus, it's obviously cool—many classic strongman feats involved grip; an impressive grip is baked into our social norms as something extraordinary and impressive. Le Wine, (**Howard, M.D.,2016**)

SHOULDER STRENGTH

In this study the length, strength and weight of the arm and its segments were measured and correlated with the maximum speed of voluntary movements. (**Philip.Rasch,2013**)

LEG STRENGTH

The objective of the following exercises is to help improve lower leg strength and foot speed. Prior to starting any training, it is recommended you have a medical examination to ensure it is safe for you to do so. (**MACKENZIE.B.,1997**)

SPEED

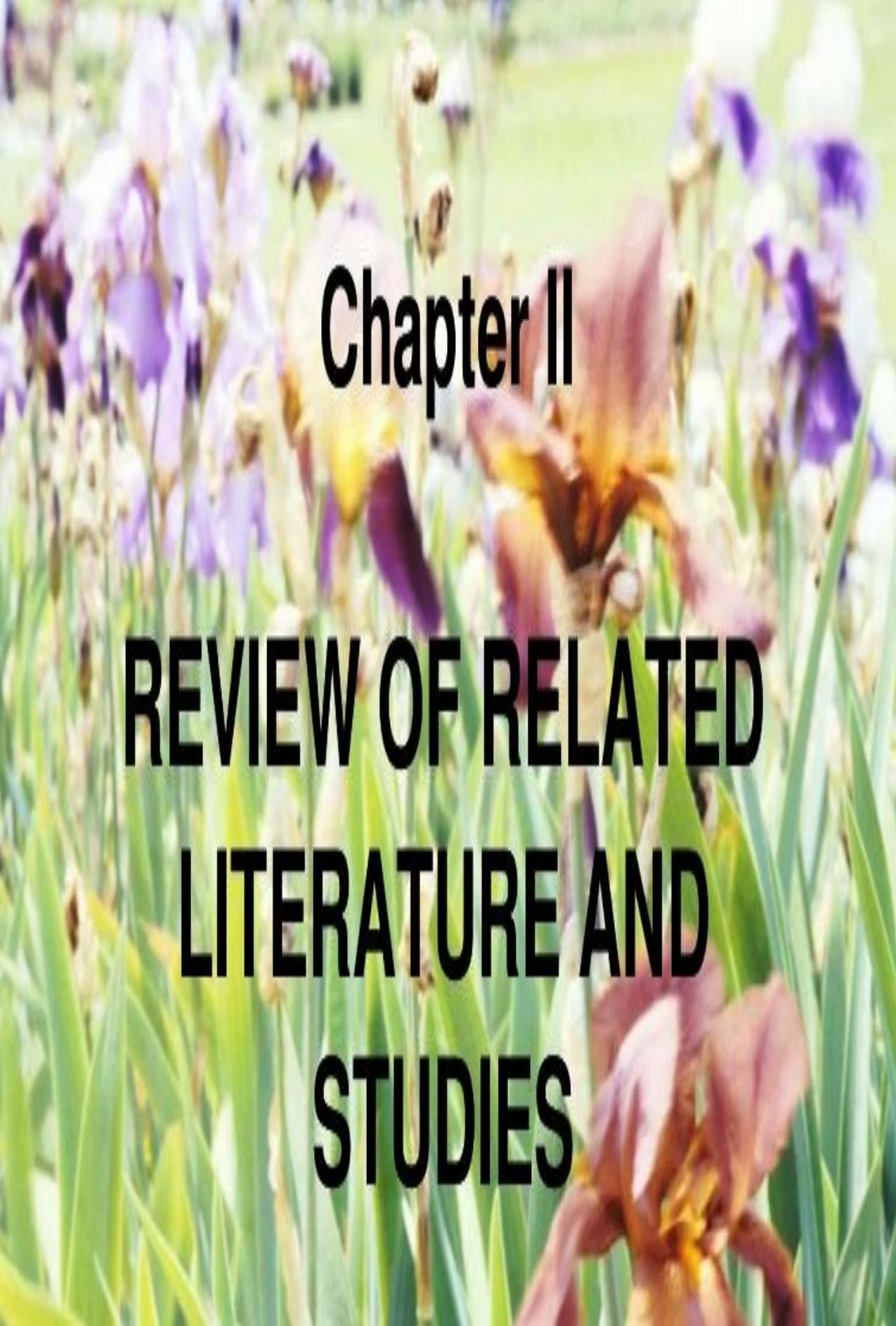
Bucher says, “Speed is the ability of the individual to make successive movements of the same kind in the shortest period of time”. Speed is the number of movements per unit of time.

AGILITY

Agility is generally defined as the ability to change direction quickly and effectively while moving early as possible at full speed.

FLEXIBILITY

Flexibility is the functional capacity of the joint to move through a full range of movement.



Chapter II

REVIEW OF RELATED LITERATURE AND STUDIES

CHAPTER II

REVIEW OF LITERATURE

John W.Bunn pointed out that the hammer should be released in a plane that is at an angel of approximately 45^0 with the horizontal. The low point of the head of the hammer should be opposite the right shoulder and the high point opposite. Practice swinging in this plane will tend to assume the correct angle of release and a time of flight will produce the greatest possible distance.

“The arms of thrower should be fully extended at the movement of release in order to crate the greatest linear velocity. In the preliminary swing, he can gain speed by extending the arm at the down ward swing and shortening it on the upswing. If the centripetal force of the hammer thrower was so great it will not go off tangent from his axis of rotation. After release, the thrower should continue his rotation inside the hammer circle to avoid following hammer and thus leaving the circle”. The experience of a silambam player is quite similar to that of a hammer thrower. If the silambam fencer fails to generate centripetal force on the hammer while he was whirling the hammer and the chain, he will pulled of his feet.

Robert Gensem emphasised that

“The back swing in tennis makes on arc of movement. It involves the same mechanics as the fore swing or fore hand. The back swing always goes in the track of horizontal or sagittal plane. The shoulder must be turned more than a 90^0 torn c from the ready position. So that with the complication of the back swing you are looking over your right shoulder to see the approaching bail”. **John W.Bunn** analysed the techniques of Javelin in his books, scientific principles of coaching.

“The Javelin throw is one of the best examples in sports for proof of the principle that the total effective force is the sum of the forces of each member of the body if applied in single direction and in the proper sequence and of the resultant forces. One of the biomechanical principles of javelin throwing reminds as that in silambam fencing. The same principle total effective force is the sum of the forces of each member of the body is applied.

Wicks conducted a study on fifty male collage students they were randomly assigned to two treatment groups with visual stimulus referred-to a minor reflection of score was recorded maximum grip strength measure were taken on an ad instable grip

dynamo meter and strain gauge, trails possession with four testing sessions and the treatment groups and comparison made by the way above produced no difference due to visual and non-visual stimuli for any combination of training of session.

However there were difference (P10.50) between the fourth session means indicating a learning effect independent of treatment. A maximal grip strength measure can be achieved by third trial of teaching session and most learning appear to occur during the first 3 session.

Jackal carried out a study on one hundred third and fourth grade boys and girls. Measurements were taken on right hand was 11.45kg and 10.28kg for left hand. The person's product movement has indicate the measures of variables of right and left hand grip strength.

Correlation at various level were found between hanging time was not suitable testing procedure to determine grip strength of grip endurance with any degree of accuracy.

Fieishmen conducted a strength test for 201 strength recruits of which one among the 30 strength was a hand grip strength. The test battery included weight lifting, dynamometer tests, pull-ups sit-ups, softball throw, runs etc.

Clarka writes Arm-shoulder strength was identified as a rotated factor at five ages due to high loadings of three cable tension strength in the arm shoulder area. Elbow flexion and shoulder flexion and shoulder inward rotation, the loading were positive at ages nine, 12 and 14, and negative at age 11 and 15. Cable tension strength average (11 tests), of which these tests are a part, had significant but low loadings on this factor.

The loadings were nearly all insignificant for the other strength tests and for the maturity, physique, body size, muscular endurance and motor measures.

Jenson and fisher say that the concept that strength is to apply force elucidates the importance of strength in performance.

Even though nearly all movement are performed against some resistance, athletes perform movements against much greater resistance than usual. For example in the shot put, discuss throw, pole-vault, various, Gymnastic movements, Jumping, Running, Swimming and leaping the body segments must exert maximal force if all else remain equal greater strength often results in better performance than normal. In some athletic events strength is the primary contributor and is the fore fundamental to excellence in these events.

Jennet found that performances on agility tests were accounted for in part by reaction time, speed off movements, strength, balance, change of position. Change of direction and body size and form. A significant different was found between several mean factor scores of the athlete and non-athlete groups. But no significant difference was found between the mean factor scores for the various groups of athletes.

Lotter studied two movements basic to sports skills, a modified base ball throw and a foot kick in 105 college men. Individual differences in ability to move an arm or leg quickly were found to be unfound moderately high co-relation between the reaction ability of-right and left legs and left arms.

Stephen, conducted a research on reaction time and movement time and task specificity with 150 subjects in to three age groups shown an average, inter correlation of only 0.127 for short arm movement and 0.138 in longer movement. The correlation was non-significant and on related to age although the absolute speed of reaction time and movement time were both approximately, 12 percent faster in college men aged 22 than in 12 year old boys and 48 year old men the individual difference exhibited 14P01 cent task specificity for short verses long movement compared with only 20 percent general ability to move the arm quickly. There was also more task specificity then general quickness ability in speed reaction by means of reaction apparatus.

The neuromuscular skill is the ability to perform a combination of specific movements smoothly and effectively. It is co-ordination of all the different muscles involved, whether they are agonists, antagonists, neutralizes or stabilizers. In other words, skill is the ability to use the correct muscles at the correct time with the exact force necessary to perform the desired movements occur as a result of muscles contract only in response to nerve impulses. Therefore, co-ordinated movement occurs if nerve impulses the proper muscular at the correct time.

Co-ordination is the ability to integrate muscles movements in to an efficient pattern of movement co-ordination makes, the difference between good performance and poor performance. The efficiency of skill patterns depends upon the inter-relation of speed, agility balance and muscular in to a well co-ordinated pattern. The child must understand the movements to be performed and see the relationship of each movement to the total pattern .

Familiarity with the literature related to any problem helps the scholar to discover what is already known, what others have attempted to find out, what methods of approach

have been promising or disappointing and what problems remain to be solved. The review would enable the investigator to have a deep insight, clear perspective and a better understanding of a chosen problem and the various factors connected with the study. “The literature in any field forms the foundation upon which all future work will be built”

The research scholar had come across several books, periodicals, journals, internet and unpublished thesis while searching for relevant facts and findings that are related to his present study. Such of those facts are given below for a better understanding and to justify his study.

D. Sakthignanavel5 in his study thirty normal male volunteers had undergone a 12 weeks training course of Silambam and Kalari, aerobic exercise and pranayama with aerobic exercise. The results show that the Silambam and Kalari group marked as higher degree in vital capacity ($p<0.05$). The aerobic group shows greater cardio respiratory endurance and muscular endurance than the other groups. But the combined Silambam and Kalari aerobic group shows a greater improvement in all aspects than the other three groups ($p<0.05$).

M.S. Balasubramanian⁶ and B. Pansare conducted a study on “Effect of Silambam on Aerobic and Anaerobic Power of Muscles”. Aerobic power (VO₂ max) and anaerobic power were estimated in medical students before and after six weeks of Silambam training. A significant increase in aerobic power and a significant decrease in anaerobic power were observed. This may be due to conversion of some of the Fast Twitch (F.T) muscle fibres into slow Twitch fibres (S.T) during Silambam training.

