CHAPTER III
METHODOLOGY

This study explored how high-intensity interval training, aerobic training, and a concurrent of both influence selected skill-related, physical and physiological performance factors in intercollegiate male football players. The research was structured following a detailed review of existing literature, which helped in framing the methodological approach. This methodology then became the basis for the research, offering a clear roadmap for designing and conducting each step of the study.

The chapter focused on a number of items that were most important to the research undertaking. It explained how subjects were chosen, explicated the primary variables being of observation, and declared the experimental design employed in the research study. It also provided space for a pilot study to test the methodology. Due care was exercised in criterion measure selection, and measures were taken to affirm the reliability of instruments, data, and test procedures. The chapter also described the way in which reliability of both the testers and subjects was guaranteed throughout the training as well as the assessment time. Specific details about the implementation of HIIT, aerobic training, and their co-administration to ensure consistency in training protocols were given. Statistical techniques utilized in data analysis, administration of tests, training calendar, and data collection are also explained in this chapter along with the reason for their selection.

3.1 SELECTION OF SUBJECT

A random sample of 100 male Inter collegiate football players was picked from the colleges affiliated to the G.T.N Group of Institutions in Dindigul for this research. Participants enrolled for this research were between 18 and 21 years of age. The entire 100 participants were divided into four groups equally with 25 members in each group. Group I was administered to high-intensity interval training, Group II had a planned regime of aerobic training. Group III had a mixed training regime consisting of both HIIT and aerobic training done simultaneously. Group IV served as the control group, receiving no instruction at all during the investigation. This classification allowed for a comparison of the impact of various training methods on the performance measures of concern. All of the subjects of the study were considered to be healthy and physically fit. The subjects were

explained properly about the importance and aim of the study before it began, and they agreed to be included voluntarily. Despite being told that they could leave the study at any moment, none of the participants chose to do so.

3.2 SELECTION OF VARIABLES

The researcher intended to measure the influence of HIIT and traditional aerobic training on football players by focusing on a range of dependent variables. These included measures related to physical and physiological performance, such as muscular strength, muscular endurance, speed, power, agility, cardiovascular endurance, heart rate, and VO2 Max. In addition to these, the study also evaluated skill-based performance indicators, specifically passing, kicking, dribbling, and shooting abilities, to provide a comprehensive understanding of how different training modalities influence both fitness and technical skills in football.

Scientific literature, expert opinions, and the researcher's insights guided the variable selection process. Numerous sources, including journals, books, magazines, periodicals and research papers, were included in the this work. The feasibility of the criteria, the instrument's accessibility, and the study's applicability all influenced the final decision. The study aims to analyse significant changes in the chosen variables after twelve weeks of HIIT and aerobic training. The researcher specifically focused on literature related to the college under consideration, G.T.N Group of Institution, Dindigul, ensuring the applicability of findings to the study's context.

3.3 EXPERIMENTAL DESIGN

A total of one hundred players of football were arbitrarily divided into four equal groups as part of a randomized pre-test and post-test research design. All the groups included twenty-five participants. Training with high-intensity intervals was given to Group I, while Group II followed a structured aerobic training program. Group III also took part in HIIT with an aerobic training. However, as the control group, Group IV did not participate in any specialized instruction sessions. The workouts lasted for twelve weeks and were scheduled three times a week. Each participant completed a pre-test prior to training to document baseline performance based on specific physical, physiological, and skill-related criteria; post-test assessments were performed following the completion of the twelve-week program; and the data gathered from the pre- and post-test phases were

statistically analysed to assess the impact of the various training approaches on performance outcomes.

3.4 PILOT STUDY

A trial investigation was carried out to ascertain the appropriate exercise load and verify that the program's duration was appropriate for the patients' capacities. Positive outcomes were ensured by the first research's goal of determining the subjects' baseline physical capacity. Fifteen people were randomly chosen for this pilot. After that, they were split up into three groups, each consisting of five people. HIIT was practiced by Group I. Group II received Aerobic Training (AT). Group III experienced a combination of both HIIT and AT. An experienced investigator, proficient in both high-intensity interval and aerobic exercise methods, guided all these groups. After four weeks of this experimental regimen, the patients completed a post-test. Throughout this pilot phase, the researcher faced several organizational difficulties. The feedback from the subjects in this pilot study was instrumental in shaping the 12-week training schedule for the main trial's experimental groups. The current investigation was carried out on one hundred volunteers following the conclusion of the pilot study. Further the subjects who participated in pilot study were excluded.

