Chapter - III

PROCEDURE

In this chapter subjects, selection of variables, tester competency and reliability of the test, collection of data, criterion measures, procedure for administering the test, and statistical techniques adopted for the analysis of the data are presented.

Subjects

The subjects selected for this study were male basketball players of different universities of Madhya Pradesh those who participated in M.P. State Inter Division (Intervarsity) Basketball Championship during 2001-02. Seventy two basketball players of six universities basketball team which comprised of twelve players each participated in the championship. Subjects selected for this study were studying in graduate and post graduate classes of different colleges of madhya pradesh. The average age of the subjects were 21 year ranging from 18- 24 years of age. Selection of the subjects according to university teams is given in Table 1.
TABLE - 1

LIST OF UNIVERSITIES OF MADHYA PRADESH

<table>
<thead>
<tr>
<th>S.No.</th>
<th>NAME OF THE UNIVERSITIES</th>
<th>NUMBER OF PLAYERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rani Durgawati University Jabalpur</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>Vikram University Ujjain</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>Barkatullah University Bhopal</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>Hari Singh Gaur University Sagar</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>Awdhesh Pratap Singh University Rewa</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>Jiwaji University Gwalior</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>72</strong></td>
</tr>
</tbody>
</table>

Selection of Variables

The research scholar reviewed the available scientific literature pertaining to the game of basketball from books, journals, periodicals, magazines and research papers and listed down the important physical fitness components and required basketball playing ability are desirable for better performance in basketball. The experts in the field of basketball were consulted and detailed discussion were held related to the performance requisites of basketball. On the basis of review of literature, experts opinion and scholar's own understanding of the game the following variables were selected for the purpose of this study.
Independent Variables

1. Speed
2. Strength
3. Endurance
4. Flexibility
5. Agility

Dependent Variables

Basketball playing ability

**Tester Competency and Reliability of Tests**

The investigator followed a standard procedure for physical fitness components and basketball playing ability under the direct supervision of three experts of basketball. All the measurement were taken by the investigator with the assistance of experts and lecturers. To determine the reliability of test as per indian conditions the performance of 12 subjects selected at random were recorded twice under identical condition on the physical fitness components. Pearson's Product Moment correlation was computed between the two measures of each variable and their reliability coefficient have been presented in table - 2.
TABLE - 2

RELIABILITY COEFFICIENT OF TEST AND RETEST SCORES

<table>
<thead>
<tr>
<th>S.No</th>
<th>NAME OF THE TEST ITEMS</th>
<th>COEFFICIENT OF RELIABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Speed</td>
<td>0.94</td>
</tr>
<tr>
<td>2</td>
<td>Strength</td>
<td>0.96</td>
</tr>
<tr>
<td>3</td>
<td>Endurance</td>
<td>0.93</td>
</tr>
<tr>
<td>4</td>
<td>Flexibility</td>
<td>0.95</td>
</tr>
<tr>
<td>5</td>
<td>Agility</td>
<td>0.89</td>
</tr>
</tbody>
</table>

Collection of Data

After establishing the reliability of the test the data was collected by using the different criterion measures and standard procedure for different tests of physical fitness components which are as follows.

Criterion Measures

The data of physical fitness variable and playing ability in basketball was collected by using the following criterion measures:

1. Speed of the subjects was recorded in 1/10th of a second by using 50 meter dash test as criterion measures.
2. Vertical jump of the subjects was recorded in centimeters by using Vertical jump test was criterion measures for explosive strength of legs.

3. The total distance covered and recorded to the nearest 25 meters by using Cooper's 12 minutes run/walk test served as the criterion for cardiovascular endurance.

4. The flexibility recorded in the nearest centimeter through shoulder and wrist elevation test served as criterion for measuring the flexibility.

5. The total time taken to complete the course of semo agility test was the criterion measures for agility of the subjects.

6. The basketball playing ability was graded out of 50 points by a panel of three basketball experts and average of these three was the criterion for basketball playing ability.
Procedure for Administering the Tests

Physical Fitness

50 Meter Dash

Purpose:

Purpose of this test was to measure the speed.

Equipment and Facilities:

Stop watch, record sheet, pencil and wooden clapper.

Description:

On the standard 400 meter track, a 50 meter course was marked with starting and finishing line. After a short warm up period subjects took their standing start position behind the starting line and two timekeepers were assigned to each runner and they stand near the finishing line. For obtaining the best result two subjects were made to run at a time. The commands "on your mark" set and "go" was given and simultaneously watch started. The subjects sprinted across the finish line.

Scoring:

Two trials were given to each subject and best of two trials performance was recorded to the nearest 1/10th of a second as a final score.¹

Vertical Jump

Purpose:

Purpose of this test was to measure the explosive strength of legs.

Equipment and Facilities:

Marking on the wall, record sheet, pencil and coloured chalk powder.

