

Effects of Plyometrics Training Programme on Jumping Ability of Junior Men Basketball Players

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Abstract

The study was undertaken to assess the effects of plyometrics training programme on jumping ability of junior men basketball players. The sample comprised of seventeen men players of age 17 to 19 years studying at Senior Secondary School, Bhaini Bagha, Mansa, Punjab. The mean height and weight of men players were found 1.64 ± 0.04 m, 49.5 ± 6.4 kg respectively. The sample was exposed to a self-designed 8-week plyometrics training programme. Three sessions of plyometrics programme per week, were given to players in addition to their regular training. Pre-intervention and post-intervention jumping ability tests were conducted. The results of the study were cheering and reveal the benefits of plyometrics training programme on jumping ability of junior men basketball players. The jumping ability was enhanced as a result of intervening plyometrics training programme. The level of statistical significance was .05.

KEYWORDS: Plyometrics, Jumping Ability.

INTRODUCTION

Today Basketball occupies a place among the most spectacular & popular sports in the world. It caters to the highest level of competition for players of all sexes and of different age groups and provides variety of thrilling and spectacular. Basketball is one of the most successful and popular competitive and recreational sports in the world. It is fast, it is exciting and the action is explosive. Modern competitive Basketball is very fast by its nature and it demands high level of physical & physiological fitness.

The most successful coaches in the world recommend plyometric training programmes for developing explosiveness called speed strength or power. The plyometrics training is based on the principle that a rapid stretching of muscle just prior to shortening will result in much stronger contraction. Yuri Verkoshansky started in late 1960's that individual could significantly improve jumping and sprinting ability by progressive jumping exercises. The Elements ply and metric came from Latin roots for "increase" and "measure" respectively, the combination thus means "Measurable increase". The training is based on the principle that a rapid stretching of normal just prior to its shortening will result in muscle stronger contraction. The stretching of muscle (eccentric contraction) is produce through Depth jumping, bounding or Hopping. The concepts of plyometrics in training have been studied by may scholars (Bompa & Carrera, 2005; Boyle, 2004; Gambetta, 1999; Zatsiorsky & Kraemer, 2006; Beachle & Earle, 2000). Plyometrics has negative phase also if not implied properly. Boocock et al. (1988) have shown that bounding activities result in an increase in spinal loading (as measured by spinal shrinkage) and that this result in increased muscle soreness rating and low-back pain rating on the days following such exercises.

Objectives of the study

The study was planned to fulfill following objectives:

1. To know overall effects of plyometrics training programme on jumping ability of junior men basketball players.
2. To develop an understanding in systematic manner for explosive strength of basketball players especially related to jumping ability.
3. To design a programme for developing power among basketball players.

Operational Definition of important terms:

Plyometric training:

Plyometric training refers to exercise that enable a muscle to reach maximal strength in a short time as possible (Gambetta, 1988).

Amortization Phase

Amortization phase is the period of time from initiation of the eccentric phase (touching the surface) to the initiation of the concentric contraction (start of the upward motion of the jump). As a result the muscle in leg become like rapidly stretched rubber band. To take advantage of the stretch reflex, athlete must keep the amortization phase as brief as possible.

MATERIALS AND METHODS

This was a field experimental study and sample comprised of seventeen men players of age 17 to 19 years studying at Senior Secondary School, Bhaini Bagha, Mansa, Punjab. The mean height and weight of men players were found $1.64 \pm 0.04\text{m}$, $49.5 \pm 6.4\text{kg}$ respectively. The sample was exposed to a self-designed 8-week plyometrics training programme in preparatory-II part of the periodization cycle. All the players were having the background of approximately 4-5 years of training age. The detail of the plyometric training schedule was as follows:

Table- 1: Eight Week Plyometrics Intervention Training Programme

Trainin g Week	Trainin g Volume (foot contacts)	Plyometric Drill	Sets X Repetiti ons	Training Load in terms of Intensity
Week 1	70	Side to side ankle hops	2 X 10	Low
		Ankle Jump	2 X 10	Low
		Front cone hops	5 X 6	Low
Week 2	90	Side to side ankle hops	2 X 10	Low
		Lateral jump over barrier	4 X 5	Low
		Split Squat Jumps	2 X 10	low
		Double leg hops	2 X 5	Medium
		Squat jump	2 X 10	Medium

Week 3	120	Side to side ankle hops Lateral jump over barrier Split Squat Jumps Double leg hops Ankle bounce	2 X 12 4 X 6 2 X 12 3 X 8 2 X 12	Low Low Medium Medium High
Week 4	140	Diagonal cone hops Double-Leg Butt Kick Single leg bounding Plyometric Push-Ups Lateral jump single leg	4 X 8 4 X 8 2 X 12 4 X 7 4 X 6	Low Medium Medium High High
Week 5	140	Plyometric Push-Ups Double-Leg Butt Kick Box jump (60cm) Cone hops with 180 degree turn Single leg bounding Lateral jump single leg	2 X 7 4 X 7 4 X 7 4 X 7 4 X 7 2 X 7	Low Medium Medium Medium High High
Week 6	160	Diagonal cone hops Lateral cone hops Double-Leg Butt Kick Tuck jump Plyometric Push-Ups Box jump (40cm)	4 X 8 4 X 8 4 X 6 4 X 6 4 X 6 4 X 6	Low Low Medium Medium High High
Week 7	140	Lateral jump single leg Box jump (60cm) Tuck jump Double leg hops Depth jump	2 X 12 4 X 6 4 X 6 3 X 8 4 X 6	Low Medium Medium High High
Week 8	120	Diagonal cone hops Tuck jump Box jump (40cm) Double leg hops Double-Leg Butt Kick	2 X 12 4 X 6 2 X 12 3 X 8 2 X 12	Low Low Medium Medium High

Three sessions of plyometrics programme per week, were given to players in addition to their regular training. Pre-intervention and post-intervention jumping ability tests were conducted. Jumping ability was tested through approach jump reach and standing broad jump. As the game of basketball requires the jumping, aiming specially vertical height needed for block & attacking and horizontal distance in skills like jump & serve and back court attacking. Statistics used was basic descriptive analysis and paired sample “t” test.