D.D.Madanmohan,⁷ e.g. conducted a study on the effect of Silambam and Kalari training on visual and auditory reaction times (RTs), maximum expiratory pressure (MEP), maximum inspiratory pressure (MIP), 40 mg Hg test, Grip Strength after expiration (BHT exp), Grip Strength after inspiration (BHT insp), and hand grip strength (HGS). Twenty seven student volunteers were given Siambam training for 12 weeks Our results show that Siambam practice for 12 weeks results in significant reduction in visual and auditory RTS and significant increase in respiratory pressures, breath holding times and HGS.

Moorthy (1992) conducted a study on minimum muscular fitness of school children of the age group of six to eleven years and compared the influence of selected Martial ART exercises and physical exercises on them. In that study, 1000 children (517 boys and 429 girls) from second and eleventh standard attended at three schools in Pune. 90 boys and 90 girls from the failure group were randomly allotted to control group. Experimental group I (physical exercises) and Experimental group II (Silambam and Kalari Group) underwent the treatment for a period of six weeks. He concluded that both experimental groups showed significant improvement also the improvement in the Silambam and Kalari Group was greater than in physical exercise group.

Roy Ramesh Chandra⁸ (1984) conducted a comparative study of the effect of Silambam and Ballistic exercise of college student at the Lakshmibai College of Physical Education, Gwalior. The data was collected in a seven weeks experiment in August to September 1964. The subjects were randomly assigned to two groups. While group „A“ was put under a training programme consisting of five selected Silambam, group „B“ was put under a training programme consisting of five ballistic exercises analogous to the Silambam. The Silambam and exercises were chosen for their alleged contribution to improved performance in running and broad jump. Measurement in running broad jump were taken at the beginning and at the end of experiment.

The mean gains of group „A“ and group „B“ were tested for significance by „t“ test. This difference was not found to be significant even to 5 per cent level of confidence. Performance in running and broad jump can be improved significantly by both Silambam and ballistic exercises.

Choarote, Karambelkar and Bhole (1974) stated that vital capacity in ml and Grip Strengthin seconds are measured respectively in 147 females and 139 males between ages 18 and 50 before and after three weeks of training in 20 Silambam, two breathing practices and three Vichu at nine Silambam camps were held during the year 1959 to 1969. An average increase of 15 seconds in Grip Strength was observed after the training period, which was found statistically significant.

Durgalakshmi (1989) conducted a study on “Effect of Silambam exercises on selected physiological variables of high school boys”. The group consisted of 60 students. The result of the study showed that Grip Strength remains unchanged after a six week training of Silambam.

The scores in Grip Strength and vital capacity had also improved. It was statistically significant. She also recommended that the athletes could adopt these exercises and thereby increase in the cardio-respiratory function and further she adds, Silambam could be included in the regular programme of physical education in schools and colleges **Dhanraj**10 (1974) studied that the effects of Siambam and the 5 Bx fitness plan on selected physiological parameters. The results indicated increase in basal metabolic rate total volume in basal state, T-4 thyroxin, hemoglobin, blood cell PWC 130, vital capacity, chest expansion, Grip Strengthand flexibility after Silambam training. Decreases in heart rate were also observed. When Silambam training was discontinued for six weeks following in treatment a significant decline in the values of PWC 130, flexibility and Grip Strength were noticed.

Twenty four incumbents of Anand Ashram, Pondichery and 33 persons practicing body building exercise were tested. It was found that there was significant reduction is blood pressure, heart rate and respiration after physiological activity followed by Savasana, even less than the resting value, which is statistically significant ($P<-0.001$).

Raghuraj11 et al., (1998) studied heart rate variability (HRV) is an indicator of the cardiac autonomic control. Two spectral components are usually recorded, viz. high frequency (0.15-0.50 Hz), which is due to vital efferent activity and a low frequency component (0.05 to 0.15 Hz), due to sympathetic activity. The present study was conducted to study the HRV in two Silambam and Kalari Practices which were previously reported to have. opposite effects, viz. sympathetic stimulation (Ariyal Seeta Veechu,) and reduced sympathetic activity. Twelve male volunteers (age range, 21 to 33 years) were assessed before and after each practice on separate days. The electrocardiogram (lead J) was digitized on line and an off-line analysis was done. The results showed a significant increase in low frequency (LF) power and LF/HF ratio while high frequency (HF) power was significantly lower following Ariyal Seeta Veechu. There were no significant changes following Ariyal Seeta

Veechu. The results suggest that Arial Seeta Veechu modifies the autonomic status by increasing sympathetic activity with reduced vital activity. The study also suggests that HRV is a more useful psycho physiological measure than heart rate alone.

The literature in any field forms the foundation upon which all future work will be built. If we fail to build upon the foundation of knowledge provided by the review of literature, the researcher might miss some works already done on the same topic. The review of the literatures has been classified under the following headings.

Thomas W. Woodward,(2009) Martial arts are ancient forms of combat, modified for modern sport and exercise. Participation in the martial arts is increasing, particularly for youth. Martial arts provide health-promoting and meaningful exercise for millions of practitioners. Benefits from this practice include better overall health and balance, as well as an improved sense of psychological well being. They do not promote aggression and may be used as a treatment modality for youth who are at-risk for violence.

Vishnu Namboodiri, M.V (1979)explained how Kalari and Silambam training culture influences almost all our art forms. Theyyam, Thira, Kanyarkali, Velakali, Kumattikali, Margamkali, Parichamuttikali and classic art forms like Krishnattam, Thidambu Nrittam Kathakaliand Vichu, Addi, Oddi, Varal, Kuthu and vettu are related to Kalarippayattu and Silambam training. Poorakali originated in the tradition of Kalarippayattu and Silambam training. Poorakali requires great physical fitness and flexibility on the part of the artist. The Kacha and nelai tied to the waist and the Angapurappadu in the beginning of the performance are reminiscent of preparation for war.

NarayanaPisharoti K.P (1989) explained the significance of Kalarippayattu to Kerala culture and Parichamuttukali and Kayyankali are described as the hobbies of Kalarippayattu practitioners. Kathakali is an important dance-drama from Kerala. A Kathakali artist should be proficient in Kalarippayattu in order to attain physical flexibility. Kottarakara Thampuran and Kottayam Thampuran selected Kathakali artiste from their soldiers well-trained in Kalarippayattu.

Balakrishnan.P (1994) gave a beautiful narration of the origin, the construction, practice and the use of weapons in the Silambam training. It included vaithari (oral command) for each item especially for students and practitioners. He also gives a simple

explanation about Silambam training with Veechu, AddiMurai, Val Veechimurai and Thee Silambam training.

Patrick Denaud (1994) explained the importance of Kalarippayattu and Silambam training handed down from generation to generation which was based on animal fighting. Kalarippayattu and Silambam training proceeds from two great principles; the mind is in charge in the body and one's opponent is vanquished by turning the latter's own force back on him. The masters of former times, having withdrawn to the solitude of the mountains to live in harmony with nature and to mediate, studied and observed the movements of various animals, and from these creatures they learned their main defense and attack positions.

Phillip Zarrilli.B (1994) disclosed in his book “Kalarippayattu: a South Indian martial Art and the Silambam training and Ayurvedic paradigms” evaluated how all the three namely Kalari, Silambam training and Ayurveda can be effectively utilized in three namely Kalari, Silambam training and Ayurveda can be effectively utilized in treatments. Effect of Silambam training on Varmas in the human body was also under study.

Phillip Zarrilli.B (1998) made the first in-depth study and stated that Kalarippayattu and Silambam training are one of India's traditional martial arts, based on his association, training and practice with many Kalari and Silambam training Gurukkal in Kerala and Tamilnadu from 1976 to 1993. This ethnographic monograph provides the first comprehensive account of Kalarippayattu and Silambam training as an integral part of Kerala and Tamilnadu culture and an evolving Malayali and Tamilan identity. He provided a complete account of the outer forms, the inner secreretes and the Varma treatment. Carving out a niche for themselves in these new economies, Kalarippayattu practitioners must run their Kalaris and Silambam training as small businesses— either as martial arts school and/or as clinics, and compete with other karate/self-defense schools, Kalari and Silambam training or clinics for students and patients, the author suggested. He also made clear the similarities between Kalarippayattu and Silambam training. He described that Kerala and Tamilnadu basic art form Kalarai and Silambam training with his twenty years of research and practice in Kerala and Tamilnadu.

Vijayakumar.K (2000) narrated the historical perspective as well as various Kalari practices in Kerala. According to him the Gurukkal gave consent to start a new Kalari only when the practitioner is an expert in Uzhichil and Kalari treatment. Similarly, along with the

knowledge of Marma points, the practitioner should acquire mental control and practical wisdom. The author explained the influence of Kalarippayattu on many cultures and art forms existed in Kerala society. He has thrown open in the last two chapters, which were relevant for future study, on the influence of the Kalari on many classical and other dance forms and the society.

Green Thomas A (2001) described ‘Kalari’ as a ‘place of training’ and ‘payattu’ as an exercise. Along with physical exercises, meditation and massage are important aspects of Kalarippayattu training.

David Manual Raj (1976) observed the practical value of Silambam training as a magnificent self defense art. He taught, researched, demonstrated and wrote about the discipline. His book on Silambam training, written in English, was the first of its kind and is regarded as the most authentic reference book on this ancient art. This manual is a new presentation on Silambam training with action photographs that help to find a new, challenging and enjoyable route to health.

Dearbhla Kelly (2010) described Varma treatment; the grace of oil massage on straw mats awakens the circulation of prana. The author says that he travelled half-way around the world to Kerala to receive Kalari treatment. Treatment is administered by the Gurukkal or highly skilled martial artists. The author was lucky enough to attend a Kalari workshop with Gerhard Schmid, a senior Kalari student from Hamburg, Germany. The author had multiple fractures in a severe car accident when he was 19 years old. Gerhard was sure that the post accident lopsidedness could be reversed with Kalari treatment.

Maya Tangeberg (2010) engaged in the task of training professional actors for 40 years stated that the basic movements of Silambam training anchor the body and develop the flexibility of the spine. The actor student continues to develop his inner and outer acting skills. He also gets the ability to focus his mental and physical powers to make his presence felt on the stage and convey subtle suggestions.

Mahesh Kidangil (2012) is a Kalari Gurukkal by profession and in his study with Kalari treatment and Marma treatment revealed the unique feature of Kalari treatment for many diseases. A science of medicine which had developed with war and different aspects of Kalarippayattu are discussed in detail.

An elaborate study on Bodhidharma's teaching and Kalari and Silambam training practices is included. He emphasized how qualities like concentration, speed, strength, Intelligence, virtue and prudence can be developed with many years of Kalari and Silambam training practice. The self-defense techniques like vativu, Vichuchu valuaddimurai, Ayuthaperukam and atavu form the basis of Kalarippayattu and Silambam training. This improves physical flexibility and mental strength in the practitioner. This leads to self-realization and Spiritual Truth inside the Kalari and Silambam training which cannot be found anywhere else.

T Ganesh Babu, T, Chandra kumar N (2015) conducted the study to find out the Influence of Kalarai practices and Silambam training practices on speed and flexibility among u-19 female Kho-Kho players. In order to achieve the purpose of the study forty five female district level Kho-Kho players, were randomly selected from Dindugal city schools and they were equally divided in to three groups of fifteen each as experimental group-I, experimental group-II and control group. The experimental group and control group undergone normal routine Kho-Kho practices and in addition the experimental group-I underwent Kalari practices and experimental group-II underwent Silambam training practices for one hour in the morning sessions. The control group was not given any special training. The period of training was eight weeks in a schedule of weekly three days for alternate days. The data were collected on the selected dependent variables before and after the training period. The collected data were statistically analyzed by using Analysis of Co-variance (ANCOVA) and Scheffe's post hoc test. To test the significance .05 level of confidence was fixed. Based on the results, the study was concluded that the Kalari practices and Silambam training practices significantly improved the speed and flexibility among district level Kho-Kho players.

