Chapter III

PROCEDURE

In this chapter, the procedure adopted for the selection of subjects, criterion measures, administration of tests, design of the study, testers reliability and reliability of tests, instrument reliability, collection of data and statistical procedure employed have been explained.

Selection of Subjects

Sixty male students, studying the Bachelor and Master Degree classes of the Lakshmibai National College of Physical Education, Gwalior, were selected as subjects for the purpose of this study. The age group of the subjects were ranged between 17 to 24 years. The subjects were divided into four groups, 12 in each group on the basis of the pre-test. These groups were randomly assigned to different experimental groups. All the subjects were residents of the college and they had similar routine of the college activity and they had similar routine of diet, work, rest, sleep etc. All the subjects enjoyed good health (which was verified from the college health centre records) and all of them participated in the regular activities in accordance with the requirement of the college curriculum.
**Criterion Measure**

The criterion measures of selected hockey skill performance, adopted in this study are as follows:

a) Angular Hitting and Stopping,

b) Pass Receiving, Dribbling and Hitting,

c) Dribbling and Goal Shooting.

**Administration of Tests**

Before administration of tests, a meeting of all the subjects and testers was held at the College Hockey Field. The requirement of the testing procedures were explained to them in detail so that there was no doubt in their mind regarding the effort and strain they had to endure in addition to their participation in the daily schedule of the college. All the subjects and testers agreed to co-operate in the testing programme to the best of their abilities inspite of the fact that no motivational techniques were used in this study.

The subjects were divided into four groups, 12 in each group on the basis of pre-test. These groups were randomly assigned to different experimental group. Such as Normal Group, Early Group, Late Group and Irregular Group. Before administering
the test all the groups were given 10 days of exposure to their respective sleep condition i.e. Normal Group subjects were asked to go to bed approximately around 10.00 pm. daily as the Normal sleep timing was considered at 10.00 pm. and it was fully ensured that all the subjects were on bed by around 10.00 pm.

Early group, subjects were asked to go to bed daily two or more hours earlier than the normal schedule timing and care had been taken in terms of their sleeping time and it was ensured that all the subjects maintained the timing throughout ten days of exposure.

Late group, subjects were allowed to go to bed in the late night three or more hours after the Normal sleep time and to keep them awake they were sometimes shown movies or other sort of enjoyment during the ten days of exposure. It was ensured that all the subjects went to bed at reasonably late in the night.

Irregular group, during ten days of exposure were allowed to go to bed late on first, fourth, seventh and ninth day; at normal sleep time on second, fifth and eighth day; and early on third, sixth and tenth day. Care had been taken in respect to their
sleep timings and it was ensured that all subjects maintained the respective sleep timings.

**Angular Hitting and Stopping**

**Purpose**

The purpose of this test was to measure Angular Hitting and Stopping Ability of the subjects from the right side as well as from the reverse side.

**Equipment and Supplies**

A wall measuring 4 yards x 7 yards, hockey sticks, hockey balls, measuring tape and stop watches.

**Group Marking**

A proto-type of hockey goal mouth was drawn on a wall, its dimension were of the standard size, i.e. 7 feet high and 4 yards in width. A twelve feet long re-straining line was drawn ten feet away from the wall towards the starting point and parallel to the wall. Two hitting areas of 1½ yds. square on both the ends of the restraining line were drawn. A one feet square ball box was drawn 15 feet away from the wall parallel to the
restraining line behind the starting line. (Figure 1)

Description.

Subjects were asked to stand at the centre of the restraining line and on the signal "ready go", he according to his wish started dribbling towards any hitting area and as he entered in the area, hit the ball towards the wall at an angle. After hitting the ball he ran and collected the rebound on either right or reverse side of the stick, than dribbled it towards another hitting area and repeated the same skill. If the subject missed the ball during one minute period he collected another ball from the ball box and continued the same skill till one minute was completed. Administration of this test has been depicted in Figure 2.

Score.

