

CHAPTER III

METHODOLOGY

3.1 INTRODUCTION

This chapter explains about the selection of subjects, experimental design, selection of variables, criterion measures, reliability of the data, orientation of the subject, collection of data, pilot study, training protocol, and statistical procedure used.

3.2 SELECTION OF SUBJECTS

To achieve the purpose of the study the investigator selected the cricket players from different colleges in Theni, Madurai and Dindigul Districts of Tamil Nadu, India. The subjects were explained the purpose and nature of the study and requested to be the volunteer for the study. 200 Cricket players in the age group of 18 to 25 years from various colleges were randomly selected as subjects.

3.3 EXPERIMENTAL DESIGN

The study was formulated as pretest and posttest random group design. In this study four group design was used in which 200 subjects were divided into four equal groups. The experimental Group I (N=50 WT group) underwent Weight Training programme, Experimental Group II (N=50, CT Group) underwent the Circuit Training, Experimental Group III (N=50, IT Group) underwent Interval Strength Training and Group IV acted as control group (N=50, CG) did not participate in any specific training programme but regularly practiced cricket like other groups. Resorting from the review of literature, discussions with the experts, considering the feasibility in the criteria of the study and the relevance of the

variables of the present study, the following physical and performance variables were selected for the research study.

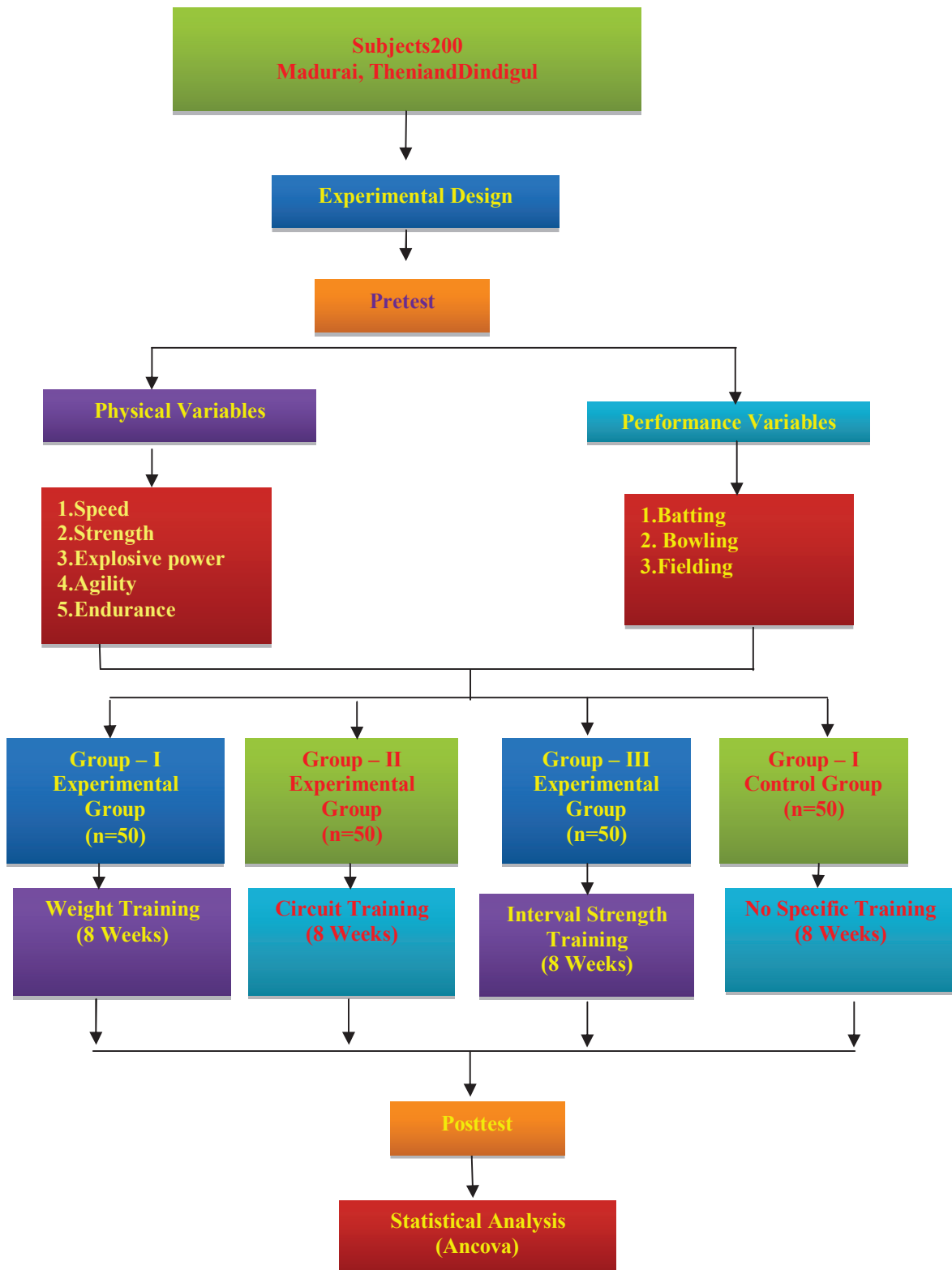


Figure 1 Diagrammatic representation of research study

3.4 SELECTION OF VARIABLES

The investigator reviewed the available scientific literature pertaining to the varied strength Training on selected physical and performance variables from Books, Journal, Periodicals and Research Articles. Resorting from the review of literature and discussions with the experts and considering the feasibility criteria of the study and the relevance of the variables of the present study. The following variables were selected.

3.4.1 Physical Fitness Variables

1. Speed
2. Strength
3. Explosive power
4. Agility
5. Endurance

3.4.2 Cricket Skill Performance Variables

1. Batting
2. Bowling
3. Fielding.

Table I
The Criterion Measures

Variables	Test	Unit
Speed	50mts	Seconds
Strength	Push – ups	Counts