Mohanavalli P, et.al., (2013) commented on the effect of Silambam training practice on agility and flexibility among college girls. Silambam training fencing is a martial art native to the soil of Tamil Nadu. It has been originated from 3000 B.C and practised by the pre-historic Dravidian Tamils who were dwelling in the Mohan-ja-daro& Harappa regions and is still practised today. To achieve the purpose of this study, 40 sedentary college girls were selected as subjects. The age of the subjects ranged from 18 to 20 years. The subjects were further classified random into two equal groups of 20 each. Group - I underwent Silambam training for three days per week for sixteen weeks and group - II acted as control. The selected criterion variables namely agility, flexibility and percent body fat were assessed

before and after the training period. The collected data were statistically analysed by using Analysis of Covariance (ANCOVA). From the results of the study it was found that there was a significant improvement in agility and flexibility and with no significant change in percent body fat among the experimental group when compared with the control group. Finally the investigator was concluded on the basis of the results obtained it was concluded that Silambam training resulted in a significant increase in agility and flexibility among college girls.

Singh Bal, et.al's, (2012) study was to determine the effects of 6-week Silmbam training on Grip Strength, Arm Strength and Leg Strength. The research population included 30 inter college girls (Mean \pm SD: age 21.33 ± 1.43 years, height 1.67 ± 0.036 m, body mass 62.50 ± 3.55 kg) of Guru Nanak Dev University, Amritsar, Punjab. They were purposively assigned into Kalari (M) and control (C) groups, n = 15 each. The They were purposively assigned into Kalari (M) and control (C) groups, n = 15 each. The M group was subjected to 6 week training consisting of various skills (i.e., Vichu, AddiMurai, Kai Paddam, Foot works) the control group participated in the routine training not containing the Silambam training skills mentioned. The level of $p \leq 0.05$ was considered significant. The 6-week Kalari training brought about significant improvement in Grip Strength of movement ($t = 3.45$), Arm Strength ($t = 2.98$) and Leg Strength ($t = 1.82$) in Group (M) as compared with the control one. The 6-week Kalari training had significant effect on Grip Strength, Arm Strength and Leg Strength. Thus, such Silambam training may be recommended to improve Grip Strength, Arm Strength and Leg Strength may contribute to enhance concentration based performance and voluntary control of Silambam training Vichu. Finally the investigator was concluded the findings of the study will help to understand the benefits of Silambam training had significant effect on Grip Strength, Arm Strength and Leg Strength. The present manuscript will also be useful feedback for one and all concerned with these Silambam training players

Singh Bal, et.al's, (2012) study was to determine the effects of 6-week Silambam training on Grip Strength, Arm Strength and Leg Strength. The study will help to understand the benefits of Silambam training which had significant effect on Grip Strength, Arm Strength and Leg Strength. The present manuscript will also be useful to give feedback for one and all concerned with these Silambam training players.

S. Suthakar and A. Pushparajan conducted the study to find out the effects of Silambam training and Kalari with Kalari training on agility and explosive power of

collegiate male students. 100 students were selected from Karpagam University as a subject for this study. The subjects age: body weight; height (21 ± 2.3 years; 65 ± 5.4 ; 166 ± 4.5 cm) respectively. The subjects were randomly divided into five equal groups with each group consisting of 20 subjects. Group-I underwent Silambam training, Group-II underwent Kalari training. Group – III underwent Silambam training with Kalari training, Group – IV underwent Kalari with Kalari training, Group- V acted as control group and they were not given any special treatment. The experimental period was 12 weeks. Pre-test and post-test were taken before and after the training programme. The selected physical variables were agility and explosive power. During the intervention phase, a modified training programme was offered by a well-trained Silambam training coach to the experimental group under the supervision of the researcher at Karpagam University in Tamilnadu. All participants were encouraged to continue their standard physical activities and routine procedures. The intervention phase fell for 12 weeks and included evening 60 minutes Silambam training, Kalari and Kalari coaching classes for five days in a week to find out the significant effects of Silambam training Kalari with Kalari training on selected physical variable of agility and explosive power. The ANCOVA statistical technique was used to find the mean difference between the groups on physical variables of agility and explosive power. The results of the study revealed a significant group test interaction ($p < 0.05$). Follow-up analyses indicated that the group differences in physical variables existed between the five groups of the pre-test. In post test all the experimental groups were found to have significantly ($p < 0.05$) better performance on the physical variables than the control group. The findings of the present study suggest that Silambam training with Kalari training improved the physical variables on agility and explosive power of collegiate Male Silambam training players.

S.Udhaya Shankar and Mr.M.Sivaji conducted the study was to investigate the effect of selected Kalaripayattu skills training programme on selected Abdominal strength and Muscular endurance variables of high school boys. For the present study, forty students were randomly selected as samples from Swami Shivanandha high schools, Periyanaikanpalayam, Coimbatore. They were divided into two equal groups. Each group consisted of 20 subjects. Group - I underwent Kalaripayattu skill training group (KTG), Group – II acted as control group. They didn't undergo any specific training programme. The age of subjects were ranged from 13-15 years. The researcher had selected the following variables for the present study: Abdominal strength and Muscular endurance. The selected variables were assessed by using standardized test. The training programme was fixed for five days per week over a period of eight weeks. The total duration of the training session

was fixed for sixty minutes. The data collected before and after eight weeks of training programme. The collected data was analyzed using depended t-test. The level of significance was fixed at 0.05. The findings of the present study strongly indicates that Kalaripayattu skill training has significant effect on selected psychomotor variables i.e., Abdominal strength and Muscular endurance of high school boys.

Dhokrat.G. K has undertaken a study to find out the effects of Plyometric exercise to develop the motor fitness variable of Silambam training player. This experimental design consists of an experimental group which was compared with a control group for the testing of effects of specific training programme on selected motor fitness variable i.e. Agility and Reaction Time and performance in Silambam training. This experimental design was the parallel group design where the experimental group received the Plyometric training and the control group did not. The result could be compare and the effects of ten weeks training programme. The sample of the present study comprised of 40 boys age ranged from 13 to 15 years. The collected data were analyzed by using ‘t’ test. After the ten weeks training it was found that there is an improvement in the selected motor fitness variable and also in Silambam training skill.

CHAPTER II

REVIEW OF LITERATURE

John W.Bunn¹ pointed out that the hammer should be released in a plane that is at an angel of approximately 45^0 with the horizontal. The low point of the head of the hammer should be opposite the right shoulder and the high point opposite. Practice swinging in this plane will tend to assume the correct angle of release and a time of flight will produce the greatest possible distance.

"The arms of thrower should be fully extended at the movement of release in order to crate the greatest linear velocity. In the preliminary swing, he can gain speed by extending the arm at the down ward swing and shortening it on the upswing. If the centripetal force of the hammer thrower was so great it will not go off tangent from his axis of rotation. After release, the thrower should continue his rotation inside the hammer circle to avoid following hammer and thus leaving the circle".

The experience of a silambam player is quite similar to that of a hammer thrower. If the silambam fencer fails to generate centripetal force on the hammer while he was whirling the hammer and the chain, he will pulled of his feet.

Robert Gensemer² emphasised that

"The back swing in tennis makes on arc of movement. It involves the same mechanics as the fore swing or fore hand. The back swing always goes in the track of horizontal or sagittal plane. The shoulder must be turned more than a 90^0 torn c from the ready position. So that with the complication of the back swing you are looking over your right shoulder to see the approaching bail". John W.Bunn analysed the techniques of Javelin in his books, scientific principles of coaching.

"The Javelin throw is one of the best examples in sports for proof of the principle that the total effective force is the sum of the forces of each member of the body if applied in single direction and in the proper sequence and of the resultant forces.

One of the biomechanical principles of javelin throwing reminds as that in silambam fencing. The same principle total effective force is the sum of the forces of each member of the body is applied.

Wicks³ conducted a study on fifty male collage students they were randomly assigned to two treatment groups with visual stimulus referred-to a minor reflection of score was recorded maximum grip strength measure were taken on an ad instable grip dynamo meter and strain gauge, trails possession with four testing sessions and the treatment groups and comparison made by the way above produced no difference due to visual and non-visual stimuli for any combination of training of session.

However there were difference (P10.50) between the fourth session means indicating a learning effect independent of treatment. A maximal grip strength measure can be achieved by third trial of teaching session and most learning appear to occur during the first 3 session.

Jackal⁴ carried out a study on one hundred third and fourth grade boys and girls. Measurements were taken on right hand was 11.45kg and 10.28kg for left hand. The person's product movement has indicate the measures of variables of right and left hand grip strength.

Correlation at various level were found between hanging time was not suitable testing procedure to determine grip strength of grip endurance with any degree of accuracy.

Fleishmen⁵ conducted a strength test for 201 strength recruits of which one among the 30 strength was a hand grip strength. The test battery included weight lifting, dynamometer tests, pull-ups sit-ups, softball throw, runs etc.

Clarka⁶ writes

Arm-shoulder strength was identified as a rotated factor at five ages due to high loadings of three cable tension strength in the arm shoulder area. Elbow flexion and shoulder flexion and shoulder inward rotation, the loading were positive at ages nine, 12 and 14, and negative at age 11 and 15. Cable tension strength average (11 tests), of which these tests are a part, had significant but low loadings on this factor.

The loadings were nearly all insignificant for the other strength tests and for the maturity, physique, body size, muscular endurance and motor measures.

Jenson and fisher⁷ say that the concept that strength is to apply force elucidates the importance of strength in performance.

Even though nearly all movement are performed against some resistance, athletes perform movements against much greater resistance than usual. For example in the shot put, discuss throw, pole-vault, various, Gymnastic movements, Jumping, Running, Swimming and leaping the body segments must exert maximal force if all else remain equal greater strength often results in better performance than normal. In some athletic events strength is the primary contributor and is the fore fundamental to excellence in these events. Jennet¹⁴ found that performances on agility tests were accounted for in part by reaction time, speed off movements, strength, balance, change of position. Change of direction and body size and form. A significant different was found between several mean factor scores of the athlete and non-athlete groups. But no significant difference was found between the mean factor scores for the various groups of athletes.

Lotter¹⁵ studied two movements basic to sports skills, a modified base ball throw and a foot kick in 105 college men. Individual differences in ability to move an arm or leg quickly where found to be unfound moderately high co-relation between the reaction ability of-right and left legs and left arms.

Stephen¹⁶, conducted a research on reaction time and movement time and task specificity with 150 subjects in to three age groups shown an average, inter correlation of only 0.127 for short arm movement and 0.138 in longer movement. The correlation was non-significant and on related to age although the absolute speed of reaction time and movement time were both approximately, 12

percent faster in college men aged 22 than in 12 year old boys and 48 year old men the individual difference exhibited 14P01 cent task specificity for short verses long movement compared with only 20 percent general ability to move the arm quickly. There was also more task specificity then general quickness ability in speed reaction by means of reaction apparatus.

The neuromuscular skill is the ability to perform a combination of specific movements smoothly and effectively. It is co-ordination of all the different muscles involved, whether they are agonists, antagonists, neutralizes or stabilizers. In other words, skill is the ability to use the correct muscles at the correct time with the exact force necessary to perform the desired movements occur as a result of muscles contract only in response to nerve impulses. Therefore, co-ordinated movement occurs if nerve impulses the proper muscular at the correct time¹⁷.