The score was counted as to how many times the subject touched the right and left hitting areas in one minute. Three trials were given to each subject and the score of the best trial was recorded.¹

Pass Receiving, Dribbling and Hitting

Purpose.

The purpose of the test was to measure the Pass Receiving,  

Fig. 1: FLOOR PATTERN OF ANGULAR HITTING AND STOPPING SKILL TEST.
Fig. 2: PHOTOGRAPHICAL PRESENTATION OF ANGULAR HITTING AND STOPPING SKILL TEST.
Dribbling and Hitting ability of subjects in terms of time taken by them to perform these skills.

**Equipment and Supplies.**

Hockey sticks, hockey balls, Indian clubs, stop watches, measuring tape and score sheet.

**Ground Marking.**

A line (shown in Figure 3) "A B" of 8 yards in length was drawn to serve as a starting line. Another restraining line "C D" parallel to the starting line of 8 yards at a distance of 15 yards from the starting line was drawn. An end line "E F" of 8 yards in length parallel to the restraining line was drawn at a distance of 20 yards from it. Six Indian clubs G,H,I,J,K and L were placed. Indian clubs H,I,J,K were placed in a zig-zag way 4 yards away from each other. Twelve yards away from the starting line, a three yards wide pass receiving area was marked by a line.

**Description.**

The subjects was stationed at the starting line after alerting the subject by the signal "ready" the investigator passed the ball towards restraining line and simultaneously gave the signal "go", subject ran to receive the ball within the pass receiving area. After receiving the ball subject started dribbling the ball in a zig-zag way around the six Indian clubs. As he reached the
end line, he turned back and hit the ball towards the starting line. As soon as the ball crossed the starting line, the stop watch was stopped. Administration of the test has been depicted in Figure 4.

A Score.

Time taken by the subject to complete the task was the score, which was measured nearest to 1/100th of a second. Each individual was given three trials from each side right and left consecutively and the best trial from each side was taken as a score.

The purpose of the test is to measure the dribbling ability of subjects in terms of time taken by him and to measure shooting accuracy ability of the subject in terms of total points taken by him from the target area.

Fig. 3 : FLOOR PATTERN OF PASS RECEIVING, DRIBBLING AND HITTING SKILL TEST.
end line, he turned back and hit the ball towards the starting line. As soon as the ball crossed the starting line, the stop watch was stopped. Administration of this test has been depicted in Figure 4.

**Score.**

Time taken by the subject to complete the task was the score, which was measured nearest to 1/100th of a second. Each individual was given three trials from each side right and left consecutively and the best trial from each side was taken as a score.  

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**Dribbling and Goal Shooting**

**Purpose.**

The purpose of the test was to measure the Dribbling ability of subjects in terms of time taken by him and to measure Goal Shooting accuracy ability of the subjects in terms of total points taken by him from the target board.

**Equipment and Supplies.**

Target board, flags, hockey balls, hockey sticks, stop watches, score sheets, and measuring tape.

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2Ibid., p. 41.
Ground Marking.

On the marked centre of the circle, two parallel lines, 50 degree to the goal line, Two markers were for taking the positions. The distance from the circle and from the top of the sides in which the hockey balls were placed was at the goal mouth, which was numbered series from 1 to 6, as shown more, cre- ating the goal mouth. In the six points were awarded for shooting at the extreme points on the either side. (Figure 5)

Fig. 4: PHOTOGRAPHICAL PRESENTATION OF PASS RECEIVING, DRIBBLING, AND HITTING SKILL TEST.
Ground Marking.

On the shooting circle two shooting angles were marked at 60 degree on both right and left side from the centre of goal line. Two yards inside the shooting circle another circle parallel to the shooting circle was drawn as a restricted area for taking the shot into the goal. Five flags were kept on both the sides in a zig-zag formation 5 feet from each other. The distance from the first flag to the angle flag was 20 feet. Five hockey balls were kept at the top of the stricking circle and one was at the starting point which was 18 feet away from the top of the striking circle. A target board was kept at the goal mouth, which was divided into 12 segments. Each segment was numbered serially from the centre to the ends on both sides from 1 to 6, as shooting at the centre of the goal area is comparatively easy, more credit was given for shooting at right or left extremes of the goal mouth. One point was awarded for shooting at the middle and six points were awarded for shooting at the extreme ends on the either side. (Figure 5)

Description.

