

Plyometric Exercises and Its Effect on The Leg Muscle Strength And Hand Strength Female College Basketball Players

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Abstract ;

The selected study "Plyometric Exercises and its effect on the Leg Muscle Strength and Hand Strength Female College Basket Ball Players". Objective was to study the effect of the plyometric exercises on the leg muscle strength and hand strength of the female college basket ball players. The scholar assessed that there is positive significant effect of plyometric training on female college basketball players, hence scholar hypothesized that the plyometric training improve the leg muscle strength and arm strength of the college female basket ball players. Total 30 female college students were selected for the study. Data were collected by Administrating leg muscles strength tests and Arm and shoulder muscle strength test before the start of plyometric training and after the finish of 5 weeks of plyometric training .by conducting 't' test and comparing calculated 't' value with tabulated 't' value that proved that calculated 't' value are greater than tabulated 't' value scholar concluded that there is positive significant effect on Leg Muscle Strength and Hand Strength of Female College Basket Ball Players.

Key words : Plyometric, Basketball , Leg muscle Strength, Hand Strength

Introduction:-

In sixties & seventies plyometric exercises are discovered and the players of other countries use plyometric exercises to improve the explosive power of muscles which are needed for month winning performance. Indian sport persons are not aware of these types of exercises and they do not use them to improve their physical fitness. Health related components of physical fitness include body composition, cardiovascular fitness, flexibility, explosive muscular power, endurance strength speed, quick reaction to execute the high level performance.

Plyometric is the exercise training designed to produce fast powerful movements and improves the functions of nervous system, generally for the purpose of improving performance in sports.

Objective: -

1. The main objective was to study the effect of the plyometric exercises on the leg muscle strength and hand strength of the female basket ball players.

Significance: - The scholar thought that if the plyometric training is positive then this training can be recommended for the players of various games to improve their physical fitness.

Hypothesis: - The scholar hypothesized that the plyometric training improve the leg muscle strength and arm strength of the female basket ball players

Delimitations: - This study was delimited to female basket ball players only the study was delimited to female college basket ball players 18 to 22 yrs. Study was delimited to plyometric exercises for 5 weeks duration.

Limitations of study:- The researcher limitations was that Researcher was not knowing socio-economic background of the basket ball player. Researcher did not know the basket ball players were doing any other type of exercise Researcher did not know the diet and the conditions of the players.

Methodology:- Scholar selected the female college basket ball player total number of subjects selected for the study were 30 Data were collected by Administrating leg muscles strength tests and Arm and shoulder muscle strength test before the start of plyometric training and after the finish of 5 weeks plyometric training.

All the required equipment for leg muscle strength and Arm and shoulder muscle strength test were used for administering the test. For hand and leg strength the two set of exercises were designed Lower body plyometric Exercises which include Cycled split squat jump, Hurdle hop, and Alternate leg bouncing, single leg speed hop. Upper body plyometric

Exercises Plyometric pushups, standing backward throw, Incline push up, depth throw, Overhead throw pass

Table no. 1 Mean standard deviation of leg muscle strength and arm strength scores of Female College students: (Pre-test scores).

Sr.No.	Leg and Arm strength variables	Mean	Standard deviation
1	Leg strength measured by leg dynamometer	10.53	0.35
2	Standing broad jump measured in distance	5.49	0.11
3	Standing vertical Jump measured by height reached	5.46	0.17
4	Hand grip strength measured by grip dynamometer	11.49	0.025
5	Flexed Arm Hand measured by timing of Hanging	4.67	0.17

Source: - From the actual scores recorded of strength variables

Discussion: -

The above table no. 1 reveals that before the start of the plyometric training for experimental group pre test of leg strength was measured by leg strength dynamometer and mean of scores was 10.53 and standard deviation was 0.35. The explosive strength of leg muscles was measured by standing broad jump the mean of score was 5.49 feet and standard deviation was 0.11. The explosive power was measured by standing vertical jump the mean of scores was 5.46 inches and standard deviation was 0.17. Hand grip was measured by Hand grip dynamometer. The mean of the score was 11.49 kg. and standard deviation was 0.025. The Arm and shoulder strength was measured by flexed arm hang test the mean was 4.67 minutes and standard deviation was 0.17.