Leg Explosive Power	Standing Board Jump	Meters
Agility	T-Agility	Seconds
Endurance	12 Minutes cooper /run/walk	Meters
Performance Variables	Batting, Bowling and Fielding	Scores

3.5 ORIENTATION OF SUBJECTS

Before the collection of the data, the subjects were oriented about the purpose of the study. The investigator explained the procedure of assessing the physical fitness and skill performances. During a preliminary visit to the fitness center they had been familiarized to all the test protocols. The selected subjects had experienced these testing procedures several times before the commencement of the experiment.

3.6 RELIABILITY OF DATA

The reliability of data was ensured by establishing instrument reliability, tester's competency and subject reliability.

3.7 INSTRUMENT RELIABILITY

With respect to the instruments used in measuring various physical fitness variables certificate of accuracy was obtained from appropriate instrument testing

agency. And, also by recalibrating the scale using known amount of variables wherever required is done prior to the testing.

3.8 TESTER'S RELIABILITY

The assistance of ten specially trained physical education teachers was sought to administer the various test items. They were oriented about the procedures of measuring and recording the scores in each variable. All the assistants were asked to measure on a few subjects and coefficient of intra class correlation of scores recorded by them was taken. The final measuring programme was conducted only on getting high coefficient of correlation.

The obtained values were presented in Table-II. The table shows the very high value of correlations from 0.90 to 0.98 and there by the investigator established competency in conducting the tests as well as the reliability of the instruments.

Table II

Reliability Co-efficient of Test Retest Scores

Sl.no	Variables	Coefficient of Reliability
1.	Speed	0.98
2.	Strength	0.96
3.	Explosive Power	0.95
4.	Agility	0.90
5.	Endurance	0.92
6.	Batting	0.93
7.	Bowling	0.98
8.	Fielding	0.94

$r = 0.55$ significant at 0.05 level

3.9 SUBJECT RELIABILITY

The subject reliability was established by test and retest method using coefficient of correlation for the scores in each of the criterion measures. Re – testing was done within a period of eight weeks in each of the variables to get data for calculating test and re-test coefficient of correlation for reliability of the subjects.

