CHAPTER - III
METHODOLOGY

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CHAPTER - III
METHODOLOGY

This chapter briefly outlines the procedure adopted in the investigation. It presents how the subjects were chosen, tests were administered, collection of data or raw scores, conduct of instructional classes as well as the procedure adopted to analyse the scores.

3.0 INTRODUCTION

One question that many high jumpers and long jumpers ask, “How can I get my jumps higher?” The repetitive execution of Plyometrics is used to improve timing, alignment, strength, torso stability, co-ordination of joint movement, and finally, as a first component of other movements such as pirouette, relieve and all aerial movements.

There is little information available, analyzing the way jumpers use their muscles to perform highly trained movements such as leaps and jumps. Most studies focus on the treatment of the type of training. The jumpers' demands on incorrect training, can produce underdeveloped bodies which can result in muscle imbalances overdeveloped muscle groups. In a study conducted by Simpson and Kanter, researchers indicated that “Lower extremity injuries are common among jumpers.”

Many of the skills required for jumpers are also used in sports. The before training techniques that have become prominent in sport may also be applicable to jumpers. Jumping exercises and plyometrics enhance performance and speed in sports because they increase leg strength. In a study, power and training the nervous system to activate large muscle groups when you move conducted by Hutchinson, Tremain, Christiansen, and Beitzel.
The researchers suggested that Plyometrics training improved the jumping ability of jumpers. The objective of plyometrics is to generate the greatest amount of force in the shortest of time. Plyometrics trains the nervous system and metabolic pathways to increase explosiveness, giving the athlete the extra push needed to go higher and faster. Plyometrics requires acceleration through a complete range of motion and then relaxation into a full stretch. The quick stretch the athlete applies to the muscle during the initial push-off is thought to increase muscle contraction, therefore increasing power. Sportsmetrics is a plyometrics-based program developed to increase jump height and decrease harm in landings in male & female athletes. It is found that peak landing forces decreased 22 percent, lateral and met forces at the knee decreased 50 percent and there was a 10 percent increase in jump height. The hamstring to-quadriceps strength ratio increased from 50 percent to 66 percent, a more favorable condition for the ACL. As the use of plyometrics training has been shown to be beneficial in generating greater strength output with fewer injuries, the purpose of this study was to assess the effects of high school, college vertical jumps, Depth jump and high jumper vertical jumps and leaps.

3.1 POPULATION:

Younger players of various games and students interested in field of physical education have been considered as population for this study.

3.2 SAMPLE:

Researcher has taken three groups of students selected from Bachelor of Physical Education course from Gujarat State.
The population, the selected students of Bachelor of Physical Education three years course are for all the groups used in this study. The study consists of 120 male students, who passing their XIIth standard examination in General Stream (Arts or Commerce) from Gujarat State and they were representing all districts of Gujarat State. They were admitted to three years degree course Bachelor of Physical education. On the basis of their fitness test, they were divided into three groups considering equal distribution.

Two groups were allotted for experimentation and one group was for comparing as a control group. Each group consisted of 30 students. Two training groups were assigned. One with plyometric exercise training which was called as group-A and another with weight training which was called as Group-B. All the groups were undergoing syllabus requirement of Bachelor of Physical Education course.

### 3.3 SELECTION OF GROUPS:

Three groups were selected on the basis of their performance as under:

- **Group A**: Experimental group for plyometrics exercises (Training)
- **Group B**: Experimental group for weight training exercises
- **Group C**: Control group (without doing any plyometrics exercises as well as other exercises)

Before going to plyometrics and weight training programme, the first tests of the key indicators were taken to analyse in between fitness prior to training programme and after completion of training programme.

### 3.4 ADMINISTERING THE TEST

Prior to starting the training programme for the subjects selected for experimentations, tests were conducted as follows:
Test-1 : 6x10 Shuttle Run

(a) To determine the agility of the subject.
(b) Stop watch measuring 1/100th of second was used.
(c) 10 metres of distance is marked by two paralleled lines of 5 metres each.
(d) The subject stands behind the starting line. On getting the start signal “Go” he runs faster, goes nearest to the other line and touches it with the one hand, turns and comes back to starting line, touches it with hand, turns and repeats it for a total of 6 times.
(e) The time taken by the performer to complete the course of 6x10 mtrs to the nearest 1/100th second is recorded as score of the test.
(f) SCORING : Achievement of each subject was recorded in seconds and standardized norms were applied for getting raw scores converted into results.

