CHAPTER-3

MATERIAL AND METHODS
CHOICE OF THE SUBJECTS AND INVESTIGATION METHODOLOGY

Smoking and Non-smoking athletes:

Healthy athletes who participated in sub-junior nationals, junior nationals, senior nationals, and all India inter university tournaments and who are non-alcoholics, non drug addicts, who consistently oblige for conducting Kraus Weber test and Standard Field Tests like Six Pound Medicine Ball Put, Trunk Hip Flexibility Test, Twelve Minutes Run Test, Fifty Yards Dash Test, Shuttle Run Test, Bent Knee Sit Ups Test, Standing Broad Jump Test were chosen after careful personal enquiry. The age groups selected for studying the effect of smoking on athletes are 19-21, 22-24, 25-27 and 28-30 years.

Studies were conducted in S.K. University College, Anantapur; Vijayanagar college of Physical Education, Anantapur; College of Physical Education, Inkollu; Zion College of Physical Education, Cuddapah; Rayalaseema College of Physical Education, Prodatur; and Gnana Bharathi College of Physical Education, Hyderabad; Andhra Pradesh, India.

One Eighty five non-smoking subjects and 122 smoking subjects belonging to different age groups mentioned above were chosen for the study. The number of smoking athletes available were only 122 where as the non-smoking athletes available were one hundred and eighty five. Due to elimination of non-obliging smokers, alcoholics and drug addicts the number chosen has to be limited to 122. The body weights of athletes of different age groups chosen, represented approximately matching weights.
(± or - 5-10 Kg). Less weight and over weight sports persons were eliminated from testing.

Kraus Weber Test was conducted among non-smoking athletes and smoking athletes as a pilot study. To make the investigation process more comprehensive, as a sequel to Kraus Weber Test, Standard Field Test like Six Pound Medicine Ball Put, Trunk Hip Flexibility Test, 12 Minutes Run Test, Fifty yards dash test, Shuttle run Test, Bent Knee Sit Ups Test and Standing Broad Jump Test were conducted to determine as to what extent the motor fitness of the body varied between smoking athletes and non-smoking athletes.

Kraus-Weber Test

The Kraus-Weber Test of Minimum Muscular Fitness consists of six items. They are proposed as tests which indicate the level of strength and flexibility of certain key muscle groups below which the functioning of the whole body as a healthy organism seems to be endangered. As commonly given, the tests are graded on a pass-fail basis. However, partial movements on each test can be scored from 0 to 10. These tests are described below and are administered in the order given.

Test-1: Abdominal Plus:

Strength of the abdominal plus psoas muscles. Subject in supine lying position, hands behind neck; examiner holds feet down. Pass: perform one sit-up. Scoring: 0 cannot raise shoulders from table; 10, full sit-up.
**Test II: Abdominal Minus:**
Strength of the abdominal minus psoas muscles. Subject in same position as in Test 1, except that knees are bent. Pass: perform one sit-up. Scoring: 0, cannot raise shoulders from table; 10, full sit-up.

**Test III: Psoas and Lower Abdomen:**
Strength of psoas and lower abdominal muscles. Subject in supine lying position, hands behind neck; raise feet 10 inches with knees straight, while examiner counts 1 to 10 seconds. Pass: position held for 10 seconds. Scoring: 0-10, depending on the number of seconds the position is held.

**Test IV: Upper Back:**
Strength of upper back muscles. Subject in prone lying position with pillow under hips and lower abdomen, hands behind neck; examiner holds feet down; raise chest, head, and shoulders, while examiner counts to 10 seconds. Pass: position held for 10 seconds. Scoring: 0-10 depending on the number of seconds the position is held.