3.10 COLLECTION OF DATA

The subjects were made to perform tests and data which was collected prior and after the study of eight weeks exercise programme.

3.11 PILOT STUDY

A pilot study was conducted to assess the initial capacity of all the subjects in order to fix the intensity and volume of the exercises. To achieve the purpose 40 subjects were randomly selected. The selected subjects were given training package under the direct control of the researcher. Based on the response of the subjects on the pilot study the training schedule was constructed, however the individual difference was considered while constructing the training programme. The basic principles of training (Progression, Over load and Specificity) were followed while giving the training programme.

3.12 TESTING PROTOCOLS

The testing session involved warm up of 10 minutes and stretching before and after the test for 10 minutes. Testing occurred before and after the eight weeks of training regimen. All the tests were conducted in the morning for the testing

purpose. The tester was assisted by ten specially trained physical education teachers to complete the test successfully.

3.13 ADMINISTRATION OF TESTS

Speed

50 mts run.

Purpose

To measure speed.

Equipments

An area on track with a starting line and finishing line with distance of 50mts and two stop watches.

Procedure

After a short warm-up period, the subjects take a position behind the starting line, Best results are distained when two students run at the same time for competition. The starter used the command. "On you marks" and Go along with a clapper and a signal to the timer by a downward snap of the arms. The student run across the finish live only in trail is permitted.

Scoring

The Score is the elapsed time to the nearest 1/100 a second between the starting signal and the instant the subject crosses the finish line.

3.14 STRENGTH (PUSH – UPS)

Objective

To measure the arm strength of the subjects.

Equipment

Stop watches and clapper.

Procedure and Scoring

The number of push – ups completed in 30 seconds was measured with the subject lying face – down with the hands directly under the shoulders, the arms were straightened whilst rest of the body was kept straight. A full push – up was counted when the chest was lowered to touch the ground. (Tyson – 1987)

3.15 LEG EXPLOSIVE POWER

Purpose of the Test

To measure the leg explosive power of the subject.

Instruments and Facilities of the Test

Outdoor long jump, pit, take of board and measuring tape.

Instruction and Precautions Test

Before collection of the data, the subjects, were instructed about the purpose of the study. The investigator explained the procedure of the each item of the motor ability variables such as standing broad, jump for explosive power, subjects had a standard warm up prior to the test.

Test Procedure

The subject was asked to stand on the take of board with his fact parallel to each other from this position the subjects took a preliminary movement by flexing his knees and swinging his arm back. Jumped outward as for as possible. Three trials were permitted in succession, but performance was taken into account

Scoring

The distance of all jumps were measured to the nearest centimeter and the best one was recovered.

3.16 AGILITY TEST (T – TEST)

Objective

To measure the Agility of the subjects.

Equipment

Stop watches and clapper and core

Procedure and Scoring

Set and four cones are placed above 5 yards = 4.57m, 10yards = 9.14). The subject starts at cone a on the command of the timer. The subject sprints to the B and touches the base of the cone with their right hand. They, then turn left and shuffle sideways to cone C, and also touch its base, this time their left hand. Then shuffling sideways to the right to cone D and touching the base with the right had. They then shuffle back to cone B touching with the left hand and run backwards to cone A. The stop watch was stopped as they par Cone A. the stop watch was stopped as they

parCone A. The trial will not be counted if the subject crosses one front be in front of the other while shuffling, fails to touch the base of the over or fails to face forward. Take the best time of three successful trials to the nearest 0.1 seconds. The table, below shows some scores for adult team sports athletes.

3.17 ENDURANCE: (12 MINUTES COOPER RUN / WALK TEST)

Purpose

To measure cardio respiratory endurance.

Facilities, Equipment and Materials

It was suggested that a specific course be measured in distance so that the number of laps completed can be counted and multiplied by the course distance. It was also helpful to divide to course into quarters of eights by placing markers. This enables to quickly determine the exact distance covered in 12 minutes.

