CHAPTER II

PROCEDURE

In this chapter are description of the subjects, the dependent and independent variable, administration of test and collection of data the design of study and statistical treatment of data.

Subjects

The subjects selected for the study were Junior Women Basket Ball players of top four winning teams in the Junior National Basket Ball Championships held at Salara, Maharashtra in May 1994. As the subjects were of different economic strata it is reasonable to assume some difference in the Physical condition of the players.

Dependent Characteristics

Basket Ball playing ability was the dependent characteristic for this study.

Independent Characteristics

The independent characteristic were Resting Pulse Rate, Explosive Power, Grip Strength, Body Composition (Triceps, Suprailliac and Thigh) Cooper's 9 min. run/walk test, Height and Weight.
Reliability of Data

The reliability of data was ensured by establishing the instrument reliability, testers' competency, reliability of tests and subjects' reliability.

Stop Watch

The stop watches used to measure time duration were 1/10th of a second category, which were all calibrated Swiss made, supplied by M/s Krishna Watch Company, Bombay.

Skin Fold Caliper

The Skin Fold Caliper used in the study was supplied by Lafayette Instrument Company, Sagamore and North 9th street, Lafayette, Indiana 47903 Box 5729 J. S. A.

Steel Tape

The tape used was non-elastic, elastic and flexible, which was calibrated and approved for use by the research laboratory of Laxmibai National College of Physical Education, Gwalior.

Weighing Machine

The Weighing Machine used for this measured weight to the nearest half kgms. The machine was calibrated before finally taking the weight.
Anthropometric Rod

The Anthropometric Rod was utilized for measuring Height which was supplied by Patiala Instruments & Chemicals, Sirhindi Bazar, Patiala (Punjab).

Grip Dynamometer

The Grip Dynamometer used in the study was supplied by Lafayette Instrument Company, Sagamore and North 9th street, Lafayette, Indiana 47903 Box 5729 U. S. A.

Thus all the instruments used for taking various measurements and performance of the subjects on different variables were considered reliable and precise enough for the purpose of the study.

Reliability of Data and Tester

The tester competency was evaluated together with the reliability of the tests. To determine the reliability of tests on selected variables the measurement was recorded twice under identical conditions by the same ten subjects were randomly selected for the retest which was administered a day later.

Pearson's Product Moment Correlation Coefficient was computed between the two set of scores of each characteristic to obtain reliability coefficients.
Subject Reliability

The correlations coefficient values found also establish the subject reliability, as same subjects were tested under similar conditions by the same tester on consecutive days.

Design of the study

This was a status study involving Junior Women Basketball Players of top four winning teams at the Junior National Basketball Championship held at Satara, Maharashtra, May 1994. The relationship between the playing ability and other independent characteristic was tried to be established.

Administration of Test and Collection of Data

Independent Characteristics

Independent Characteristics used and the procedures for measuring them were as follows:

Weigh:

Instrument: Weighing Machine

Technique: Weight to the nearest half Kg was recorded with the subjects standing in the center of the scale platform. Only shorts and T-shirts were worn by the subjects.
Height

Instrument: Anthropometric Rod

Definition of Measurement: Erect body length from the soles of the foot to the vertex.

Posture: Erect standing, feet together with heels, buttocks upper back and rear of head on contact with the scale.

Technique: As the square was brought onto the subject's vertex, he was instructed to take a deep breath and to stretch up to his full height.

Height was recorded to the nearest millimeter.

Resting Pulse Rate

This was collected at the Hotel where the teams were staying before taking any test. The pulse was counted by palpating at the radial artery. The score was recorded as number of beats per min.

Explosive power was calculated using the highest value of

Cooper's 9 minute Run/Walk Test

The subject stood behind the line of the 400 mts track of
the Satara Gymkhana Stadium. The space was divided into eight equal parts to facilitate measuring the distance run by the subjects. Each runner was provided with a stopper. On the starting signal the subject started taking rounds of the track. The
spotter maintained the count of each lap run by the runner. At the completion of the 8th minute a signal was given for the last minute. At the 9th minute completion the final signal was given. Determined by multiplying the number of laps completed 400 times plus the number of segments of an incomplete lap, was the score of the subject. The final score of each subject was recorded in the distance covered in meters in 9 minutes.