Co-ordination is the ability to integrate muscles movements in to an efficient pattern of movement co-ordination makes, the difference between good performance and poor performance. The efficiency of skill patterns depends upon the inter-relation of speed, agility balance and muscular in to a well co-ordinated pattern. The child must understand the movements to be performed and see the relationship of each movement to the total pattern¹⁸.

Chapter - 3

Research Methodology



Department of Information Technology
Anup Singh Chauhan (Deputy Director)
PDUV 2011

CHAPTER III

METHODOLOGY

Research methodology involves the systematic procedure by which researcher starts from the initial identification of the problem to its final conclusions. The role of the methodology is to carry on the research work in a scientific and valid manner.

This chapter provides an over view of the method used for the research study selection of subjects, selection of variables, reason for the selection of variables, reliability of data, reliability of the instrument, testers competency, subject reliability, orientation of the subjects, collection of data administration of test and statistical techniques employed are enunciated here.

SELECTION OF SUBJECTS

For the purpose of this study sixty male Silambattam and Kalari Artist as subjects in random method. The sixty Silambattam and Kalari A Artist from Govt. Hr. Sec. School, Tirunelveli Town, Tirunelveli, District, Tamilnadu (State) at random and age is ranged between 13 - 15 years. Who know's the basic skills of Silambattam and Kalari Training. Were selected as Experimental, control group. The Artist who participated District level were selected as subjects.

SELECTION OF VARIABLES

The investigator reviewed the available scientific literature pertaining to the study from books, journals, periodicals and research reports. Taking into consideration of the feasibility criteria availability of instruments, equipments and relevance of the variables to the present study. The following variables were selected

MOTOR FITNESSCOMPONENTS

- 1.Grip Strength
- 2.Shoulder Strength
- 3.Leg Strength
- 4.Speed
- 5.Agility
- 6.Flxbility

REASON FOR THE SELECTION OF VARIABLES

Silambattam and Kalari are the two important factors have the tendency to affect the performance negatively. To improve Silambattam performance one should trained baron-motor abilities in a planned and systematic manner.

SELECTION OF TESTS

The present study was undertaken primarily to assess the influence of Martial arts silambam and kalari trainings on selected motor fitness variables namely, , Grip Strength, Shoulder Strength, Leg Strength Speed, Agility, Flexibility for school boys, as per the available literatures, the following test were used to collect relevant data on the selected dependent variables and they were presented in the Table – 3.1

TABLE
SELECTION OF THE TESTS

S.No	Variables	Tests	Unit of Measurement
1.	Grip Strength	Grip Dynamometer	In Seconds
2.	Arms Strength	Push Ups	Minutes
3.	Leg Strength	Wall Squat Test	Minutes
4.	Speed	50 mts Run	In Seconds
5.	Agility	The illions agility run	In Seconds
6.	Flexibility	Sit and Reach Test	C Meters

RELIABILITY OF THE DATA

The reliability of the data was censured by establishing the reliability of the instrument, Tester's competency and Artist reliability.

RELIABILITY OF THE INSTRUMENTS

Stop watch, measuring tape, are used to find out the reliability of the instrument. Measuring tapes which are used to conduct the experiments are borrowed in a reputed company. Further these instruments were calibrated in standard units. To determine the reliability of the instruments on each of the variables hence recorded two times under similar condition using the same instrument and the score were comprised with other repeated times instruments and the score were found similar and hence the instrument will be considered as reliable.

RELIABILITY OF SUBJECTS

The subject reliability was established by test and retest coefficient of correlation for the scores in each of the criterion measures. Re-testing was done within a period of a week of initial tests in each of the criterion measures, to get data for calculating test and re-test coefficient of correlation for reliability of the subject.

TESTER'S COMPETENCY

The tester's competency was determined by pilot study. This was done by test-rested method. The performance of 30 Artist were measured. On the chosen variables of the study, the scores were recorded by the investigator on separate days. The scores obtained were correlated by using Pearson's product Moment Correlation.

TABLE
TESTER'S COMPETENCY TEST IN SELECTED VARIABLES

Sl. No	Variables	Co-efficient Correlation
1.	Grip Strength	0.92*
2.	Arms Strength	0.89*
3.	Leg Strength	0.87*
4.	Grip Strength	0.92*
5.	Arms Strength	0.89*
6.	Leg Strength	0.87*

Table value at 0.05 level = 0.632

SUBJECT RELIABILITY

The test and retest indicated subject's reliability as the same subjects were used under similar conditions by the same tester. Neither motivational techniques were used but only the training was given to the subjects.

ORIENTATION OF THE SUBJECTS

Prior to the test administration, the training and test procedures were advocated in details to the subjects to ensure proper understanding and secure effective co-operation. The investigator demonstrated practically to the subjects about the tests.

TRAINING PROGRAMME

The control group was not exposed to any specific Training. However, they were participating in their regular Physical activities. The experimental groups I and II were subjected to sixteen week of silambam and kalari training respectively. Then training was given for three days per week (alternative days). Every training session lasted for 40 to 60 minutes. The training programme was scheduled for the morning between 6.30 am and 7.30 am.

The subjects underwent their respective programme under strict supervision prior to and during every session. Subjects underwent a 10 minutes warm up and warm -down exercises which included jogging, stretching, striding and push-ups. All the subjects involved in the training were questioned about their stature throughout the training period. None of them reported any injury. However, muscle soreness was reported in the early weeks, but it subsided later.

ADMINISTRATION AND ORGANIZATION OF TRAINING PROGRAMME

The investigator conducted the silambam and kalari training programme. The investigator could personally supervise and ensure proper execution of the silambam and kalari movements with the help of trained coaches.

WARMING- UP AND WARMING – DOWN

Singh (1991) has recommended that the physical preparation for the training session is achieved through optimum warm up of the six exercises in a definite manner for the purpose of warming of the physical and physiological systems of the organism. It leads to a) increase in muscle and body temperature, b) Raising the functional level of the heart and lungs, c) loosening of muscles, ligaments and joints, d) Facilitation of motor co-ordination, e) increase in readiness for training activity. General warm-up aims at general preparedness for the training activity. It consists of jogging and stretching exercises.

COLLECTION OF DATA

The purpose of the study was to find out “INFLUENCE OF MARTIAL ARTS SILAMBATTAM AND KALARI TRAINING ON SELECTED MOTOR FITNESS VARIABLES FOR SCHOOL BOYS”. For this purpose, the research scholar followed the following procedure.

The subjects of the study were selected at random and divided into two homogeneous groups namely 'A' the Silambattam and Kalari Group experimental treatment. The control group 'B' was strictly under control without undergoing any special activity.

Group 'A' was considered as Silambattam and Kalari Group and they were under gone training 6 days at early morning from 6 A.M. to 7 A.M for 12 weeks. The experimental groups were well acquired with their allotted techniques and did only the exercise given to them for a period of 12 weeks under the personal supervision of the research scholar.

SKILLS OF SILAMBAM AND KALARI TRAINING

The main play in Silambam and Kalari Training is called „**Veechu**.“ It should be play as much as speed of the individual. Who have their optimum level of fitness.

Based on the above mentioned play is involved in the following major Silambam skills,

1. Arial Seetha Veechu
2. Bana Veechu
3. Padai Veechu
4. Ganaval Veechu

ADMINISTRATION OF TESTS - MOTOR FITNESS VARIABLES

Grip Strength (Hand Grip Dynamometer)



The purpose of this test is to measure the maximum isometric strength of the hand and forearm muscles. Handgrip strength is important for any sport in which the hands are used for catching, throwing or lifting. Also, as a general rule people with strong hands tend to be strong elsewhere, so this test is often used as a general test of strength.

Equipment required: Handgrip Dynamometer

Procedure:

The subject holds the dynamometer in the hand tested, with the arm at right angles and the elbow by the side of the body. The handle of the dynamometer is adjusted if required - the base should rest on first metacarpal (heel of palm), while the handle should rest on middle of four fingers. When ready the subject squeezes the dynamometer with maximum isometric effort, which is maintained for about 5 seconds. No other body movement is allowed. The subject should be strongly encouraged to give a maximum effort. See videos of the Handgrip Strength Test

Scoring:

The best result from several trials for each hand is recorded, with at least 15 seconds recovery between each effort. **Helen C et al. (2011)**

Shoulder Strength (Push Ups)



Equipment required: Mat or Flat floor, Stop Watch

Procedure:

The subject assumed prone support position on the mat. On being signaled, she flexed her body horizontally, so that her chest almost touched the ground. She returned back to the starting position by pushing up the body and by extending the elbows straight. She repeated this activity as fast as possible for a period of 15 seconds

Instruction:

The body was not to slag or poke, but the straight line of the body was to be maintained throughout the testing period. Incomplete push-ups were not counted.

Scoring:

Correct numbers of completed push-ups in 15 seconds were recorded. Assistance of a partner for the subject in counting was used. **Barry L. Johnson and Jack K. Nelson (1988)**

Leg Strength (wall squat test)



Introduction

One good assessment for your lower body is a wall squat test. The wall squat test will primarily measure how strong your quads are, however the hamstring and glute muscles will also come into play. It is a good assessment to do because not only will it give you a good idea on how you are progressing with your workouts but it will also enable you to see in general how capable these muscles are. In everyday life you are constantly moving in and out of this position, such as when you sit down in a chair or else walk up a staircase therefore being strong in these muscles will be very beneficial. The objective of the Wall Squat test is to evaluate the strength of your quads, hamstrings and glutes, and consequently, the success of your training regime.

Compare your scores with the following standards **Equipment required**

- A wall

Procedure:

- To start the wall squat test first stand with your back flat against a wall, your feet about a foot away and Arms width apart. Begin to squat down, keeping the small of your back pressed firmly into the wall and ensuring that your knees are tracking properly over your toes.
- Go down until you are in a comfortable position and are not feeling any excess strain on the knee joint. Try and then hold this position for up to one minute, or until you can no longer maintain proper form. You may wish to repeat the test two more times and then use the best reading you achieve, however do allow yourself a good period of rest in between to allow the legs to recover.

Scoring:

(measured in seconds). These results are for people 10 years old and under, reduce standard by 5 seconds- This test measures the strength and endurance of the quadriceps and hamstring muscles of your thighs, and the glutes of your buttocks, and consequently evaluates your training program. **Fitness2u 2013 © FRY, A. C. et al. (2014) Kansas Squat Test: A Reliable Indicator of Short-term Anaerobic Power. The Journal of Strength & Conditioning Research, 28 (3), p. 630-635**

Speed (50 Meter Dash)



Sprint or speed tests can be performed over varying distances, depending on the factors being tested and the relevance to the sport. The 50 Meter Sprint is part of the International Physical Fitness Test, and their protocol is listed here.

Purpose:

The aim of this test is to determine acceleration and speed.