On the signal "ready" the subject was asked to stand on the starting line. On the signal "go" he started dribbling from either left or right side in a zig-zag way in between the flags. When he reached the restricted area he took the shot at the
Fig. 5: FLOOR PATTERN OF DRIBBLING AND GOAL SHOOTING SKILL TEST.
goal with a intention of getting maximum credit of six points. No point was awarded when the ball went wide from the target board. After shooting he ran towards the remaining five ball, which were kept at the top of the circle, and after collecting one, started dribbling from other side and took the shot at the goal. After shooting the last ball the stop watch was stopped and counting of points was completed. Administration of this test has been depicted in Figure 6.

Score.

As the last ball was hit by the subject, the total time taken to complete the full task was noted down. Time was measured nearest to 1/100th of a second. The goal shooting ability of the subject was measured in terms of total points scored by him from the target board. The best performance of three trials was recorded as the score of the subjects.³

Design of the Study

The design of the study was equated group design. As all the subjects were equated on the basis of pre test into four equal groups.

³Ibid., p. 44.
Fig. 6: PHOTOGRAPHICAL PRESENTATION OF Dribbling AND GOAL SHOOTING SKILL TEST.
Tester's Reliability and Reliability of Tests

To ensure that the investigator was well versed with the techniques of conducting the tests, the investigator along with assistants had a number of practice session in testing procedure under the guidance of Dr. R.N. Dey, Reader, Lakshmibai National College of Physical Education, Gwalior. All the tests were taken by the investigator with the help of M.Phil scholars and Master's degree students of Lakshmibai National College of Physical Education, Gwalior.

The tester's reliability was evaluated together with the reliability of tests. To determine the reliability of tests, the performance of ten subjects selected at random on the selected parameters were recorded twice under identical conditions by the scholar. A Pearson's Product Moment correlation was computed between the two measures of each variables and their reliability coefficient are shown in Table 1.
TABLE 1

RELIABILITY COEFFICIENT OF TEST - RETEST SCORES

<table>
<thead>
<tr>
<th>Tests</th>
<th>Coefficient of Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angular Hitting and Stopping</td>
<td>.92*</td>
</tr>
<tr>
<td>Pass Receiving, Dribbling and Hitting from left side.</td>
<td>.87*</td>
</tr>
<tr>
<td>Pass Receiving, Dribbling and Hitting from right side.</td>
<td>.89*</td>
</tr>
<tr>
<td>Dribbling</td>
<td>.89*</td>
</tr>
<tr>
<td>Goal Shooting</td>
<td>.93*</td>
</tr>
</tbody>
</table>

N = 10, r = 0.05 = 0.632

*Significant at .05 level.

From the test - retest coefficient of correlation (Table 1) it was obvious that the testers reliability was significantly high at .05 level, establishing the reliability of the testers to administer the tests.

The correlation coefficients also indicate the reliability of the tests selected as very high correlation were obtained when the tests were repeated.

Instrument Reliability

The stop watch, measuring tape, and target board was procured from reliable companies. All instruments used were
available at the store of Lakshmibai National College of Physical Education, Gwalior, and their calibrations were accepted as accurate enough for the purpose of the study.

Collection of Data

The necessary data on selected hockey skill performance were collected at different times of the day by administering separate skill test on separate days at the following timings:

Between 7.00 am. and 8.00 am.
Between 10.00 am. and 11.00 am.
Between 1.00 pm. and 2.00 pm.
Between 4.00 pm. and 5.00 pm.

The data were collected at the hockey field of Lakshmibai National College of Physical Education, Gwalior.

Statistical Procedure Employed

For testing the statistical significance, on biorhythm of selected hockey skill performance on varying sleeping timings 'Two Way Analysis of Variance' was used.