3.5 CRITERION MEASURES

The examination items that were chosen to gather data on the chosen performance related to physical, physiological, and skill performance were standardized and best suited for this study after the researcher reviewed a variety of literature and conferred with physical education specialists. These are shown in table 3.1.

Table 3.1

DEPENDENT VARIABLES

SI. NO	Variables	Test	Units of measurement	Author	Year
PHYSICAL VARIABLES					
1	Muscular Strength	Back Squat Repetition Max Test	In Counts	Baechle& Earle	2008
2	Muscular Endurance	Sit-Ups	In Counts	AAHPERD	1980
3	Speed	50m dash	In Second	Mackenzie	2005
4	Power	Kneeling power ball chest launch	In Distance	Johnson, B. L., & Nelson, J. K.	1986
5	Agility	Illinois Agility Test	In Second	Heil et al.	1995
6	Cardiovascular Endurance	Cooper 12-minute Run Test	In Distance	Dr. Kenneth H. Cooper	1968
PHYSIOLOGIVAL VARIABLES					
7	Heart Rate	Short Hand Method	Beats per Minute (BPM)	Aoyagi &Pyon	2002
8	Vo2 Max	Maximal Oxygen Consumption Test	Liters per Minute (L/min)	John Hutchinson	1846
SKILL PERFORMANCE VARIABLES					
9	Passing	Morgan Christian General Soccer Ability Test	In Numbers	Mor& Christian	1979
10	Kicking	Warner Test for soccer Skills	In Scores	Warner	1950
11	Dribbling	Morgan Christian General Soccer Ability Test	In Seconds	Mor& Christian	1979
12	Shooting		In Scores		

3.6 RELIABILITY OF DATA

The test-retest procedure was used to evaluate the data's reliability. Ten individuals were therefore chosen at random and administered the test two times, separated by one day. During testing and retesting, care was made to maintain consistent testing conditions. Intra-class correlation for the various factors was used to correlate the scores obtained by the 10 subjects on the test and retests. Table 3.2 displayed the correlation coefficient.

TABLE- 3.2

RELIABILITY CO-EFFICIENT OF CORRELATION OF TEST-RETEST SCORES

S.No	Variables	Co-efficient of correlation 'r' (N-10)
1	Muscular Strength	0.99*
2	Muscular Endurance	0.98*
3	Speed	0.99*
4	Power	0.99*
5	Agility	0.94*
6	Cardiovascular Endurance	0.90*
7	Heart Rate	0.81*
8	Vo2 Max	0.85*
9	Passing	0.89*
10	Kicking	0.99*
11	Dribbling	0.80*
12	Shooting	0.93*

3.7 RELIABILITY OF INSTRUMENT

The researcher ensured the reliability of instruments used in the study through rigorous measures. Sport stopwatches, measuring tapes, footballs, and other equipment

were procured from reputable companies, calibrated, and verified to be in good working condition. International standards were followed in the calibration testing, which covered devices including digital wristwatches, heart rate monitors, and stopwatches. For further validation, measurements were collected twice and correlated. To evaluate reliability, steel measuring tapes from reputable businesses were subjected to a test-retest procedure in which each variable was recorded three times under comparable circumstances. Additionally, the study involved the use of instruments such as stadiometer, weighing machines, and footballs, and measurements were recorded five times to establish their accuracy and reliability for research purposes.

3.8 TESTER'S RELIABILITY

The investigator explained and showed the assistance testers the testing protocols and scoring techniques. The goal of the study and the data needed were explained in detail. The operation of various equipment was demonstrated, and the precise measurement of dependent variables was emphasized to ensure accuracy. Testers received training to conduct tests error-free.

To ensure proficiency in directing tests, practice sessions were conducted under expert guidance. Both the researcher and assistants, acquainted with the tests and procedures, joined in these sessions. The assessment of the tester's abilities and test reliability was performed during these practice sessions.

The investigator participated in practice sessions on test conduct methodologies and teaching processes to further guarantee tester dependability. The test-retest process was used to confirm the reliability of the testers.

3.9 SUBJECT RELIABILITY

Standardized circumstances, exams, and testers were used to guarantee consistent findings from the same people. Subject dependability was assessed using the test-retest procedure. To remove any doubt, the researcher met with the individuals before the exam was given, thoroughly explaining the goals, importance of the research, and requirements of the testing process. With a clear understanding, the participants voluntarily participated in the training and testing processes with the goal of enhancing their own performance and adding to the scientific study. Throughout the research, the subjects shown cooperation and excitement.