Verticle Jump Test (Sargent Jump)

This test was used to measure the power of the legs in jumping vertically upward. The subject stood with one side toward the wall, heels together and held a one-inch piece of chalk in the hand nearest to the wall. A mark is made with the chalk on the wall keeping the heels on the ground. The subject then jumped as high as possible and made another mark on the wall at the height of his jump.

Explosive power was calculated using the highest value of three vertical jumps applied to the Lewis formula

\[ \sqrt{4.9 \times \text{Weight} \times \sqrt{D}} \]
Grip Strength

Instrument: Grip Dynamometer

Technique: The subject stood erect without any support, holding the grip dynamometer in the hand. The elbow was kept slightly bent and the hand described a sweeping area downward as she squeezed the dynamometer. Reading on the dynamometer was recorded to the nearest half kilogram. The grip strength of the playing hand was recorded, allowing three trials.

Body Composition

The body composition was calculated from the scores of the skinfolds from three sites those are triceps, suprailliac and thigh skinfolds, using the computer programme given in James R. Marrow, Jr. and James M. Pivarnik's book Simulated Exercise Physiology Laboratories. To calculate Body Composition Gender, Weight, Age and Sum of Skinfolds (triceps, suprailliac and thigh).

Triceps

Procedure: The subject stood with his arms by his side and elbow extended but relaxed.

The measures obtained were of Body Density Percent Fat, Fat Weight and Lean Body Weight.

Subcutaneous Fat: General Instructions

Instrument: Skin Fold Caliper

Technique: The objective was to measure the thickness of a complete double layer of the skin and subcutaneous tissue without including any underlying muscle tissue. A double layer of skin and subcutaneous tissue was grabbed with the thumb and fore finger, the fold being large enough to get so much skin and fat as might cause excessive amounts of tension beyond the fingertips. The fold of skin was held somewhat loosely while the center of the caliper faces were one centimeter from the edges of the thumb.

The reading on the dial of the caliper was taken after applying full spring pressure of the instrument for all measurements. Time was allowed for the full pressure of the caliper to take effect, but not so long that the fat could be 'squeezed' out of the skinfold. The measurement was recorded to the nearest 1/10th of a millimeter.

Triceps

Posture: The subject stood with the arms by the side and elbow extended but relaxed.
Technique: The skinfold was raised with the thumb and forefinger of the left hand over the triceps muscle on the back of the right arm, half way between the acromion and the elbow, the skinfold running parallel to the long axis of the arm.

Supra-illium

Posture: The subject stood in normal erect posture.

Technique: The subject was instructed to draw a medium breadth and hold it. The skinfold was raised with the thumb and forefinger of the left hand in a position, one to two inches above the right anterior superior iliac spine so that the fold ran forward and slightly downward.

Thigh

Posture: The subject stood in normal erect posture.

Technique: The subject was instructed to draw a medium breadth and hold it. The skinfold was raised with the thumb and forefinger of the left hand on a vertical fold on the anterior aspect of the thigh, midway between hip and knee joints.

Dependent Characteristics

Playing ability of the subjects was measured by having three judges rate the ability of each player during actual games. Each subject was observed for over a 20 minutes period during which the judges observed and rated the ability in the fundamentals of the game viz., Passing, Dribbling, Shooting, Defense etc., as well
as execution tactics. Each judge gave marks using a Likert type rating scale. The marks obtained by each subject were summed and averaged to get the final scores in playing ability. A sample copy of the Rating Scale is included as Appendix-A to this report.

Logic for Selecting the Characteristics:

Whenever an individual carries on endurance type of activity it is mainly affected by various physicochemical and anthropometric variables of the person concerned on the top of that body composition (fat percentage and lean body mass) also contribute significantly towards his performance. There are many characteristics 1 factors which ultimately influence the endurance work of the individual but some of the most important characteristics are biceps, triceps, thigh, subscapular and suprailiac (Which actually depict the body composition).