Procedure

It was usually most efficient to assign each runner to a spotter. The runners start behind a line and upon the starting signal, run as many laps as possible around the course with in 12 minutes. The spotters maintain a count of each lap and when the signal to strip was given, they immediately run to the spot at which their runners were at the instant the whistle or command to stop was given.

Scoring

The score in meter was determined by multiplying the numbers of complete laps times the distance of each laps (Ex 400 mts) plus the number of segments quarters, eights, 10 meters intervals etc, of on incomplete lap plus the number of meters stepped of between particular segment.

3.18 PERFORMANCE VARIABLE (CRICKET PLAYING ABILITY)

Objective

To assess the cricket playing ability of the subject.

Facilities and Equipment

Cricket ground and all cricket equipments like bat, ball, stumps, pads, cones, guards, gloves etcetera.

3.18.1 Batting

One's batting ability can be best judged by the following factions namely ability to time the ball. Place the ball and to middle the ball with the bat foot work and ability to defend as well as to attack with wide range of strokes and improvisation one other important factions he in batting.

3.18.2 Bowling

One's bowling level can be judged by field work. His ability to spin / cut / swing the ball. Accuracy in line and good length, with wide range of variation in deliveries with good nip, make the bowler more effective

3.18.3 Fielding and Wicket Keeping

Consistency in catching stumping one vital in fielding / wicket keeping Accuracy and speed of throw in the game situation add to ability of the fielder. The consistency and precision in collecting the ball both on the leg side. The ability for stumping and collecting sharp catches behind the wicket indicate the ability of a wicket keeper.

Scoring

Five trained cricket coaches were acted as judges to evaluate the subjects' cricket playing ability and they recorded the performance of the subject during the pre and posttests. The investigator provided the guidelines to the coaches for the subjective rating of the performance on batting, bowling, wicket keeping or fielding and the scores ranged from 1 to 10. The highest and lowest scores were not taken and the average of the remaining three scores was recorded as the individual's cricket playing performance score.

3.19 TRAINING PROTOCOL

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

The training programme for each session lasted for sixty minutes totally including first ten minutes warm – up with dynamic stretching exercises and last ten minutes warm down with static stretching exercises which was ensured that the training intervention could be monitored and medical assistance was directly reliable and accessible during the training sessions in case of injury. A fully equipped and

stuffed first – aid station was also available within the campus that nearly the training venue. After the initial measurements and before the initiation of the training periods the subjects of all groups were instructed about the proper execution of all the exercises to be used during the training for all the three training regimens. After eight weeks of training the post test was conducted.

The subject underwent their respective training programme as per the schedule under the supervision of the investigator. Experimental Group I underwent weight training, Experimental Group G II underwent circuit training, Experimental Group III underwent interval strength training Group IV kept as control without underwent any training programme.

Table III

Weight Training Schedule

Group	Weeks	Intensity	Repetition	Set	Recovery between exercise/sets
Weight training	1-2	60%	12	3	30sec/3min
	3-4	70%	10	3	45sec/3min
	5-6	80%	8	3	60sec/5min
	7-8	90%	6	3	90sec/5min

Weight Training Exercises

1. Shoulder press
2. Bench press
3. Squats
4. Leg press
5. Biceps
6. Triceps

Table IV
Circuit Training Schedule

Group	Weeks	Repetition	Rest between each stations	Circuits	Recovery between circuits
Circuit training	1-2	12	10sec	3	90sec
	3-4	16	15sec	3	90sec
	5-6	20	20sec	3	90sec
	7-8	24	30sec	3	90sec

Circuit Training Exercises

1. Squats
2. Step – up
3. Push – ups
4. Lat pull down
5. Leg Extensions
6. Pull – ups

Table V
Interval Strength Training Schedule

Group	Weeks	Intensity	Repetition	Set	Recovery between exercise/sets
Weight training	1-2	75%	12	3	30sec/2min
	3-4	80%	10	3	30sec/2min
	5-6	85%	8	3	60sec/4min
	7-8	90%	6	3	60sec/4min

Interval Strength Training Exercises

1. All Body
2. Bench press
3. Squat
4. Leg press
5. Dumbbells (Biceps)
6. Dumbbells (Triceps)

3.20 WEIGHT TRAINING PROGRAMME

Shoulder Press: This exercise was performed on a seated position of an adjustable inclined bench kept as supporting the back. Asked to lift the weights from the shoulders up above their head keeping the plans facing forward the whole time. This exercise was done with the use of an adjustable incline.