3.10 TRAINING PROGRAMME AND SCHEDULE

The following is a description of the methodology used in the training program for this study. The training programs for HIIT, aerobic training and their concurrent training were designed based on fundamental training principles. Group I followed a HIIT routine on Mondays, Wednesdays, and Fridays throughout the training period. Group II performed aerobic training on the same three days of the week. Group III concurrent high-intensity interval and aerobic training conducted on Mondays, Wednesdays, and Fridays. These three experimental groups trained three times a week for a total of twelve weeks of training. Group IV served as the control and did not participate in any specific training program other than their usual football practice. All training sessions were carried out under the direct supervision of the investigator. Each participant completed their assigned program as per the planned schedule, ensuring consistency and adherence throughout the training period.

TABLE 3.3

GENERAL STRUCTURE OF TRAINING PROGRAM

S. No	Group with Training Particulars	Training
1	Group I	High intensity interval training
2	Group II	Aerobic training
3	Group III	Concurrent training
4	Group IV	Control Group
5	Training Duration	60 Minutes
6	Training Session per week	Weekly 3 days
7	Total Length of Training	12 weeks
8	Training Intensity	Progressive method (simple to complex method)

3.11 HIGH-INTENSITY INTERVAL TRAINING

I proposed a complete program for the experimental group, which practiced HIIT. The duration of this HIIT program was twelve weeks. Football players were engaged in the activity. The training sessions, which were held three times a week, included rounds of intense workouts that alternated and focused on physical, physiological, and skill performance components. These exercises included drills and sport-specific movements

such as passing, kicking, dribbling, and shooting for football players. Progress was tracked by assessing variables such as muscular strength, endurance, speed, power, agility, and cardiovascular endurance; physiological variables like heart rate and VO2 max; as well as skill performance variables. Throughout the training program, all activities were explained and demonstrated to the participants, with an emphasis on technique and safety measures. It is important to note that ethical considerations were followed throughout the study. Participants with health conditions received supervision from healthcare professionals during the training program.

The outcomes of implementing this HIIT program provided knowledge regarding its impact on physical and physiological responses, as well as skill performance, within the designated group.

TABLE 3.4

High Intensity Interval Training Programme for 12 Weeks

HIIT Training Programme									
Week	**No. of exercises**	**Days**	**Load**	**Exercise**	**Counts**	**Rep**	**Rest.in Between rep**	**Set**	**Rest.in between set in minute**
1st to 4th	10	Monday Wednesday Friday	70%	Walking, Running, Stair climbing, Jumping jack & run, 10 yards sprint and jog, Star jump, Stationary jump, Barbee jump, Two count jump, Four count jump	10	3	1 min	3	2
5th to 8th	10	Monday Wednesday Friday	80%	Walking, Running, Stair climbing, Jumping jack & run, 10 yards sprint and jog, Star jump, Stationary jump, Barbee jump, Two count jump, Four count jump	10	4	1min	3	2
9th to 12th	10	Monday Wednesday Friday	90%	Walking, Running, Stair climbing, Jumping jack & run, 10 yards sprint and jog, Star jump, Stationary jump, Barbee jump, Two count jump, Four count jump	10	5	1min	3	2

3.12 AEROBIC TRAINING

The twelve-week plan, which focused on aerobic training, was designed with athletes participating. Aerobic training was done three times a week for up to 60 minutes each session. The program included a variety of aerobic exercises such as dancing, strength training, and cardiovascular exercises. To make sure that participants kept their target heart rate in the aerobic zone, the intensity of the activities was adjusted. A warm-up and cool-down were incorporated into the training to facilitate the process and reduce the chance of injury. Physiological variables, including heart rate and overall cardiovascular endurance, were evaluated periodically to assess the effectiveness of the program. Research scientists provided detailed descriptions and demonstrations of the exercises, emphasizing proper form and technique. Fair judgment was respected, and participants with special circumstances received appropriate care and attention from medical professionals throughout the study period. The results of this aerobic training were intended to provide a deeper understanding of how these impacts affected the body and skills of the athletes.