Equipment required:

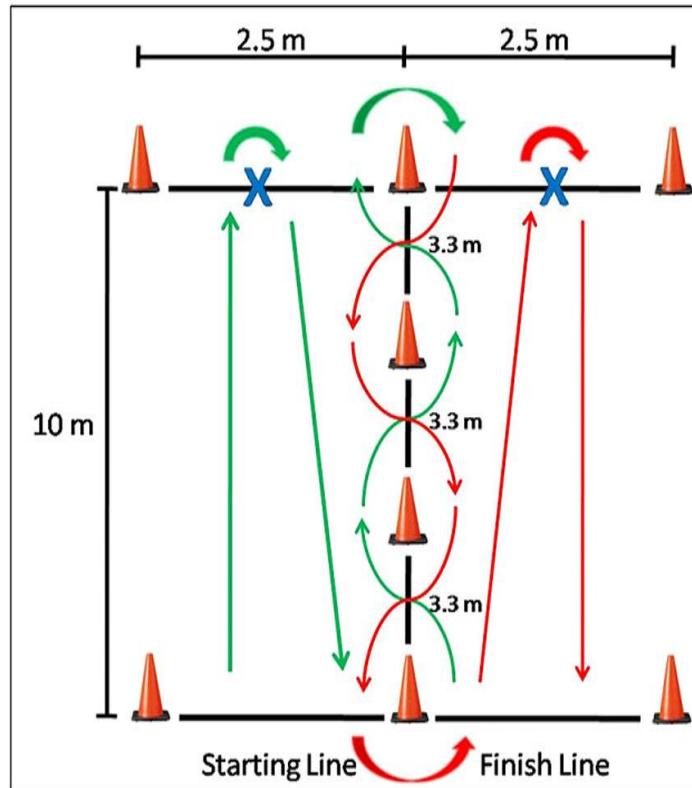
Measuring tape or marked track, stopwatch, cone markers, flat and clear surface of at least 70 meters.

Procedure:

The test involves running a single maximum sprint over 50 meters, with the time recorded. A thorough warm up should be given, including some practice starts and accelerations. Start from a stationary standing position (hands cannot touch the ground), with one foot in front of the other. The front foot must be behind the starting line. Once the subject is ready and motionless, the starter gives the instructions "set" then "go.". The tester should provide hints for maximizing speed (such as keeping low, driving hard with the arms and legs) and the participant should be encouraged to not slow down before crossing the finish line.

- **Results:** Two trials are allowed, and the best time is recorded to the nearest 2 decimal places. The timing starts from the first movement (if using a stopwatch) or when the timing system is triggered, and finishes when the chest crosses the finish line and/or the finishing timing gate is triggered. **Baechle TR and Earle RW. (2000)**

Agility (The Illinois Agility Run)



Objective: To monitor the development of athlete's agility.

Marking: The length of the course is 9.14 meter, and the width (distance between start and finish point) is 5 mts, 4 cones are used to mark, finish and the two turning points. As shown in figure 3.8

Equipment: A stop-watch, cones.

Procedure: The subject stood behind the starting line. On signal 'go', the stop watch was started and the athlete gets up as quickly as possible and runs around the course in the direction indicated without knocking the cone over, to the finish line, at which the timing was stopped.

Scoring: Two trials were given. The best time taken to complete the agility test was recorded. **Getchell B.(1979)**

Flexibility (Sit and Reach)



Objective: To measure the trunk flexion of an individual. This was determined by their ability to stretch the lower back and hamstring muscles.

Equipment: A platform.

Procedure:

Subject removed her shoes and sat with her knees fully extended and the bottom of the feet flat against the surface of the platform. Her feet's were extended forward with one hand placed on the top of the other. Steadily reach as far forward as possible and maintain that position for 3 seconds.

Instructions:

No bounding or jerking movements were allowed and it was important that the knees remain absolutely straight, slight flexion at the knee joints greatly influence the results.

Scoring:

The distance in front of or beyond the edge of the platform that can be sustained was measured and recorded. Measurements in front of the platform were negative where as those beyond were positive. **Wells,K.F & Dillon, E.k (1952).**

Experimental Design :

This study was conducted to determine possible cause and Effects of Silabam Art Training on Health Related Fitness among High School Boys. A pre and post test randomized design was employed for this investigation. This study consisted of one experimental groups, Group-I (n= 15) underwent Silambam training, and Group-II acted as control group. All the subjects were tested and immediately after the experimentation on selected Health parameters such as Speed, Agility, Flexibility .

Statistical Technique :

No attempt was made to equate the groups in any manner. Hence, to make adjustments for difference in the initial means and test the adjusted posttest means for significant differences, the analysis of covariance (ANCOVA) was used (Broota, 1989). The scheffe's test was used as post-hoc test to determine which of the paired means differed significantly where the differences in adjusted posttest means resided in univariate ANCOVA among three groups. All of the statistical analysis tests were computed at 0.05 level of significance ($P<0.05$).

Justifications for Using One-Way ANCOVA and Assumptions for ANCOVA

One-way univariate analysis of covariance (ANCOVA) was used to determine how each dependent variable was influenced by independent variables while controlling for a covariate (pre-test) (Hair, Anderson, Tatham, & Black, 1998). Analysis of covariance adjusts the mean of each dependent variable to what they would be if all groups started out equally on the covariate. In this study, pretest scores of selected variables have been shown to correlate with the posttest scores, thus they were considered as appropriate covariates.

A preliminary analysis was conducted to determine whether the prerequisite assumptions of ANCOVA were met before preceding the univariate analysis. Thus, the assumption of equality of variance (homogeneity) and the homogeneity of regression slopes were examined.

Therefore, the homogeneity of variance of comparing the three groups regardless of the ability level for each of the dependent variables indicated that homogeneity of variance has been met for all the six dependent variables.¹ Hence it was concluded that the assumption of homogeneity of variance has been met for computing univariate ANCOVA.

The test of significance of the regression of post test (dependent variable) on pre test (covariate) were analysed and presented in table III.

After determining the assumptions for computing ANCOVA have been met with the pre data analysis, the univariate ANCOVA statistical output was examined. Then, providing the ANCOVA result was statistically significant, the univariate results were examined for each dependent variable. For the significant univariate results, the post hoc comparisons were performed to identify where the differences resided. The pair wise comparisons statistics was used for the post hoc results. The results of the descriptive analysis, univariate tests, and the pair wise comparisons among the six dependent variables were reported in chapter four.

CHAPTER III

METHODOLOGY

Research methodology involves the systematic procedure by which researcher starts from the initial identification of the problem to its final conclusions. The role of the methodology is to carry on the research work in a scientific and valid manner.

This chapter provides an over view of the method used for the research study selection of subjects, selection of variables, reason for the selection of variables, reliability of data, reliability of the instrument, testers competency, subject reliability, orientation of the subjects, collection of data administration of test and statistical techniques employed are enunciated here.

SELECTION OF SUBJECTS

For the purpose of this study sixty male Silambattam and Kalari Artist as subjects in random method. The sixty Silambattam and Kalari A Artist from Govt. Hr. Sec. School, Tirunelveli Town, Tirunelveli, District, Tamilnadu (State) at random and age is ranged between 13 - 15 years. Who know's the basic skills of Silambattam and Kalari Training. Were selected as Experimental, control group. The Artist who participated District level were selected as subjects.

SELECTION OF VARIABLES

The investigator reviewed the available scientific literature pertaining to the study from books, journals, periodicals and research reports. Taking into consideration of the feasibility criteria availability of instruments, equipments and relevance of the variables to the present study. The following variables were selected

MOTOR FITNESSCOMPONENTS

1. SPEED
2. AGILITY
3. FLEXIBILITY

REASON FOR THE SELECTION OF VARIABLES

Silambattam and Kalari are the two important factors have the tendency to affect the performance negatively. To improve Silambattam performance one should trained baro-motor abilities in a planned and systematic manner.

RELIABILITY OF THE DATA

The reliability of the data was censured by establishing the reliability of the instrument, Tester's competency and Artist reliability.

RELIABILITY OF THE INSTRUMENTS

Stop watch, measuring tape, are used to find out the reliability of the instrument. Measuring tapes which are used to conduct the experiments are borrowed in a reputed company. Further these instruments were calibrated in standard units. To determine the reliability of the instruments on each of the variables hence recorded two times under similar condition using the same instrument and the score were comprised with other repeated times instruments and the score were found similar and hence the instrument will be considered as reliable.

TESTER'S COMPETENCY

The tester's competency was determined by pilot study. This was done by test-rested method. The performance of 30 Artist were measured. On the chosen variables of the study, the scores were recorded by the investigator on separate days. The scores obtained were correlated by using Pearson's product Moment Correlation.

Table I**TESTER'S COMPETENCY TEST IN SELECTED VARIABLES**

S1. NO	Variables	Co-efficient Correlation
1.	SPEED	0.92*
2.	AGILITY	0.90*
3.	FLXIBILITY	0.88*

Table value at 0.05 level = 0.632

SUBJECT RELIABILITY

The test and retest indicated subject's reliability as the same subjects were used under similar conditions by the same tester. Neither motivational techniques were used but only the training was given to the subjects.

ORIENTATION OF THE SUBJECTS

Prior to the test administration, the training and test procedures were advocated in details to the subjects to ensure proper understanding and secure effective co-operation. The investigator demonstrated practically to the subjects about the tests.

COLLECTION OF DATA

The purpose of the study was to find out "INFLUENCE OF MARTIAL ARTS SILAMBATTAM AND KALARI TRAINING ON SELECTED MOTOR FITNESS VARIABLES FOR SCHOOL BOYS". For this purpose, the research scholar followed the following procedure.

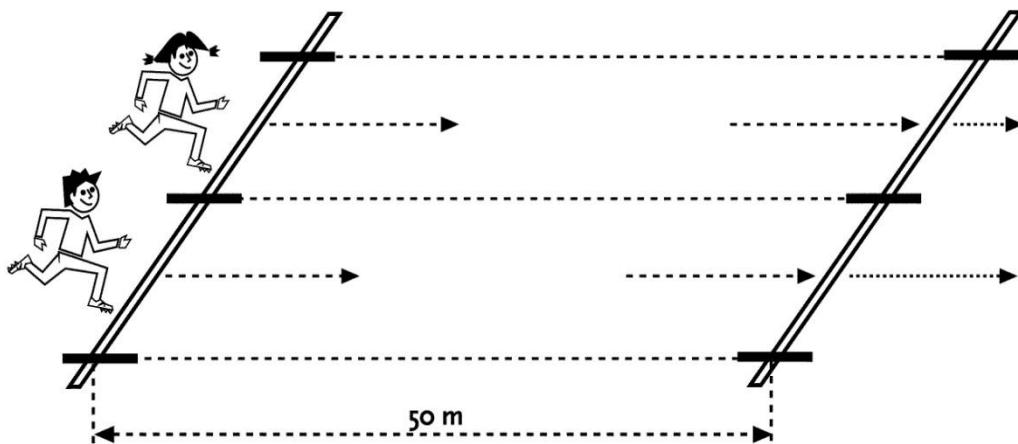
The subjects of the study were selected at random and divided into two homogeneous groups namely 'A' the Silambattam and Kalari Group experimental treatment. The control group 'B' was strictly under control without undergoing any special activity.

Group 'A' was considered as Silambattam and Kalari Group and they were under gone training 6 days at early morning from 6 A.M. to 7 A.M for 12 weeks. The experimental groups were well

acquired with their allotted techniques and did only the exercise given to them for a period of 12 weeks under the personal supervision of the research scholar.

SKILLS OF SILAMBATTAM AND KALARI TRAINING

1.Speed (50 Meter Dash)



Sprint or speed tests can be performed over varying distances, depending on the factors being tested and the relevance to the sport. The 50 Meter Sprint is part of the International Physical Fitness Test, and their protocol is listed here.

Purpose:

The aim of this test is to determine acceleration and speed.