After 5weeks training of plyometric exercises again the post-tests of strength variables were concluded and mean & standard deviation of scores were calculated which are given below in table no.2.

Table no. 2:- Mean and standard deviation of the scores of strength variable after 5 weeks plyometric training of college Female basket ball players.

Sr. no.	Strength variable	Post-test	
		mean	sd
1	Leg muscle strength measured by leg strength dynamometer	11.06	0.22
2	Standing broad jump explosive power of legs	6.23	0.055
3	Standing vertical jump explosive strength of legs	6.5	0.077
4	Hand grip strength measured by Hand grip Dynamometer	12.43	0.01
5	Flexed arm hang time Arm & shoulder muscle strength	8.1	0.56

Source: - From actual recorded strength variables scores.

Discussion: -

The above table number 5 reveals that the mean of the scores of leg muscle strength when measured by leg muscle dynamometer is 11.06 and standard deviation is 0.22. The explosive power of leg muscles when measured by standing broad jump mean of the scores is 6.23 and standard deviation is 0.055. The explosive power of leg muscles is also measured by standing vertical test and mean of the scores is 6.5 and standard deviation is 0.077. The Hand grip strength is measured by Hand grip dynamometer. The mean of the score is 12.43 and standard deviation is 0.01 the arm and shoulder strength is measured by flexed arm hang test the mean of flexed arm hang timing score is 8.10 and standard deviation is 0.56.

To see the effect 5 weeks plyometric training on the female basket ball player. ‘t’ value between pre-test score and post-test scores were calculated and compared with the tabulated ‘t’ value which is given below in the table number 3.

Table no. 3:- Pre-test and post-test scores mean and standard deviation and calculated value of ‘t’ and tabulated value of ‘t’ of Female Collage Basketball players.

S r. n o.	Strength variable	Pre- test		Post test		C al 't' ,	tab 't'
		m e a n	s t d	M e a n	s t d		
1	Leg muscle strength measured by leg strength dynamometer	10	0.35	11	0.26	6.94	2.6 at level of significance 0.01 and degree of freedom 29
		5	0.53	0	0.26	2	
2	Standing broad jump	52	0.59	65	0.35	42.7	
		2	0.93	2	0.55	7	
3	Standing vertical jump	54	0.67	65	0.37	35.5	
		4	0.67	1	0.57	5	
4	Hand grip strength	11	0.24	12	0.20	2.42	
		2	0.54	4	0.33	1	
5	Flexed arm hang	60	0.17	81	0.16	20.0	
		1	0.76	6	0.16	6	

Source:- From the pretest and post test scores of female college basketball players with calculated ‘t’ and tabulated ‘t’ values

Discussion:-

From the above table no.3 it indicates the pretest and post test means and standard deviation along with calculated ‘t’ and tabulated ‘t’ values at 0.01 level of significance and 29 is degree of freedom the calculated ‘t’ value of leg muscle strength is 6.94 where as the tabulated ‘t’ value is 2.6 . The calculated ‘t’ value of vertical jump is 42.7 where as the tabulated ‘t’ value is 2.6 . The

calculated ‘t’ value of hand grip strength is 24.2 where as the tabulated ‘t’ value is 2.6 and the calculated ‘t’ value of flexed arm hang is 20.0 where as the tabulated ‘t’ value is 2.6, hence it indicates that calculated ‘t’ values are higher than tabulated ‘t’ values at 0.01 level of significance and 29 is degree of freedom, therefore the hypothesis made by scholar is proved and accepted

Conclusion:-

The scholar Concluded that due to plyometric training the leg muscle strength and Hand muscle strength is improved of Female college Basket ball Players . Hence it is recommended that for players and athletes of schools and colleges plyometric exercises should be incorporated in physical Education program.

References

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