TABLE 3.5

Aerobic Training Programme for 12 Weeks

Aerobic Training Programme								
Week	**No. of exercises**	**Days**	**Load**	**Exercise**	**Counts**	**Rep**	**Set**	**Rest in between set in minute**
1^{st} to 4^{th}	10	Monday Wednesday Friday	70%	Step touch, Step up, Step down, V-step, C-step, Step up and window, Step side and kick, Step up and lift leg, Step side& swing leg, Step up and clap.	10	3	3	2
5^{th} to 8^{th}	10	Monday Wednesday Friday	80%	Step touch, Step up, Step down, V-step, C-step, Step up and window, Step side and kick, Step up and lift leg, Step side& swing leg, Step up and clap.	10	4	3	2
9^{th} to 12^{th}	10	Monday Wednesday Friday	90%	Step touch, Step up, Step down, V-step, C-step, Step up and window, Step side and kick, Step up and lift leg, Step side& swing leg, Step up and clap.	10	5	3	2

3.13 CONCURRENT HIIT WITH AEROBIC TRAINING PROGRAMME

The twelve-week plan, which focused on concurrent HIIT with aerobic training, was designed with athletes participating. The concurrent HIIT with aerobic training program was conducted three times a week for up to 60 minutes each session. The program included a variety of exercises such as dancing, strength training, and cardiovascular activities. The intensity of the exercises was adjusted to ensure that participants maintained their target heart rate within the concurrent HIIT with aerobic training zone. Training sessions included a warm-up and cool-down period to facilitate the process and reduce the risk of injury. Physiological variables, including heart rate and overall cardiovascular endurance, were evaluated periodically to assess the effectiveness of the program. Research scientists provided detailed descriptions and demonstrations of the exercises, emphasizing proper form and technique. Fair judgment was respected, and participants with special circumstances received appropriate care and attention from medical professionals throughout the study period. The results of this aerobic training were intended to provide enhanced knowledge of how these impacts affected the body and skills of the athletes.

TABLE 3.6

Concurrent HIIT with Aerobic Training Programme for 12 Weeks

Concurrent HIIT with Aerobic Training Programme								
Week	**No. of exercises**	**Days**	**Load**	**Exercise**	**Counts**	**Rep**	**Set**	**Rest in between setin minute**
1^{st}to4^{th}	10	Monday Wednesday Friday	70%	Walking, Running, Stair climbing, Jumping jack & run,10 yards sprint and jog, Step touch, Step up and down, V-step, C-step	10	3	3	2
$5^{th}$to 8^{th}	10	Monday Wednesday Friday	80%	Walking, Running, Stair climbing, Jumping jack & run,10 yards sprint and jog, Step touch, Step up and down, V-step, C-step	10	4	3	2
$9^{th}$to 12^{th}	10	Monday Wednesday Friday	90%	Walking, Running, Stair climbing, Jumping jack & run,10 yards sprint and jog, Step touch, Step up and down, V-step, C-step	10	5	3	2

3.14 TEST ADMINISTRATION

3.14.1 MUSCULAR STRENGTH- BACK SQUAT REPETITION MAX TEST

Purpose:

The goal is to assess the maximum lower body strength of an individual.

Equipment Required:

A barbell along with a range of free weights is used for this assessment.

Procedure:

The participant begins by positioning themselves under the bar, placing their feet shoulder-width apart. It is vital to verify that a proper warm-up is completed beforehand. The alignment of the toes and knees should be straight. With the bar resting on the shoulders, the participant lowers their body in a controlled way by bending at the hips and knees. The spine should remain neutral without rounding, and the head stays upright with the gaze forward. The knees need to reach a 90-degree angle before the drop is complete. From this position, the individual rises back to a standing posture by pushing through the heels. The movement should remain steady, smooth, and uninterrupted throughout.

Scoring:

The highest weight that can be successfully lifted is noted. The score may also be stated in relation to the person's body weight, providing a consistent indicator of lower body strength and ensuring uniformity across all body types.

3.14.2 MUSCULAR ENDURANCE- SIT- UPS

Purpose:

To gauge the abdominal muscles stamina and strength.

Equipment Required:

Mats, stop watch

Procedure:

The individual lay flat on the ground, ensuring that their heels were no more than a foot away from their buttocks, knees bent, feet firmly planted on the floor. The knees were kept at an angle of at least 90 degrees. The fingers were intertwined and behind the neck, but the elbows remained in contact with the floor. A partner held the subject‘s feet securely to provide support and stability during the movement. Curled up in a seated position, the subjects touch their knees and chest.

Scoring:

The most sit-ups performed in 60 seconds determines the score.