Equipment required:

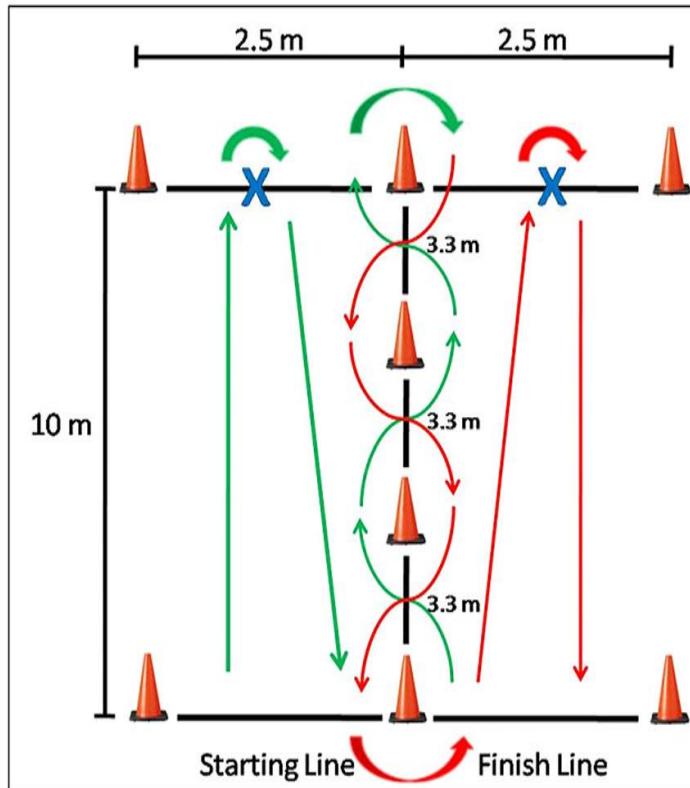
Measuring tape or marked track, stopwatch, cone markers, flat and clear surface of at least 70 meters.

Procedure:

The test involves running a single maximum sprint over 50 meters, with the time recorded. A thorough warm up should be given, including some practice starts and accelerations. Start from a stationary standing position (hands cannot touch the ground), with one foot in front of the other. The front foot must be behind the starting line. Once the subject is ready and motionless, the starter gives the instructions "set" then "go.". The tester should provide hints for maximizing speed (such as keeping low, driving hard with the arms and legs) and the participant should be encouraged to not slow down before crossing the finish line.

- **Results:** Two trials are allowed, and the best time is recorded to the nearest 2 decimal places. The timing starts from the first movement (if using a stopwatch) or when the timing system is triggered, and finishes when the chest crosses the finish line and/or the finishing timing gate is triggered. **Baechle TR and Earle RW. (2000)**

2. Agility (The Illinois Agility Run)



Objective: To monitor the development of athlete's agility.

Marking: The length of the course is 9.14 meter, and the width (distance between start and finish point) is 5 mts, 4 cones are used to mark, finish and the two turning points. As shown in figure 3.8

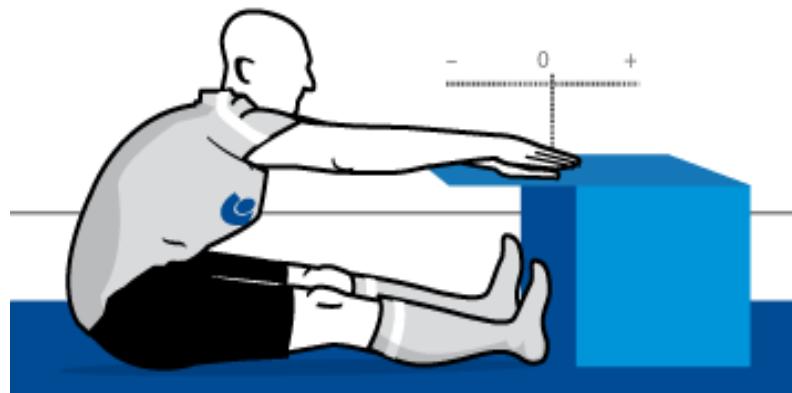
Equipment: A stop-watch, cones.

Procedure: The subject stood behind the starting line. On signal 'go', the stop watch was started and the athlete gets up as quickly as possible and runs around the course in the direction indicated without knocking the cone over, to the finish line, at which the timing was stopped.

Scoring: Two trials were given. The best time taken to complete the agility test was recorded. **Getchell**

B.(1979)

3. Flexibility (Sit and Reach)



Objective: To measure the trunk flexion of an individual. This was determined by their ability to stretch the lower back and hamstring muscles.

Equipment: A platform.

Procedure:

Subject removed her shoes and sat with her knees fully extended and the bottom of the feet flat against the surface of the platform. Her feet's were extended forward with one hand placed on the top of the other. Steadily reach as far forward as possible and maintain that position for 3 seconds.

Instructions:

No bounding or jerking movements were allowed and it was important that the knees remain absolutely straight, slight flexion at the knee joints greatly influence the results.

Scoring:

The distance in front of or beyond the edge of the platform that can be sustained was measured and recorded. Measurements in front of the platform were negative where as those beyond were positive.

Wells,K.F & Dillon, E.k (1952).

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Statistical Technique

No attempt was made to equate the groups in any manner. Hence, to make adjustments for difference in the initial means and test the adjusted posttest means for significant differences, the analysis of covariance (ANCOVA) was used (Broota, 1989). The scheffe's test was used as post-hoc test to determine which of the paired means differed significantly where the differences in adjusted posttest means resided in univariate ANCOVA among three groups. All of the statistical analysis tests were computed at 0.05 level of significance ($P<0.05$).

Justifications for Using One-Way ANCOVA and Assumptions for ANCOVA

One-way univariate analysis of covariance (ANCOVA) was used to determine how each dependent variable was influenced by independent variables while controlling for a covariate (pre-test) (Hair, Anderson, Tatham, & Black, 1998). Analysis of covariance adjusts the mean of each dependent variable to what they would be if all groups started out equally on the covariate. In this study, pretest scores of selected variables have been shown to correlate with the posttest scores, thus they were considered as appropriate covariates.

A preliminary analysis was conducted to determine whether the prerequisite assumptions of ANCOVA were met before preceding the univariate analysis. Thus, the assumption of equality of variance (homogeneity) and the homogeneity of regression slopes were examined.

Levene's test of equality of error variances on selected variables was calculated and presented in table

TABLE II
LEVENE'S TEST OF EQUALITY OF ERROR VARIANCES ON SELECTED
VARIABLES AMONG GROUPS

Variables	F- Ratio	df 1	df2	Sig.
Speed	8.996	2	42	0.001
Agility	8.981	2	41	0.004

Flexbilty	8.891	2	42	0.002
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(The table value required for 0.05 level of significance with df 2 & 42 is 3.22).

Homogeneity of variances is a term that is used to indicate that groups have the similar variances. Thus, in levene's test of equality of error variances table, the obtained F-values of the selected dependent variables were lesser than the critical value of 0.05, indicates that the variance of each group was not significantly different from one another.

Therefore, the homogeneity of variance of comparing the three groups regardless of the ability level for each of the dependent variables indicated that homogeneity of variance has been met for all the six dependent variables.' Hence it was concluded that the assumption of homogeneity of variance has been met for computing univariate ANCOVA.

The test of significance of the regression of post test (dependent variable) on pre test (covariate) were analysed and presented in table III.

After determining the assumptions for computing ANCOVA have been met with the pre data analysis, the univariate ANCOVA statistical output was examined. Then, providing the ANCOVA result was statistically significant, the univariate results were examined for each dependent variable. For the significant univariate results, the post hoc comparisons were performed to identify where the differences resided. The pair wise comparisons statistics was used for the post hoc results. The results of the descriptive analysis, univariate tests, and the pair wise comparisons among the six dependent variables were reported in chapter four.

Chapter - 4

Chapter IV

RESULTS AND DISCUSSIONS

4.1. OVER VIEW

The subjects for this study were selected at random but the groups were not equated in relation to the factors that have been examined. Hence, the difference among the means of the four groups in the pre-test had to be into account during the analysis of the post test difference among the means. This was achieved the application of analysis of covariance (ANCOVA) where the final means were adjusted for difference in the initial means were tested for significance. When the adjusted post test means were significant, the scheffe's post hoc test was administered to final out the paired means significant difference.

4.2. TEST OF SIGNIFICANCE

This is the crucial portion of the discussion in arriving at the conclusion by examining the hypothesis. The procedure of testing the hypothesis is in accordance with the result obtained in relation the level of confidence, which was fixed at .05 levels and considered necessary for this study. These tests are usually called the test of significance.

4.3. COMPUTATION OF ANALYSIS OF COVARIANCE AND POST HOC TEST.

The following tables illustrate the statistical results of effects due to Silambattam and kalari training on selected motor fitness components among school boys. The analysis of covariance on leg strength of the pre and post test scores of martial arts, Silambattam, kalari training and control groups have been analyzed and presented in Table IV.

Testing of Hypothesis - I

There would be significant improvement on selected dependent variables due to the effects of Silambattam training programme. Table IV presents pre and post test means, standard deviations, and adjusted post test means of each dependent variable by the experimental and control groups

Summary of Testing Hypothesis - I

The statistical results confirmed the hypothesis, showing that there was a significant improvement due to the effects of Silambattam training on selected dependent variables such as Leg Strength.

To examine if there were statistically significant improvement in dependent variables of Silambattam training, and control groups separately, paired sample t-test was conducted.

Table V presents the results of the paired sample t-test of one dependent variables (Leg Strength).

Testing Hypothesis II

There would be significant differences on selected dependent variables among the experimental and control groups. To examine if there were statistically significant differences of dependent variables adjusted mean scores between the Silambattam training and the control groups. While controlling the pretest data, one way univariate analysis of covariance (one-way ANCOVA) was conducted.

Table VI presents the results of the univariate ANCOVA tests of one dependent variables (Leg Strength).

Summary of testing Hypothesis - II

The statistical results confirmed the hypothesis, showing that there was a significant difference among Silambattam training and control groups on selected dependent variables such as Leg Strength.

. SPEED

The analysis of covariance on speed of the pre and post test scores of silambam, kalari training and control groups have been analyzed and presented in Table 4.1.

TABLE – 4.1

**COMPUTATION OF ANALYSIS OF CO-VARIANCE OF PRE TEST, POST TEST AND
ADJUSTED POST TEST ON SPEED OF MARTIAL ARTS, SILAMBAM, KALARI
TRAININGS AND CONTROL GROUPS**

Test	Silambam Group	Kalari Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test								
Mean	8.51	8.58	8.53	Between	0.05	2	0.016	0.30
S.D.	0.25	0.25	0.25	Within	2.89	56	0.052	
Post Test								
Mean	7.27	7.51	8.51	Between	0.52	2	0.174	7.25*
S.D.	0.08	0.08	0.23	Within	1.35	56	0.024	
Adjusted Post Test								
Mean	7.28	7.50	8.51	Between	0.53	2	0.176	15.32*
				Within	0.63	55	0.011	

(The table values required for significance at .05 level of confidence for 2 and 57 and 3 and 56 are 3.16 and 3.17 respectively).

The table 4.1 shows that the pre-test mean values on speed of, silambam, kalari training and control groups are 8.51, 8.58 and 8.53 respectively. The obtained ‘F’ ratio of 0.30 for pre-test scores is less than the table value of 3.16 for df 2 and 56 required for significance at .05 level of confidence on speed. The post-test mean values on speed of, silambam, kalari training and control groups are 7.27, 7.51 and 8.51 respectively. The obtained “F” ratio of 7.25 for post-test scores is higher than the table value of 3.17 for df 2 and 56 required for significance at .05 level of confidence on speed.

The adjusted post-test means on speed of, silambam, kalari training and control groups are 7.28, 7.50 and 8.51 respectively. The obtained “F” ratio of 15.32 for adjusted post-test means is higher than the table value of 3.17 for df 2 and 56 required for significance at .05 level of confidence on speed.

The results of the study indicated that there was a significant difference between the adjusted post-test means of silambam, kalari training and control groups on speed.