**Test V: Lower Back:**
Strength of lower back muscles. Subject is in same position as Test IV except feet are raised with knees straight. Pass: position held for 10 seconds; Scoring: 0-10, depending on the number of seconds the position is held.
Test VI: Length of Back and Hamstring Muscles:

Trunk flexibility, or floor-touch test. Subject stands erect in stocking or bare feet, hands at sides, feet together; lean down slowly and touch floor with fingertips, hold for three seconds (bouncing is not permitted); examiner holds knees in order to prevent any bend and to detect a slight bend if it occurs. Pass: floor touch held for three seconds. Scoring: 10, reaches floor and holds for three seconds; 0, distance reached 10 or more inches from floor.

Six Pound Medicine Ball Put:

Test Administration

Purpose: To measure arm and shoulder girdle strength.

Facilities and Equipment: A space in a gymnasium approximately 90 by 25 feet. A restraining line is clearly marked with a second line 16 feet to the rear. The put must be made from between these lines. The event may be measured with a tape measure, but it facilitates administration if concentric circles are placed.

Directions: The event must be explained and demonstrated since the try must be a put and not a throw. The subject stands between the 2 restraining lines and puts the ball straight down the course. He takes 3 trials in succession. Fouls count as a trial, but in the event that all 3 trials are fouls, the subject must put until he makes a fair put.

Instructions: You must take up a position in the putting area with the side opposite the putting arm towards the line of put. You must put the ball and not throw it. You must not step on or over the restraining line during the put.

Scoring: The final score is the distance of the best put measured to the nearest foot.

Testing personnel: One trained assistant to supervise the testing station, to measure the puts and record the scores. Student assistants are needed to mark the spot of the puts and to return the balls to the putting area.

Trunk-Hip Flexibility Tests
Scott and French Test:
Purpose: To measure flexibility.

A 20-inch scale, marked in half-inch units, is attached to a stable bench or chair so that half the scale is above and half below the level of the bench. An alternative method is to arrange the scale so that the bench level is zero, with half-inch deviations progressing upward and downward from that point. The scale should not be more than three inches wide.

In taking this test, the subject stands with toes even with the front edge of the bench and against the sides of the scale. The trunk is bent forward, fingers in front of the scale. The subject then reaches slowly downward as far as possible, the fingertips of both hands moving parallel and equally down the

scale. The knees must be kept straight. The score is the distance on the scale at the lowest point reached by the fingertips in the downward stretch. The investigator advocates easy warm-up bobbings before taking the test.

12-Minute Run Test

Test Administration:

Purpose: To measure circulo-respiratory endurance.

Facilities and Equipment: Flags are placed around the track at 40-yard intervals.

Procedure: The partner is instructed to count the number of laps that are run within the allotted time. When 11 minutes have elapsed, the instructor calls out the time left to run. At the end of 12 minutes, the instructor blows a blast on his whistle and the runner notes the flag he/she has just passed.

Scoring: The observing partner gives the runner the number of completed laps he/she has run. The runner then reports the score in terms of number of laps plus the number of flags passed on the last lap.

Bent-knee sit-ups (one minute):

Purpose: To measure Muscular Endurance.

The pupil assumes a lying position with knees bent, feet flat on the floor, heels not more than 12 inches from the buttocks (knees bent at an angle less than 90 degrees), and hands clasped.


behind neck and elbows squarely on mat, floor, or turf. The feet are held down by a partner. To perform the sit-ups, the pupil brings head and elbows forward in a curl-up motion, touching elbows to knees. In returning to the supine position, the elbows should touch the floor each time. The score is the number of correctly executed sit-ups performed in one minute. No sit-ups are counted when the pupil does not: (a) keep the fingers clasped behind neck; (b) bring both elbows forward in starting to sit up, without pushing off the floor with an elbow; or (c) return to the starting position with elbows flat on the surface before sitting up again.

Standing Broad Jump

Test Administration

Purpose: To measure power.

Facilities and Equipment: Tape measure and a mat space on the floor or an outdoor jumping pit.