3.14.3 SPEED- 50 M DASH

Purpose

To assess Speed

Equipment Used:

Measuring tape, digital stopwatch and starting clapper

Procedure

It was decided to use the standing start. The test score was determined by timing how long it took the runner to cross the finish line after receiving a "clap." The fractions have been rounded to the closest tenth of a second. The best of two trials was noted after they were conducted with adequate rest in between.

Scoring

Speed was recorded in 1/10 second. (Rose Magi, 1967)

3.14.4 POWER- KNEELING POWER BALL CHEST LAUNCH

Purpose:

The goal is to study the strength, power and upper body coordination

Equipment Required:

foam pad for kneeling, 2 or 3 kg power ball, tape measure, clear open area for testing.

Procedure:

The athlete begins by kneeling with their back straight and facing the intended throw direction. At the starting line, the knees and thighs should be aligned parallel to each other. Curling the toes can help with grip, so make sure they're pointed backward. To kick things off, hold the ball up above your head with both hands at your sides. Next, the ball is pushed forward and upward in one smooth motion (ideally at an angle between 30 and 45 degrees) as the hips return to the heels after being dropped to the chest. To understand the proper motions and obtain the optimal trajectory for the greatest distance, a practice trial was provided. They must not rotate around the spine or toss with one arm in favor. After

the ball was released, the athlete was allowed to tumble forward beyond the line. The knees must remain on the ground. With a minimum of 45 seconds of rest in between each shot, two tries were permitted.

Scoring:

From the outermost point of the launch line, the Power Ball's first landing spot was determined and documented in feet and inches, corrected to the nearest inch. The recorded distance was the best result from two throws.

3.14.5 AGILITY- ILLINOIS AGILITY TEST

Purpose:

To assess agility

Equipment:

Stop Watch, Measuring tape, lime powder, flag post, paper and pen.

Description:

Two parallel lines represented a ten-yard distance. Behind the starting line was the subject. She rushed as quickly as she could to the other line as the "Go" signal was given, touched it with one hand, and then ran back to the starting line. He touched it, then did the course shuttle again.

Scoring:

The test score was determined by recording the performer's time to finish the 4x10 yard course to the closest 1/10th of a second (Rose Magi, 1967).

3.14.6 CARDIOVASCULAR ENDURANCE – COOPER 12 MINUTE RUN AND WALK TEST

Purpose:

To test aerobic fitness.

Equipment:

Marker cones, Flat oval or running track, stop watch, recording sheets,

Description:

Place markers along the track at regular intervals to help measure the distance you've covered. After running for 12 minutes, you will want to note the total distance

traveled. Walking is permitted, but participants should be urged to give it their all in order to cover as much ground as they can.

Scoring:

Using the distance you have scored, you can estimate your VO2 max (in ml/kg/min) with a specific formula that applies to either kilometers or miles (Coper, 1968).

VO_{2max} = (35.971 x distance in miles) - 11.288

VO_{2max} = (22.351 x distance in kilometers) - 11.288.

3.14.7 HEART RATE- SHORT HAND METHOD

Purpose

The wrist (radial artery) and neck (carotid artery) are the locations where the palpation method is used to monitor heart rate.

Procedure:

Place the middle and index fingers gently on the inside of the other wrist, about half an inch below the bottom of the thumb, and align them with the index finger to examine the radial pulse. Apply light pressure until the pulse becomes noticeable. To precisely calculate the heart rate, count the beats for a full 60 seconds after the pulse is detected.

Scoring:

One can determine the pace per minute by multiplying the number of seconds by six, counting over thirty seconds and doubling the result, or counting over ten seconds and multiplying by four.

3.14.8 VO2 MAX- MAXIMAL OXYGEN CONSUMPTION TEST

Purpose:

The gold standard for measuring an athlete's aerobic power is the VO2max test.

Procedure:

An ergometer is used for exercise, preferably one that is suitable for the sport or a subject's preferred method of exercise. The exercise demands are chosen so that they increase from moderate to peak intensity in small steps. The maximum level of oxygen

uptake is established at or close to test completion and is computed using ventilation measurements as well as the amount of carbon dioxide and oxygen in the expired air.

Scoring:

Either l/min (liters per minute) or ml/kg/min were used to present the results.

3.14.9 Passing - Morgan Christian General Soccer Ability Test for PASSING

Purpose

To calculate the subjects passing competency.

Two practice trials.