Since, three groups were compared, whenever they obtained ‘F’ ratio for adjusted post test was found to be significant, the Scheffe’s test finds out the paired mean differences and it is presented in Table 4.1a.

TABLE 4.1a
THE ORDERED SCHEFFE'S TEST FOR THE DIFFERENCES
BETWEEN PAIRED MEANS ON SPEED

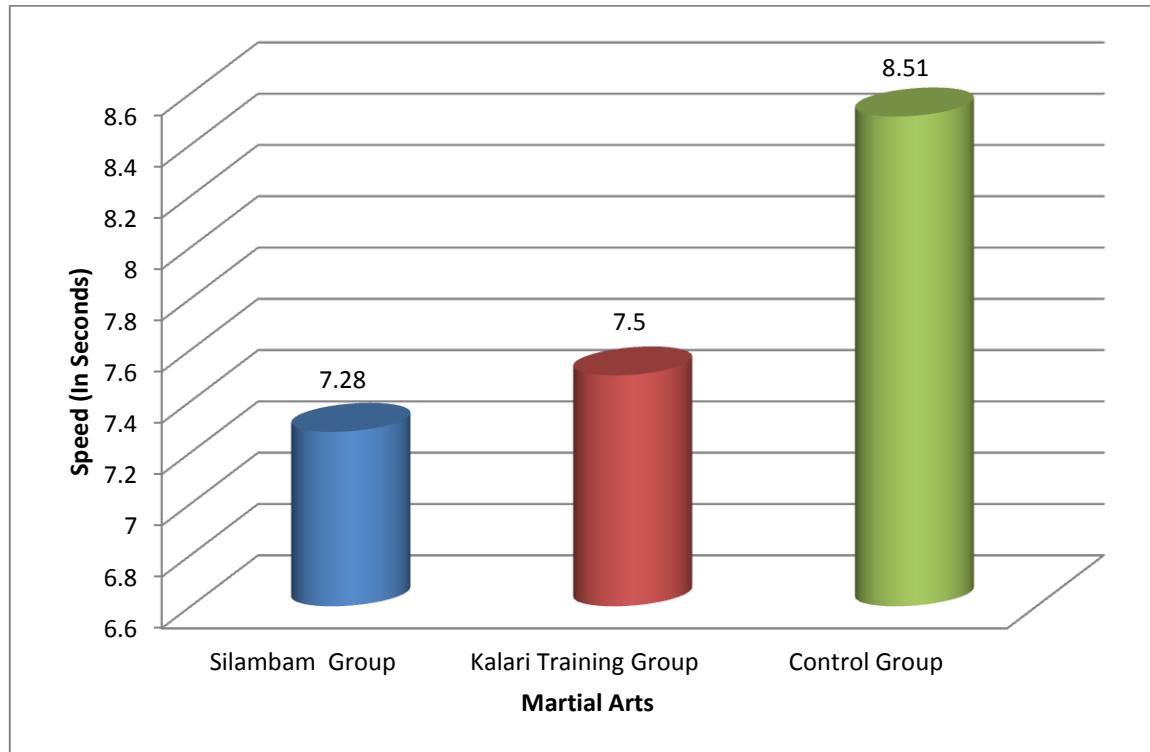
Silambam	Kalari Training	Control	Mean	Confidence
Group	Group	Group	Differences	Interval Value
7.28	7.50	-	0.22*	0.14
7.28	-	8.51	1.23*	0.14
-	7.50	8.51	1.01*	0.14

* Significant at .05 level of confidence.

The table 4.1a shows that the mean difference values between silambam group and control group and kalari training group and control group 1.23 and 1.01 respectively on speed were greater than required confidence interval value 0.14 at .05 level of confidence. Hence, the above comparisons were significant.

Further the table 4.1a shows that the mean difference values between silambam group and kalari training group is 0.22 on speed were greater than required confidence interval value 0.14 at .05 level of confidence. Hence, the above comparisons were significant. The Mean value of silambam (7.25) and Kalari group(7.58) reveals that Silambam group shows better performance than Kalari group.

The adjusted post-test mean values of silambam, kalari training and control groups on speed were graphically represented in figure 4.1.



**FIGURE 4.1: THE ADJUSTED POST-TEST MEAN VALUES OF SILAMBAM,
KALARI TRAINING AND CONTROL GROUPS ON SPEED**

4.3.2. AGILITY

The analysis of co-variance on agility of the pre and post test scores of silambam, kalari training and control groups have been analyzed and presented in Table 4.2.

TABLE – 4.2

**COMPUTATION OF ANALYSIS OF CO-VARIANCE OF PRE TEST, POST TEST AND
ADJUSTED POST TEST ON AGILITY OF, SILAMBAM, KALARI TRAININGS AND
CONTROL GROUPS**

Test	Silambam Group	Kalari Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test								
Mean	17.85	17.87	17.84	Between	0.02	3	0.0056	0.89
S.D.	0.06	0.11	0.06	Within	0.35	56	0.0063	
Post Test								
Mean	14.68	17.73	17.83	Between	0.17	3	0.0573	8.19*
S.D.	0.08	0.10	0.08	Within	0.39	56	0.0070	
Adjusted Post Test								
Mean	14.68	14.71	17.83	Between	0.19	3	0.0624	13.74*
				Within	0.25	55	0.0045	

(The table values required for significance at .05 level of confidence for 2 and 57 and 3 and 56 are 3.16 and 3.17 respectively).

The table 4.2 shows that the pre-test mean values on agility of, silambam, kalari training and control groups are 17.85,17.87 and 17.84 respectively. The obtained 'F' ratio of 0.89 for

pre-test scores is less than the table value of 3.16 for df 2 and 56 required for significance at .05 level of confidence on agility. The post-test mean values on agility of, silambam, kalari training and control groups are 14.68, 14.71 and 17.83 respectively. The obtained “F” ratio of 8.19 for post-test scores is higher than the table value of 3.16 for df 2 and 56 required for significance at .05 level of confidence on agility.

The adjusted post-test means on agility of silambam, kalari training and control groups are 14.68, 14.71 and 17.83 respectively. The obtained “F” ratio of 13.74 for adjusted post-test means is higher than the table value of 3.17 for df 2 and 56 required for significance at .05 level of confidence on agility.

The results of the study indicated that there was a significant difference between the adjusted post-test means of silambam, kalari training and control groups on agility.

Since, three groups were compared, whenever the obtained ‘F’ ratio for adjusted post test was found to be significant, the Scheffe’s test finds out the paired mean differences and it was presented in Table 4.2a.

TABLE 4.2a
THE ORDERED SCHEFFE’S TEST FOR THE DIFFERENCES
BETWEEN PAIRED MEANS ON AGILITY

Silambam	Kalari Training	Control	Mean	Confidence Interval
Group	Group	Group	Differences	Value
14.68	14.71	-	0.03	0.09

14.68	-	17.83	3.15*	0.09
-	14.71	17.83	3.12*	0.09

* Significant at .05 level of confidence.

The table 4.2a shows that the mean difference values between silambam group and control group and kalari training group and control group 0.03, 3.15 and 3.12 respectively on Agility were equal and greater than required confidence interval value 0.09 at .05 level of confidence. Hence, the above comparisons were significant.

Further the table 4.2a shows that the mean difference values between kalari silambam training group and kalari training group is 0.03 on speed were lesser than required confidence interval value 0.09 at .05 level of confidence. Hence, the above comparisons were not significant. and to the silambam and Kalari group show the equal performance on agility test.

The adjusted post-test mean values of silambam, kalari training and control groups on agility were graphically represented in figure 4.2.

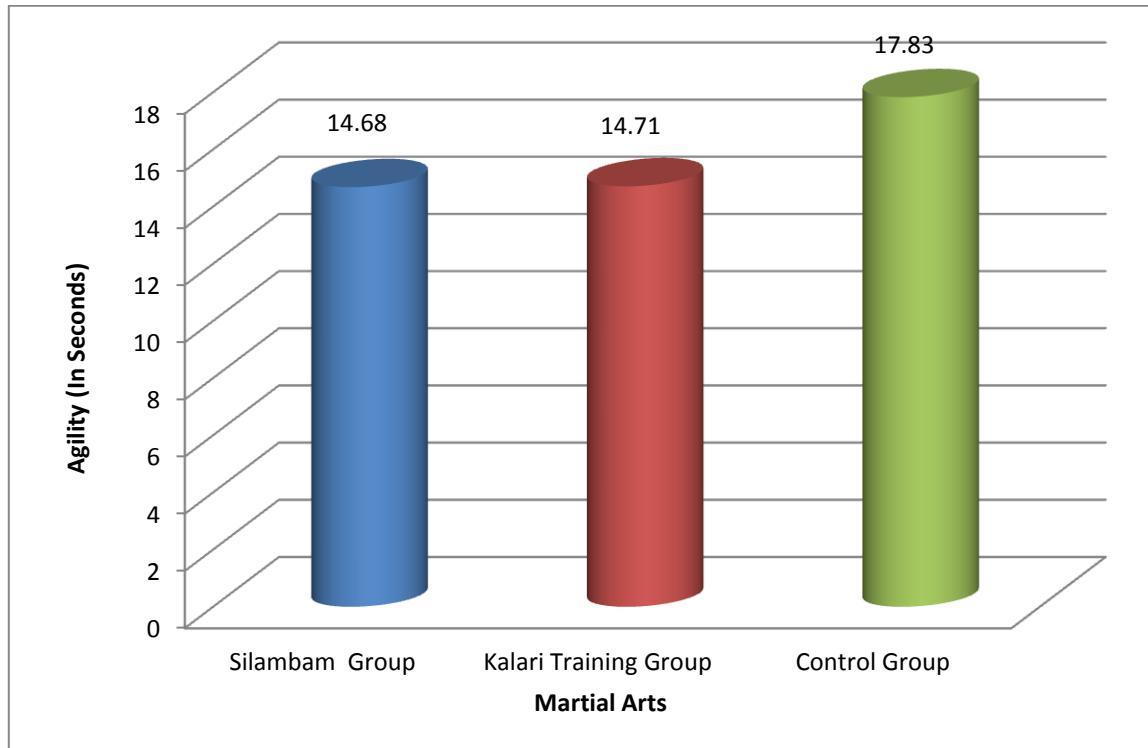


FIGURE 4.2: THE ADJUSTED POST-TEST MEAN VALUES OF, SILAMBAM, KALARI TRAINING AND CONTROL GROUPS ON AGILITY

4.3.3. FLEXIBILITY

The analysis of co-variance on flexibility of the pre and post test scores of silambam, kalari training and control groups have been analyzed and presented in Table 4.3.

TABLE -4.3

**COMPUTATION OF ANALYSIS OF CO-VARIANCE OF PRE TEST, POST TEST AND
ADJUSTED POST TEST ON FLEXIBILITY OF, SILAMBAM, KALARI TRAININGS
AND CONTROL GROUPS**

Test	Silambam Group	Kalari Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	Obtained 'F' Ratio
Pre Test								
Mean	26.81	26.73	17.07	Between	0.9833	3	0.3278	0.29
S.D.	1.08	0.88	1.16	Within	62.6667	56	1.1190	
Post Test								
Mean	39.67	42.67	27.20	Between	255.266	3	85.088	64.86*
S.D.	1.45	0.98	1.08	Within	73.4667	56	1.3119	
Adjusted Post Test								
Mean	39.71	42.77	27.01	Between	270.555	3	90.185	197.79*
				Within	25.0783	55	0.4560	

(The table values required for significance at .05 level of confidence for 2 and 57 and 3 and 56 are 3.16 and 3.17 respectively).