Test-2 : Medicine Ball Put

(a) The athlete sits in a straight-back chair and is strapped securely with a belt or waist harness.
(b) With a medicine ball of 12 pounds, the athlete performs a chest pass, applying all the forces possible to the put.
(c) The distance from the chair to the ball’s landing point determines how heavy ball to use for such exercises.
(d) Any passes under approximately 10 to 12 feet in length indicates a need for training with a lighter medicine ball.
(e) Three trials will be given to each subject and best result will be considered.
(f) **scoring** : Achievement of each subject was recorded in metres / centimetres and standardized norms were applied for getting raw scores converted into results.

➤ **Test-3 : Zig Zag Run**

(a) To measure the agility, mobility and flexibility of the subject.

(b) Stop-watch measuring 1/100 seconds was used.

(c) The performer stands behind the take off line with feet together. On getting the start signal "Go" he run faster as per guide line on the path for Zig Zag Run.

(d) The time taken by the performer to complete the course of Zig Zag run to the nearest 1/100th second is recorded as score of the test.

(e) **scoring** : Achievement of each subject was recorded in second and standardized norms were applied for getting raw scores converted into results.

➤ **Test-4 : Vertical Jump**

(a) The athlete stands flat-footed next to a wall or pole and with chalked fingers or an attached piece of tape he or she reaches up and places a mark at the highest point possible.

(b) Remaining in the same place, the athlete will summon all of the forces possible and jump upward off both legs. touching the wall at highest point of the jump.

(c) Again the athlete should have tape or chalk in the fingers in order to make a substantial mark at the two points of emphasis.

(d) This distance between the two marks is the athlete’s jump each height. The highest (jumping) mark will be the criteria for the jump test.
(e) Take the best of three such jump trials, allowing 30 seconds to a minute of rest between each trial to allow the muscle system to recuperate.

(f) Scoring - Achievements of each subject was recorded in inches/centimetres and standardized norms were used for getting raw scores converted into results.

> TEST-5 Standing Board Jump

(a) To measure the explosive strength of the leg.

(b) Measuring tape, a leveled long jump pit with the take off line.

(c) A line is marked near the edge of the jumping pit

(d) The performer stands behind the take off line with feet together. He flexes his lence, takes back arms, raising the heels a little and along with a vigorous forward and upward arm swing be extends the knees into the jumping pit to cover the maximum horizontal distance.

(e) The distance covered the centimeters between the take off line and the nearest landing mark is measured. The score will be best of three trials.

(f) Scoring : Achievement of each subject was recorded in metres / centimetres and standardized norms were applied for getting raw scores converted into results.

> TEST-6 : 800 Meter

(a) To measure the maximum speed

(b) stop watch (1/10th of a second)

(c) The time taken by the performer to complete the course of 800 Mts to the nearest 1/100th second is recorded as of the test.
(d) **scoring**: Achievement of each subject was recorded in metres / centimetres and standardized norms were applied for getting raw scores converted into results.

These six tests were conducted before and after training programme to find out the effect of two training systems.

### 3.5 TRAINING:

Subjects were called to a meeting where the plyometric training Program was explained in detail. The subject were told that the program would be used for twelve weeks. Plyometric training Program consisted of approximately forty minutes of various jumping exercises each day and three days in a week. The subjects were asked to keep record of how many repetitions they completed in each week. The amount of time increased for each exercise. After completing the session, subjects at were allowed to, begin with their regular season workouts and game performances.

### 3.6 CONDUCTING THE TRAINING PROGRAMME:

Plyometric exercise need to have scientific and Systematic planning during training Work-out. In other Words to take advantage of explosive training is to tailor drills to the know our exercises will specifically held our sport, but also gives direction to the Individual Work-out and progressions our plan. During planning, one should know the guidelines of stress sequence and knowledge regarding teaching and learning in addition to plan to progress from general to specific; simple to complex; how to have high intensity.

The following charts provide specific plyometric and weight training work-out programme using the concepts of the stress continuum. The first section offers an all encompassing program basics continuum of exercises that we believe we should incorporate into the beginning of the plyometric and
weight training programs. According to that Researcher has plan for exercise of plyometric and weight training. The can accompany the program basics as subject progress through weeks of continuum. We have used the programme for the full 12 weeks of training without break.