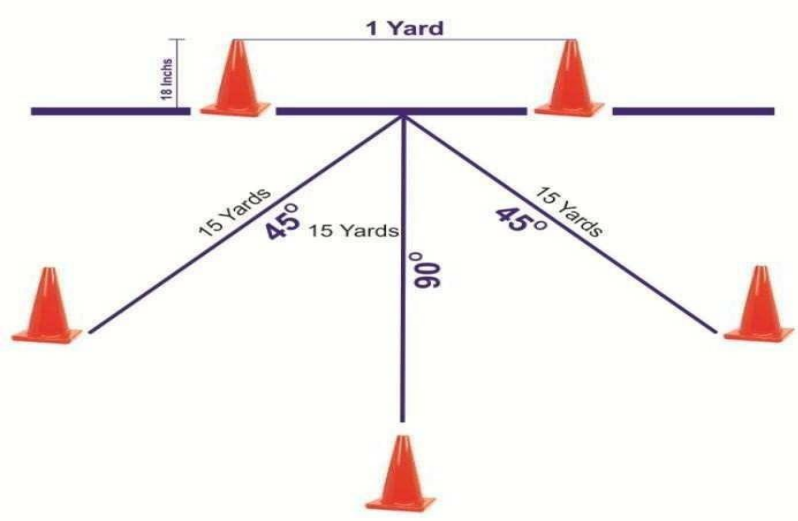

Figure: 3.1 The markings of Morgan Christian General Soccer Ability Test for passing

Field Marking

Two cones were placed one yard apart to form a small goal that was one yard wide and eighteen inches high, with a 4-foot rope serving as the crossbar. One cone was positioned 90 degrees from the goal time, and two cones were positioned 45 degrees from the goal line. The distance between the three cones and the goal was fifteen yards.

Procedure

The respondents used their favorite foot to make four passes into the goal from each of the three cones. Each location was permitted to conduct

Scoring

Every successful pass earned one point. Balls were deemed successful when they struck the goal cones. The sum of the twelve trials was the final score **(Morgan Christian General Soccer Ability Test, 1979** as cited in **YobuA., 2010)**.

3.14.10 KICKING - WARNER TEST FOR SOCCER SKILLS

Purpose:

To measure kicking ability Equipment: Balls, Measuring Tape (100mts).

Field Marking: 25 yards restraining line was drawn with the perpendicular two straight line not less than 80 yards. The two lines were marked from the distance of 25yeards to each 5 yards intervals up to maximum distance Parallel to the restraining line.

Procedure: A stationary ball can be kicked by the player running. The ball needs to land inside a 25-yard-wide lane. It measures how far the ball travels in the air. There are three trails provided.

Scoring: The distance between the initial bounce of the kicked ball on the ground and the restraining line should be measured. To the closest meter, note the best of three measurements.

3.14.11 DRIBBLING- Morgan Christian General Soccer Ability Test for Dribbling

Purpose

To calculate the dribbling ability of the subjects.

Field Marking

A 20-yard-diameter circular circuit was measured and given a label. Twelve 18-inches cones were spaced five yards apart around the circle. Additionally, a starting line of three feet was drawn perpendicular to the circle's perimeter.

Procedure

When the "go" signal was given, the players dribbled a ball from the beginning point around the round course. The individuals returned to the starting line after dribbling as fast as they could between the cones. There were three trials permitted. A clockwise direction was used for the first trail, a counterclockwise way for the second, and the subject's preferred route for the third.

Scoring

The sum of the two best trials' times determined the final test result **(Morgan Christian General Soccer Ability Test, 1979** as cited in **Yobu A,, 2010)**.