Bench Press : This exercise was done with a spotter slowly asked to lower the weight towards the chest. Then paused without touching the chest, then pushed lock. The subjects were instructed to stop before locking elbows at the top. Asked to perform with a wide grip which work on the pectoral (chest) muscles.

Squats: The exercise was performed in sate way through a power rack machine. The bar and weight was set to the subject depended. Positioned themselves on to the rack and the barbell resting at their back within the shoulders. The subject was asked to bend the tines slowly with a proper posture of having a straight back with the butt out. Asked to keep balance and go as low as until their things looked parallel to the floor (sitting on chair like, keeping spire neutral. The hips should be

below. The knees, asked to rise back by using thigh power and back to the starting position and repeated.

Leg Press: was a great multi – jointed exercise for the legs that can be used in conjunction with the squat or as a substitute for it in cases where lower back injuries may prevent squat execution. Because of the fact that your body is stationary inside of the machine simply pressing a sled. Neuromuscular stimulation is not nearly as high as that of the squat but it still makes for a great kg exercise.

Biceps Exercise: from standing position Holding the bar bell in both the hands and raising the hands in the shoulder level by bending the elbows.

Triceps Exercise: from standing position keeping the Bar bell above the head and lowering the barbell back of the neck by flexing the elbow and back to position.

3.21 CIRCUIT TRAINING PROGRAMME

Squats: The subject was asked to bend the knees slowly with a proper posture of having a straight back with the butt out. Asked to keep balance and go as low as until their thighs looked parallel to the floor (sitting on chair like). The hips should be below the knee asked to rise back by using high power.

Step – up: Running on the steps for 45 seconds with weights.

Push –ups – Subject lying face – down with the hands directly under the shoulders, the arms were straightened whilst rest of the body was kept straightened whilst rest of the body was kept straight.

Lat pull down: This exercise was performed in the machine where the subjects were asked to sit in the machine and to hold the bar handed above the head at a wide group method. The bar should be pulled towards front of the body until the lower chest level and slowly asked to go back to the starting position elbows should not be locked.

Leg Extensions: This exercise was done by using a machine on a leg extension bench machine. The subjects were asked to position their legs under the bar pads for support and asked to hold on to both side of their seat. Then extended or lifted their legs as to contraction on their things without locking the knee joint and repeated up to seconds.

Pull – ups: From the hanging position of the Horizontal bar the Individual has to raise his body with chin touches the bar and coming back to the hanging position as much possible.

3.22 INTERVAL STRENGTH TRAINING PROGRAMME

All Body – Keeping the legs with shoulder with slightly flexed the knees lift the barbell from the ground slowly rise it above the head and lower the bar bell back.

Bench Press: This exercise was done with a spotter slowly asked to lower the weight towards the chest. Then paused without touching the chest, and then pushed lock. The subjects were instructed to stop before locking elbows at the top. Asked to perform with a wide grip which works on the pectoral (chest) muscles.

Squat: The exercise was performed in safe way through a power rack machine the bar and weight was set to the subject depended positioned themselves on to rack and

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Biceps – Exercise: from standing position holding the Bar-bell in both the hands and raising the hands in the shoulder level by bending the elbows.

Triceps – Exercise: from standing position keeping the Bar-bell above the head and lowering the barbell back of the neck by flexing the elbow and back to position.

3.23 STATISTICAL ANALYSIS OF DATA

In the present study, the data were analyzed by using (SPSS) the statistical procedure analysis of covariance (ANCOVA) to compare the significance of the mean difference among the four groups on the physical fitness and performance variables. When the F-ratio was significant Scheffe's post hoc test was used to find out which treatment used in the present study is the source for the significance on adjusted posttest means. The level of significance was fixed as 0.05 level.