According to Tudor Bompa (1983) each period has certain cycle phase that generates the advancement of special objectives for each training season. It is not uncommon to see recommendations. Reference all this research has plan project dosage guideline as under.

Subjects were accustomed to two hours workouts each day. Three times per week so the new plyometric training intervention had been planned into the existing schedule. Subjects completed 36 plyometric training sessions during twelve weeks. The sessions started with a fifteen minute warm up followed by a conditioning program with general exercises (for about one hour) and finally athletes performed exercises more specific to gymnastics skills.

The Training program involved an upper and lower body workout with weight lifting exercises and jumps. Vertical row also subjected completed about a hundred jumps per session. For example a subject would complete for half squats & jump followed by six drop jumps or four bench processes followed by six jump push ups etc. Subjected were also asked to complete exercises that resembled gymnastics skills, such as jumps followed by a front tuck gymnastics. Subjects were asked to perform an average of three conditioning exercises for the upper body and three for the lower body. For each exercise, they complete four sets of six repetitions in each set with three minutes rest interval between sets during which they did stretching exercises. During the first three weeks of the intervention, the sessions were done at maximum intensity. While the last week was performed at a lighter intensity.
Finally, in order to make sure that the subjects were completely rested before testing, they rested for five days between the end of the training protocol and the post test session.

Specific Training programme was planned for two training groups, one with plyometric training and another with weight training. Detailed training programme was scheduled as follows:

3.7 PROGRAMME:
In training with plyometrics, just as with other forms of stretch and shortening cycle in other words athletics training. It is important to follow certain guidelines to ensure safety as well as power and effective performance. So, we emphasize basic aspects of training that are the keys to good technique.

> Warm-up and Cool down:

Subject were ask for General warm-up about 30 Minutes followed by specific warm up. During specific warm-up number of repetition, speed and rest between two repetition was ensured. Researchers also emphasized on technical form of running (forward, backward and lateral), hiking and jumping during specific warm-up.

3.8 STATISTICAL TOOLS:

The researcher has used some statistical tools for the purpose of analyzing the data related to training programme in Group A, B and C.
Table - 1 Project dosage guidelines

<table>
<thead>
<tr>
<th>Week No.</th>
<th>Load Intensity</th>
<th>Weight</th>
<th>Daily average volumes</th>
<th>Number of exercises, sets and reps</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low</td>
<td>241/194</td>
<td>3-4</td>
<td>2X2X4-8</td>
<td>(42)</td>
</tr>
<tr>
<td>2</td>
<td>Low/Medium</td>
<td>324/256</td>
<td>3-4</td>
<td>2X2-3X4-8</td>
<td>(53)</td>
</tr>
<tr>
<td>3</td>
<td>General adaptation</td>
<td>Medium</td>
<td>3-4</td>
<td>2X2-3X4-10</td>
<td>(61)</td>
</tr>
<tr>
<td>4</td>
<td>General core strength</td>
<td>Low/Medium</td>
<td>4-5</td>
<td>3X2-3X6-10</td>
<td>(80)</td>
</tr>
<tr>
<td>5</td>
<td>Medium</td>
<td>289/235</td>
<td>4-5</td>
<td>3X2-3X6-10</td>
<td>(80)</td>
</tr>
<tr>
<td>6</td>
<td>Maximum strength Medium</td>
<td>Medium</td>
<td>4-5</td>
<td>3X2-3X6-12</td>
<td>(101)</td>
</tr>
<tr>
<td>7</td>
<td>Maximum strength Medium</td>
<td>Medium</td>
<td>5X2-3X6-12</td>
<td>(112)</td>
<td>3X4X4</td>
</tr>
<tr>
<td>8</td>
<td>Maximum strength and power Medium</td>
<td>Medium</td>
<td>5X2-3X8-12</td>
<td>(125)</td>
<td>3X4X4</td>
</tr>
<tr>
<td>9</td>
<td>High</td>
<td>106/86</td>
<td>4X2-3X10-12</td>
<td>(110)</td>
<td>2X4X4</td>
</tr>
<tr>
<td>10</td>
<td>Complexes &amp; combinations Medium</td>
<td>High</td>
<td>3-4</td>
<td>2X2X10-12</td>
<td>(77)</td>
</tr>
<tr>
<td>11</td>
<td>Transaction High</td>
<td>54/54</td>
<td>2X2X10-12</td>
<td>(44)</td>
<td>2X2X4</td>
</tr>
<tr>
<td>12</td>
<td>Evaluation / break</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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