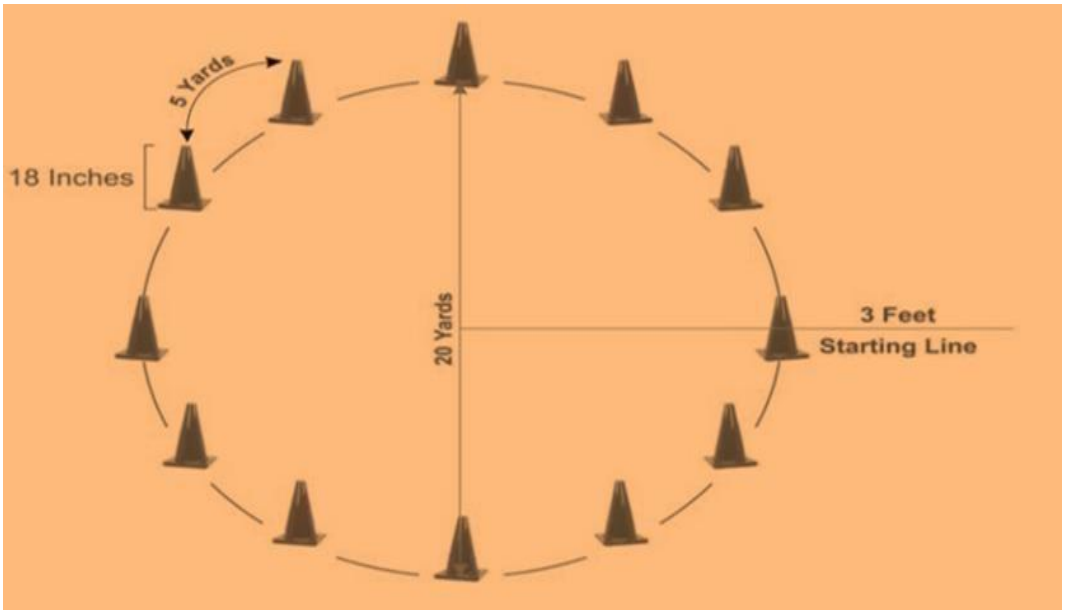

Figure: 3.2 The Markings Z of Morgan Christian General Soccer Ability Test for Dribbling

3.14.12 Shooting-Morgan Christian General Soccer Ability Test for Shooting

Purpose

To calculate the shooting ability of the subjects.

Equipment

Footballs, Goalpost, Stopwatch, Scoring Sheet.

Field Marking

Ropes hung from the crossbar were used to divide the football goal into two separate scoring zones, placed at a distance of four feet from each goalpost. Within each of these zones, two circular targets were created using hoops, each with a diameter of four feet. Additionally, a restraining line was marked 16 yards in front of the goal, running parallel to the goal line, to help regulate the scoring attempt area.

Procedure

The individuals put the stationary ball at any location along the restraining line and used their favorite foot to shoot it towards the target from the training line. Each of the four target areas was attempted four times in a row after the four permitted practice trials, for a total of 16 tries.

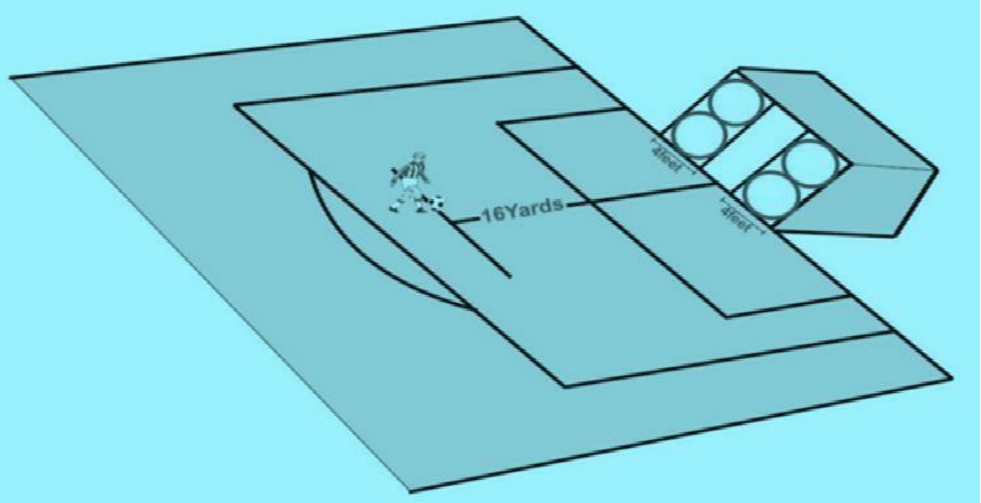

Figure: 3.3 The Markings of Morgan Christian General Soccer Ability Test for shooting

Scoring

Bullets that passed through a suitable target were worth ten points, but bullets that passed through a lower target while aiming at the upper target were worth four points. The sum of the 16 trials was the final score **(Morgan Christian General Soccer Ability Test, 1979** as cited in **Yobu A., 2010).**

3.15 Collection of Data

This study focused on examining the influence of twelve independent variables on a single dependent factor—namely, the physical fitness, physiological response, and skill-based performance of football players. Data collection was done in two phases: pre-test measurements were taken two days before the training program commenced, while post-test data was recorded immediately after the completion of a twelve-week training period.