Description:

Strength of the subjects was measured with the help of vertical Jump (Figure -1). The subjects were made to stand with one side of the wall with heels together using hands in coloured chalk powder. Keeping the heels on the floor subject extend his arm upward as high as possible and make a mark on the wall with the chalk powder. Then the subjects were asked to follow the instruction and jump vertically as high as possible and make second marked on the wall with the chalk powder of the maximum height of his jump.

Scoring:

Distance between the standing reach and the maximum jump mark, best of two trials was the final score of the subjects and was recorded to the nearest half of a centimeter.²

SEQUENTIAL PHOTOGRAPHS OF VERTICAL JUMP TEST

Figure - 1
Cooper's 12 Minutes Run / Walk Test

Purpose:

Purpose of this test was to measure the cardio-vascular endurance.

Equipment and Facilities:

Stop watch, whistle, clip board, score-sheet and pencil.

Description:

This test was administered at 400-meter track. The 400-meter track was divided into 16 equal parts (zone) of 25 meter each. All the subjects were assembled at the starting line and necessary instructions were given such as the subjects should run/walk continuously for a duration of 12 minutes, a warning whistle will be given at the end of 11 minutes, they should run as close as possible to the inner border of the track, to stop where ever they are at the final long whistle. The main aim was to cover the maximum possible distance. Subject took the standing start position behind the starting line, curve start was given and four subjects ran at a time and one assistant were assigned to each runner to maintain the distance record of the test. The signal "go" was given to start and simultaneously time keepers started the stop watches. Two time keepers were employed to get the accurate time. After the end of 11th minutes warning whistle was blown so that assistant could get alert and runners could put in their best effort. At the end of 12th minute, long whistle was blown and each subject stopped where they were as
instructed before and total distance covered in 12 minutes duration was recorded in meters.³

Shoulder and Wrist Elevation Test

Purpose:

Purpose of this test was to measure the shoulder and wrist flexibility.

Equipment and Facilities:

One yard stick, one meter scale, clip board, score-sheet and pencil.

Description:

This test was administered at basketball court. Before administration the test was fully explained and demonstrated to the subjects ( Figure - 2 ). Subjects assumed a prone position with chin touching the floor and both hands extended in forward direction. An assistant positioned infront of the subject with meter scale, his hand and subject grasped the yard stick with hand grip at about shoulder width apart and raised the stick upward as high as possible while chin in touch with the floor and elbows were kept straight and vertical distance was recorded from the floor to the lower edge of the yard stick at mid point between the hands of the subject and recorded to the nearest centimeter.

³Ibid.143-144.
Measurement of the arm length was taken from acromion process to the tip of the middle finger while standing erect and arm completely in relaxed position.

**Scoring:**

The best lift of three trials was subtracted from the arm length, which constitute the final score.

\[
\text{Final Score} = \text{Arm Length} - \text{Best Lift}^4
\]

**Semo Agility Test**

**Purpose:**

Purpose of this test was to measure the agility of the subjects.

**Equipment and Facilities:**

Free throw lane of a basketball court, four Indian clubs, stop watch, score-sheet and pencil.

**Description:**

This test was administered at basketball court. Restricted area of standard basketball court was used for this test, the distance between the narrow end of the free throw lane is 3.60 meter and distance between the wider end of the free throw lane is 6 meter whereas the distance between the free throw line and end line is 5.80 meter as shown in Figure - 3.

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4 Ibid. 83 - 84.
MARKING OF SEMO AGILITY TEST

Figure - 3
Before administration the test, desire marking were made and four Indian clubs were placed at each corner of the restricted area and the test was explained and demonstrated to the subjects. The subject stood outside the free throw lane (at A) with his back to the free throw line as shown in the Figure. Scholar gave the signal "ready, go" and simultaneously watch started. The subject rushed to point B with side stepping and passed outside the Indian club which was placed at corner B as a block. He then back pedaled from B to point D and moved into the inside of the Indian club placed at point D. He then sprinted forward from D to point A and crossed from outside the Indian club placed at corner A. He then back pedaled from A to point C and passed to the inside of the Indian club placed at corner C. He then again sprinted forward from C to point B and passed outside to the Indian club placed at corner B. He then moved from B to the finish line at point A. As he crossed the finish line watch stopped and total time was recorded to the nearest 1/10th of a second. Two trials were given to each subject and best of two trials was considered as the final score.

Note: Before actual administration of test one practice trial was given to each subject.\(^5\)

\(^5\)Ibid. 219 - 221.
Basketball Playing Ability

The performance in basketball was judged during playing situation with the help of three experts who formed the panel of judges. The subjects were graded out of 50 marks. The average of three experts grading constituted the final score of playing ability.

Analysis of Data

The data obtained by various criterion measures for various physical fitness components and playing ability of basketball players was subjected to the statistical methods in order to compare with players of different universities following statistical techniques were used :-

1. Pearson's Product Moment Correlation
2. Analysis of Variance.

In order to test the hypothesis, level of significance was set at 0.05.