Procedure: The student stands behind a takeoff line with his feet several inches apart. Before jumping, the student dips at the knees and swings the arms backward. He then jumps forward by simultaneously extending the knees and swinging the arms forward. Three trials are permitted. Measurement is from the closest heel mark to the takeoff line. Indoor administratability is best accomplished by placing a tape measure on the floor at right angles to the takeoff line and permitting the student to jump along the line. Measurement can then be made by sighting across the tape to the point of the jump.

KRAUS WEBER TEST – I IN PROGRESS
KRAUS WEBER TEST - II IN PROGRESS

KRAUS WEBER TEST - III IN PROGRESS
KRAUS WEBER TEST – IV IN PROGRESS

KRAUS WEBER TEST – V IN PROGRESS
KRAUS WEBER TEST - VI IN PROGRESS

SIX POUND MEDICINE BALL PUT TEST IN PROGRESS
TRUNK-HIP FLEXIBILITY TEST IN PROGRESS
12 MINUTES RUN TEST IN PROGRESS.

BENT-KNEE SIT-UPS (1 MINUTE) TEST IN PROGRESS
STANDING BROAD JUMP TEST IN PROGRESS

SHUTTLE RUN TEST IN PROGRESS
50 YARDS DASH TEST IN PROGRESS
Instructions: You must take off from both feet simultaneously. Jump as far forward as possible, and land on both feet. Try not to fall backward after the landing. You can jump further by crouching before the jump and swinging your arms.

Scoring: The score is the distance between the take off line and the nearest point where any part of the student's body touches the floor. It is measured in feet and inches to the nearest inch. Only the best trial is recorded.

Testing Personnel: One trained tester can administer this item and judge and record the score.

Shuttle Run

Test Administration:

Purpose: To measure agility

Facilities and Equipment: Two lines parallel to each other are placed on the floor 30 feet apart. Since the student must overrun both of these lines, it is necessary to have several feet more of floor space at either end. Two blocks of wood, 2 by 4 inches and a stopwatch are needed.

Procedure: The student stands at one of the lines with the 2 blocks at the other line. On the signal to start, the student runs to the blocks, takes one, and returns to the starting line, and places the block behind that line. He/she then returns to the second block, which is carried across the starting line on the way back. Two students can run at the same time if 2 timers are

available, or if 1 test administrator has a split-second timer, and of course, if there are 2 sets of blocks. Two trials are permitted. If the students start first at one line and then at the other, it is not necessary to return the blocks after each race. Sneakers should be worn or the students may run barefooted.

Instructions: On the signal to "GO", run as fast as you can to the next line and pick up a block. You should return the block over the second line where you place it on the floor. Do not throw it. Returning the second block, you may run across the starting line as fast as you can without placing the blocks on the floor.

Scoring: The score is the elapsed time recorded in seconds and tenths of seconds for the better of 2 trials.

Testing Personnel: One trained tester can administer this test and time and record the score. If he has a split-second timer, he may have 2 students running at the same time. If 2 regular stopwatches are available 2 timers can be used.

50 Yard Dash

Test Administration:

Purpose: To measure speed

Facilities and Equipment: An area on a track, football field, or playground with a starting line, a 50-yard course, and a finish line. Two stopwatches or a split second timer.

Procedure: After a short warm-up period the student takes a position behind the starting line. Best results are obtained when

2 students run at the same time for competition. The starter uses the command, "Are you Ready"? and "Go". The latter is accompanied by a downward sweep of the arm as a signal to the timer. The students run across the finish line. One trial is permitted.

Instructions: You may take any position behind the starting line you wish. On the command, "Go" you are to run as fast as you can across the finish line. Do not slow up until you are across the finish line. Then you may slow down gradually.

Scoring: The score is the elapsed time to the nearest tenth of a second between the starting signal and the instant the student crosses the finish line.

Testing personnel: One starter and 2 timers are needed to administer this test. If the "split-second timer is available, only 1 timer is needed. The timer can record scores. But testing is facilitated if he is assisted by a recorder.

Statistical Treatment

Appropriate statistical treatment was administered. The statistical procedures include, calculation of mean and Standard Deviation, Application of student "T-test", and ANOVA.