3.16 Statistical Technique

The primary objective was to evaluate how high-intensity interval training, aerobic training, and their combination affected the overall performance of collegiate football players. To compare the results before and after training within each group, the dependent

"t" test was applied. For comparing the baseline scores across the groups on selected physical and physiological indicators, analysis of variance (ANOVA) was employed. After the training phase, the differences in fitness levels and skill performances were assessed through ANCOVA to account for any initial disparities. In cases where ANCOVA indicated statistically, the post hoc test of Scheffe was employed to pinpoint the exact group-wise variations. All analyses were carried out at a 0.05 level of significant value.

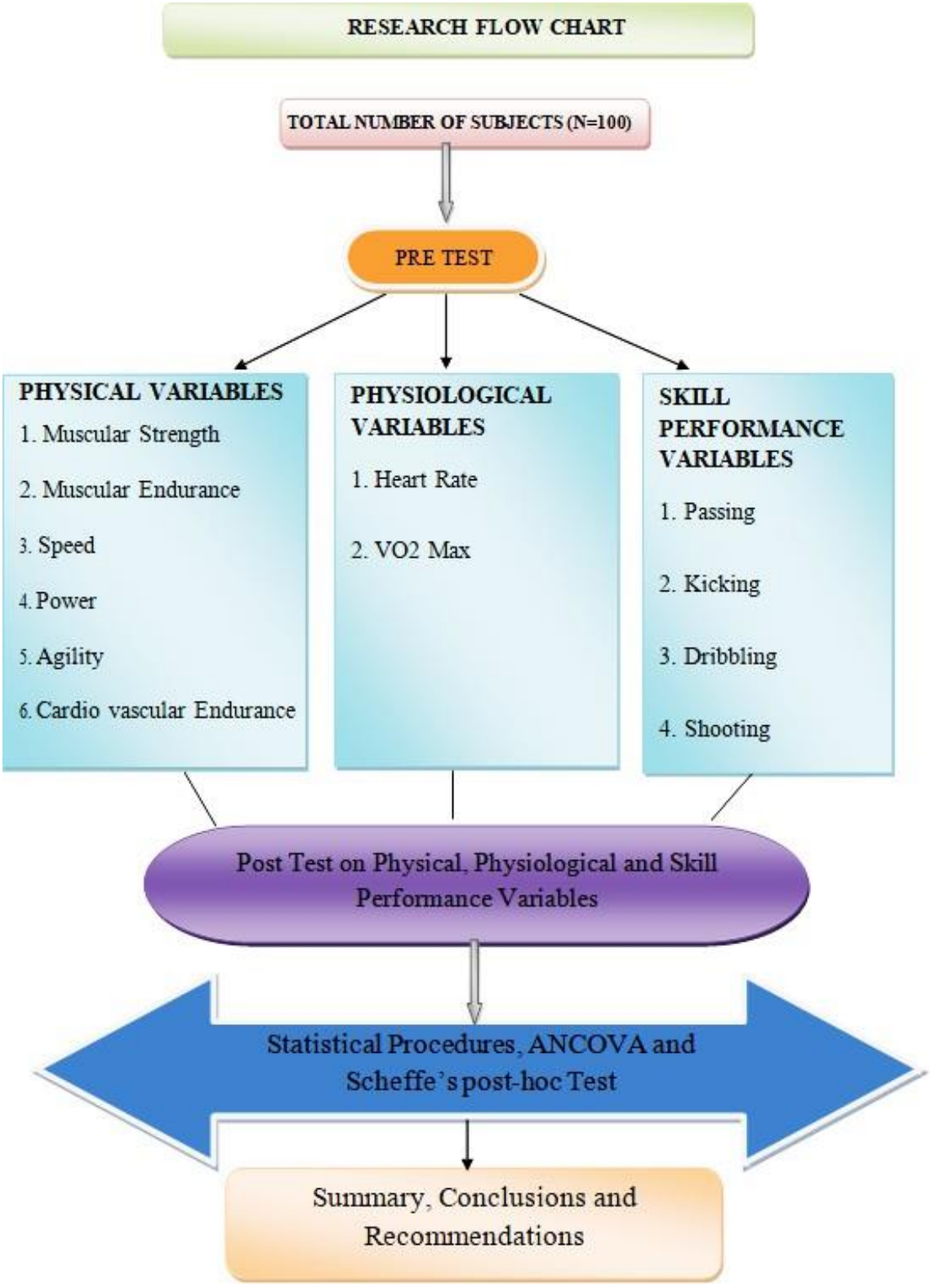

Figure: 3.4 Research Flow Chart Showing Methodology Adopted in the Study