The table 4.3 shows that the pre-test mean values on flexibility of silambam, kalari training and control groups are 26.81, 26.73 and 27.07 respectively. The obtained ‘F’ ratio of 0.29 for pre-test scores is less than the table value of 3.16 for df 2 and 56 required for significance at .05 level of confidence on flexibility. The post-test mean values on flexibility of silambam, kalari training and control groups are 39.67, 26.67 and 27.20 respectively. The obtained “F” ratio of 64.86 for post-test scores is higher than the table value of 2.776 for df 3 and 56 required for significance at .05 level of confidence on flexibility.

The adjusted post-test means on flexibility of silambam, kalari training and control groups are 39.71, 42.77 and 27.01 respectively. The obtained “F” ratio of 197.79 for adjusted post-test means is higher than the table value of 3.17 for df 2 and 56 required for significance at .05 level of confidence on flexibility.

The results of the study indicated that there was a significant difference between the adjusted post-test means of, silambam, kalari training and control groups on flexibility.

Since, three groups were compared, whenever the obtained ‘F’ ratio for adjusted post test was found to be significant, the Scheffe’s test finds out the paired mean differences and it is presented in Table 4.3a.

TABLE 4.3a
THE ORDERED SCHEFFE'S TEST FOR THE DIFFERENCES
BETWEEN PAIRED MEANS ON FLEXIBILITY

Silambam	Kalari Training	Control	Mean	Confidence Interval
Group	Group	Group	Differences	Value
39.71	41.77	-	3.06*	0.87
39.71	-	27.01	12.70*	0.87
-	49.77	27.01	15.76*	0.87

* Significant at .05 level of confidence.

The table 4.3a shows that the mean difference values between silambam group and kalari training group, silambam group and control group and kalari training group and control group 3.06,12.70 and 15.76 respectively on flexibility which were greater than required confidence interval value 0.87 at .05 level of confidence. Hence, the above comparisons were significant.

Further the table 4.3a shows that the mean difference values between silambam group and kalari training group is 3.06 on flexibility were greater than required confidence interval value 0.8 at .05 level of confidence. Hence, the above comparisons were significant. The Mean value of Silambam (39.71) and Kalari group(41.77) reveals that Kalari training group shows better performance than Silambam training group

The adjusted post-test mean values of silambam, kalari training and control groups on flexibility were graphically represented in figure 4.3.

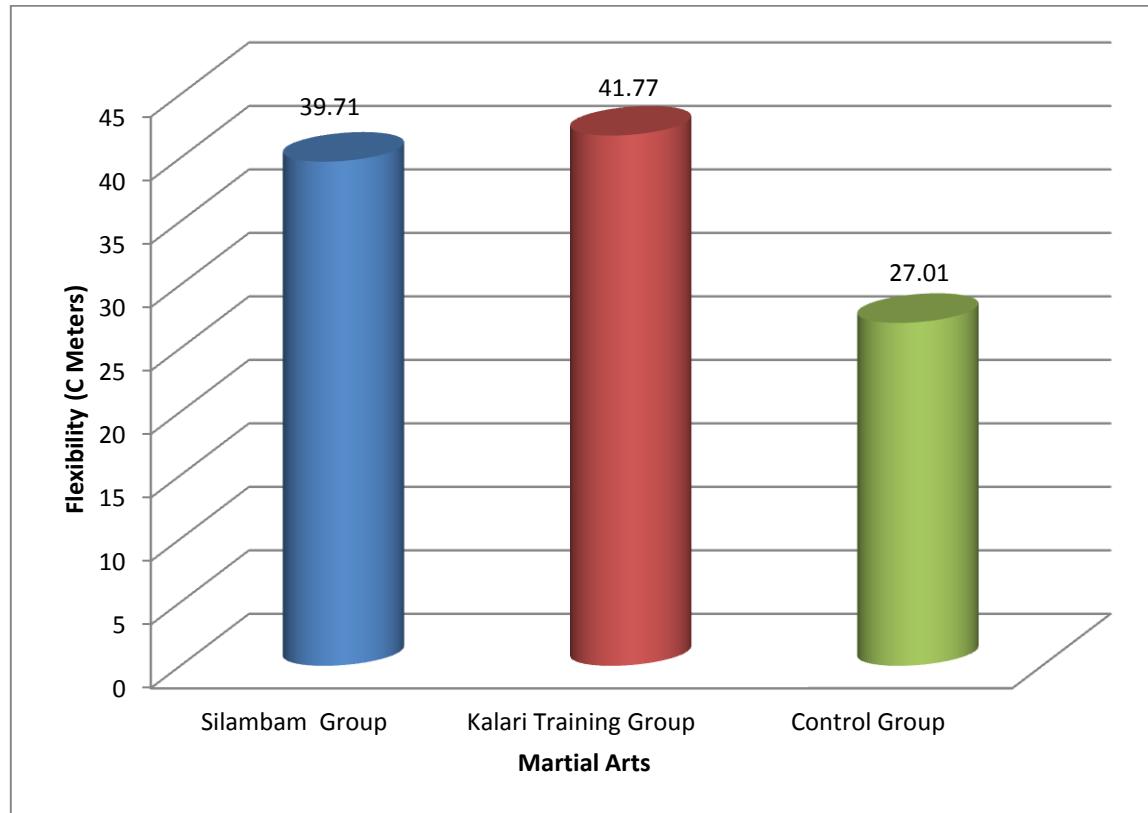


FIGURE 4.3: THE ADJUSTED POST-TEST MEAN VALUES OF MARTIAL ARTS-SILAMBAM, KALARI TRAINING AND CONTROL GROUPS ON FLEXIBILITY

4.4. RESULTS OF THE STUDY

There was a significant difference among silambam, kalari training and control groups on selected motor fitness variables such as Speed, Agility, Flexibility, there was a significant improvement on selected motor ability components such as Speed, Agility, Flexibility, due to, silambam and kalari trainings..

4.5. DISCUSSION ON FINDINGS

In the present study, among the Motor Fitness variables studied, it was found to be significantly correlated with Silambam and kalari playing ability. Among the motor fitness

variables studied was found is the best predictor for silambam and kalari playing ability with significant correlation motor fitness characteristics can influence the effectiveness of such responses, as has been observed in other sports .In this thesis presented the result referent to the motor fitness characteristics contributing to the overall playing ability in terms of predictive equation. Speed, Agility, Flexibilty, was found to be significantly correlated with Silambam and kalari playing ability. In the study, significantly greater body weight among Silambam and kalari might be disadvantageous for them in attaining a good jumping height as they have to lift a greater weight. Among the Physical variables studied co-ordination and agility was found to be significantly correlated with silambam and kalari playing ability

The results of the study showed that there was a significant difference among silambam and kalari training and control groups on selected motor fitness components such as Speed, Agility, Flexibility And significant improvements were noticed on selected motor fitness components such as Speed, Agility, Flexibility due to silambam and kalari trainings.

There is no statistical significance difference between experimental and control group's Pretest scores of **Speed** for motor fitness training. After Silambam and Kalari training, there is a statistical significance difference between experimental and control group's post test scores of speed. Here, Experimental group post test scores were lesser than the control group post test scores. So, the trainings are effective. For concerning with control group, there is no statistical significance difference between pre and post scores. For concerning with experimental group, there is a statistical significance difference between Silambam training group and Kalari training group. Here, the Silambam group test scores are lesser than the Kalari group test socres. Hence,

Silambam group performance is higher than the Kalari group performance. It concluded that, for speed improvement, Silambam training is better than Kalari training.

There is no statistical significance difference between experimental and control group's pretest scores of **Agility** for motor fitness training. After Silambam and Kalari training, there is a statistical significance difference between experimental and control group post test scores of agility. Here, Experimental group post test scores were greater than the control group post test scores. So, the trainings are effective. For concerning with control group, there is no statistical significance difference between pre and post scores. For concerning with experimental group, there is no statistical significance difference between Silambam training group and Kalari training group. Here, the Silambam group test scores are equal to the Kalari group test scores. Hence, It concluded that, for agility improvement, both Silambam and Kalari trainings are effective .

There is no statistical significance difference between experimental and control group's Pretest scores of **Flexibility** for motor fitness training. After Silambam and Kalari training, there is a statistical significance difference between experimental and control group's post test scores of Flexibility. Here, Experimental group post test scores were greater than the control group post test scores. So, the trainings are effective. For concerning with control group, there is no statistical significance difference between pre and post scores. For concerning with experimental group, there is a statistical significance difference between Silambam training group and Kalari training group. Here, the Silambam group test scores are lesser than the Kalari group test scores. Hence, Kalari group performance is higher than the Silambam group performance. It concluded that, for flexibility improvement, Kalari training is better than Silambam training

Chapter 5

apter 5



CHAPTER - V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

One of the most exciting and rewarding aspects of life is perhaps the experience of going beyond what were thought to be our limitations. We begin to realize that may be our beliefs that impose serious limitations on us are simply pre conceived restrictions and attitudes taught to us by parents, teachers and other during formative years. The field of sports and games is no exception. None of our ancestors would have predicted or even dreamt of the techniques applied, the equipment's used by the present athlete, which are the result of systematic a continuous research. The present study is one of such effort to suggest a method for the improvement of performance.

The purpose of the present study is to find out The purpose of the study is to assess the effect of Silambattam and Kalari Training on the selected Physiological and Psychological variables of Silambattam and Kalari Artist. For the purpose of this study sixty male Silambattam and Kalari Artist as subjects in random method. The sixty Silambattam and Kalari Artist from Govt. Hr. Sec. School, Tirunelveli Town, Tirunelveli, District, Tamilnadu (State) at random and age is ranged between 13 - 15 years. Who knows the basic skills of Silambattam and Kalari Training? Were selected as Silambattam and Kalari Group, Control group. The Artist who participated District level were selected as subjects.

The criterion variable Grip Strength, Shoulder Strength, Leg Strength, Speed, Agility, Flexibility assessed by timings and Psychological tests method.

The Silambattam and Kalari Group was trained with selected Silambattam and Kalari for Six days a week for twelve weeks and another group acted as control group. Each training session lasted for 60 minutes included warming-up and warm down periods. Control group was not involved in any specific training.

Prior to and after the training programme, the subjects were tested for Grip Strength, Shoulder Strength, Leg Strength, Speed, Agility, Flexibility with Pre-test and Post-test data of the two groups were statistically examined separately for significant differences, by applying analysis of covariance, the process by which the pre-test mean differences can be adjusted to the post-test means. Adjusted post means were used to compare and to find out the significant differences between the paired means. Since only two groups were employed, using post hoc test is not used. In all the cases .05 level of confidence was selected to reject the null hypothesis.

CONCLUSIONS

Significant improvement was found on Motor Fitness Components in Grip Strength, Shoulder Strength, Leg Strength, Speed, Agility, Flexibility in the Experimental group due to Silambattam and Kalari Training

RECOMMENDATIONS

The result of the study necessitate to suggest the following recommendations 1. Similar study may be conducted on girls adding more variable

2. Similar study may be conducted for college boys and girls using other variables.
3. Similar study may be conducted to find out relative effects of two independent variables acting on selected dependent variables.
4. Such study can also be undertaken for the other games too.

CHAPTER - V

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SUMMARY

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appendix



MOTOR FITNESS VARIABLES TEST
PLATE NO - 1



Speed
(50mts Run)



Agility
(The illions Agility Run)



Flexibility
(Sit and Reach Test)

MARTIAL ARTS - SILAMBAM
(Poor Silambam (Weapon Training) Aayuthapayruku)

Photograph No.11



MARTIAL ARTS - KALARI EXERCISE
Weapon Training & Meyppayattu Exercises

Photograph No.2