Procedure of testing:

Approach jump reach were tested by keeping subjects to stand with one side towards a wall and take two three steps with arm swings and touch her finger marked with lime powder as high as possible nearest to the wall and scores were number of centimeters between approach jump reach and the ground level as the score. Three successive trails were given and the best trial was recorded as the score.

Standing Broad Jump was tested by keeping subjects stood behind a take off line with her feet parallel and several inches apart Measurement was taken as closest heel mark to the take-off line and scoring was as number of centimeter between the starting line and nearest heel, measured to the nearest full centimeter as score. Three successive trails were given and the best trial was recorded as the score.

RESULTS AND DISCUSSION

After the statistical analysis, the following results have been drawn:

Table-1: Pre-Test and Post-Test values of Mean, Standard Deviation (S.D.), Standard Error of Mean (S.E.M) of Jumping Ability (Standing Broad Jump) among Junior Men Basketball Players

Group	Number	Unit	Mean	S.D.	S.E.M.	't' Value
Standing Broad Jump (Pre-Test)	17	Centimeter	184.17	19.44	4.71	-14.51
Standing Broad Jump (Post-Test)	17	Centimeter	191.35	20.46	4.96	

df=16, .05 level of significant

Table-1 shows the pre-test and post-test mean ± standard deviation scores of standing broad jump of junior men basketball players was 184.17±20.46 and 191.35 ±19.44 respectively. It is interesting to see here that there is increase of 7.18 centimeter in mean scores of post test as a result of plyometrics intervention. The “t” value was -14.517 at .05 level of significant. The gain score of post test shows an improvement in standing broad jump ability among junior men basketball players.

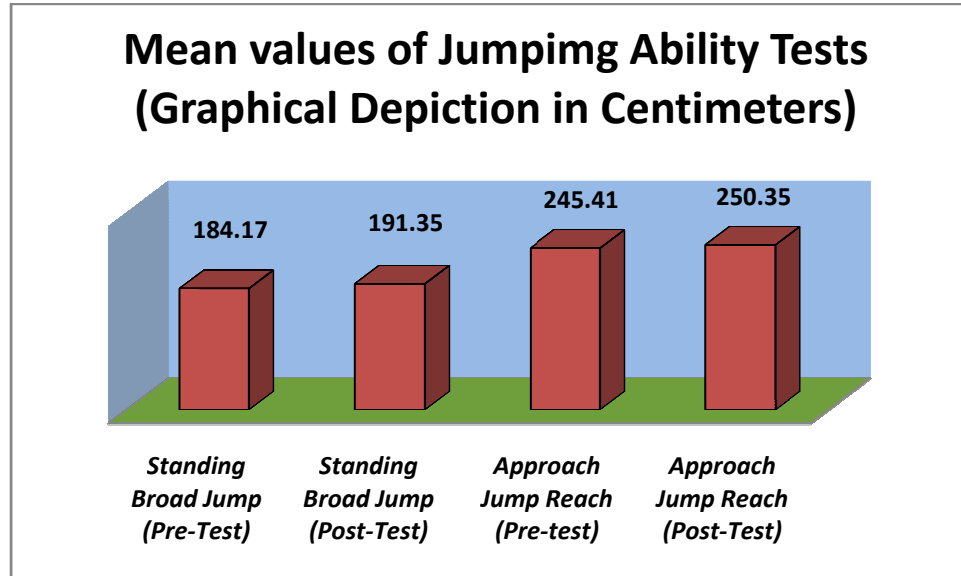
Table-2: Pre-Test and Post-Test values of Mean, Standard Deviation (S.D.), Standard Error of Mean (S.E.M) of Jumping Ability (Approach Jump Reach) among Junior Men Basketball Players

Group	Number	Unit	Mean	S.D.	S.E.M.	't' Value
Approach Jump Reach (Pre-Test)	17	Centimeter	245.41	6.69	1.62	-13.78
Approach Jump Reach (Post-Test)	17	Centimeter	250.35	7.35	1.78	

df=16, .05 level of significant

Table-2 shows the pre-test and post-test scores of mean ± standard deviation in Approach Jump Reach of junior men basketball players as 245.41±6.69 and 250.35±7.35 respectively. It is necessary to mention here that there is increase of 4.94 centimeter in mean scores, as a result of plyometrics intervention. The “t” value was --

13.78 at .05 level of significant. The depicted score of post - test shows an improvement in approach jump reach among junior men basketball players. Following graph conclude the graphical summary of mean scores among men basketball players jumping ability for better clarity:



DISCUSSION OF THE RESULTS:

The increase of 7.18 and 4.94 centimeter in mean scores of standing broad jump and approach jump reach respectively is a positive sign of plyometric training programme effectiveness. Hence it can be said that plyometric leads to improvement of jumping ability. Luebbers PE et al, (2003) who conducted a study effects of plyometric training and recovery on vertical jump performance and anaerobic power, also revealed plyometric effectiveness.

CONCLUSION:

The results of the study were cheering and reveal the benefit of plyometrics training programme on jumping ability of junior men basketball players. The jumping ability was enhanced as a result of intervening plyometrics training programme.

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