Online at: https://researchtrendsjournal.com
Indexed Journal

ISSN No: 2584-282X
Peer Reviewed Journal

INTERNATIONAL JOURNAL OF TRENDS IN EMERGING RESEARCH AND DEVELOPMENT

Volume 3; Issue 5; 2025; Page No. 62-65

Received: 05-06-2025
Accepted: 14-07-2025
Published: 08-09-2025

Impact of structured Training Interventions on Jumping ability and Flexibility in Basketball

[1]Dr. Aarif Majeed, [2]Kuldeep Kumar and [3]Darshan Kumar

[1]Assistant Professor, Guru Kashi University, Talwandi Sabo, Bathinda, Punjab, India

[2]Ph.D., Research Scholar, Department of Physical Education, Panjab University, Chandigarh, India

[3]Assistant Professor, Shaheed Udham Singh Government College, Sunam, Punjab, India

DOI: https://doi.org/10.5281/zenodo.17213528

Corresponding Author: Dr. Aarif Majeed

Abstract

The primary objective of this research was to explore the effects of selected physical exercises on the flexibility and vertical jump performance of basketball players. The study aimed to analyze how flexibility enhancing exercises influenced the players' range of motion, thereby potentially improving their execution of essential basketball movements. Additionally, the study examined the role of jump-focused exercises in enhancing athletes' ability to execute complex skills that demand precision, timing, coordination, and motor control. A comparative analysis of pre- and post-training flexibility and jumping ability was conducted to determine the effectiveness of the exercise regimen. Based on the outcomes, the research aimed to propose guidelines for integrating flexibility and jump-training exercises into routine basketball practice to boost performance and reduce the likelihood of injuries.

No significant improvement was observed from certain selected exercises on the flexibility and jumping ability of the basketball players. Participants were chosen from Guru Kashi University, and the study was limited to male athletes aged 18 to 25 years. A total of 60 players were selected using random sampling. The study was confined to the academic year 2023-2024 and 2024–2025. Data collection tools included the Sit and Reach Test for flexibility and Vertical Jump for Jumping, both administered before and after the training period. A t-test was used for statistical analysis at a 0.05 significance level. Results showed significant improvement in flexibility and jumping ability within the experimental group.

Keywords: Basketball players, Flexibility, Jumping and Specific training

Introduction

With the advancement of sports science, nations are striving to cultivate elite athletes capable of achieving success at international competitions. Considerable research is now focused on identifying predictive factors of high athletic performance, supported by appropriate training methodologies. These exercises, often termed explosive or power-driven exercises, are essential in modern athletic development.

Team sports, which involve more than two players per side such as football or handball require constant interaction and adaptation based on the opposition's gameplay. Even athletes from individual or dual sports may contribute to a team's cumulative score based on individual performance.

Basketball, a globally popular team sport, is ranked among the top competitive games in many nations. Core basketball skills include serving, receiving, and passing, all of which are crucial for enhancing overall gameplay. The sport offers extensive opportunities to develop attributes such as flexibility, speed, agility, power, reaction time, balance, muscular strength, endurance, and coordination. Recognizing the importance of leg and arm strength in basketball, the researcher chose to investigate how physical training influences players' flexibility and vertical jump

capabilities.

It was hypothesized that exercise interventions would lead to improvements in both flexibility and jumping ability. The study was limited to 30 male basketball players aged 18–25 years. Factors like motivational techniques, socio-economic background, and diet were not considered in the scope of this study.

Participants were selected from intercollegiate basketball players at Guru Kashi University using a simple random sampling method. The 30 selected athletes were equally divided into two matched groups based on their pre-test results: an Experimental Group and a Control Group. Flexibility and jumping ability were assessed using the Sit and Reach Test and the Vertical Jump Test, respectively, before and after the intervention. Statistical analysis revealed significant improvements in both parameters within the experimental group, supporting the original hypothesis.

Materils and Methods

The study employed a simple random experimental design. Based on baseline testing, participants were assigned to either an Experimental Group (Group A) or a Control Group (Group B). Group A underwent a specialized six-week (45-day) training regimen, while Group B maintained their usual physical activities without any additional intervention.

The training schedule for the Experimental Group consisted of sessions held six days a week in the evenings. Initially, sessions lasted for one hour per day, gradually increasing by 15-minute intervals every two weeks, ultimately reaching 90 minutes in the final phase. The control group continued with standard training routines, including recreational activities such as badminton.

Both groups performed a warm-up of 15–20 minutes prior to training sessions. The Experimental Group followed a structured, targeted training plan designed to enhance flexibility and vertical jump capacity.

Table 1: Week 1 and Week 6 Flexibility and Coordination Exercises

Days	Exercise	Set	Repetition	Set Rest
Monday To Saturday	1. Trunk Twisting	1 Min.	5	2 Min,
	2. Rope Skipping	1 Min.	5	2 Min.
	3. Shoulder and Chest Stretch	1 Min.	5	2 Min.
	4. Zig-Zag Running	1 Min.	5	2 Min.
	5. Alternative Toe Touch	1 Min.	5	2 Min.
	6. Hip Stretch	1 Min.	5	2 Min.
	7. Hamstring stretch	1 Min.	5	2 Min.

To evaluate the impact of a training program on flexibility and jumping performance in basketball players, the t-test statistical technique was employed. The hypothesis was examined at a 5% level of significance. The data for this research was gathered from 30 basketball players from the Department of Physical Education, Guru Kashi University, Talwandi Sabo, Bathinda, Punjab. Assessments were conducted using the Sit and Reach test for flexibility and the Vertical Jump test for jumping ability. Baseline (pre-test) measurements were taken prior to the implementation of the training program, and follow-up (post-test) data was recorded immediately after the completion of the program.

Table 2: Pre and Post-test of Flexibility of Experimental Group (Sit and Reach Test)

Group	Mean	S.D	M.D	T test
Pre-test	17.27	1.87	5.86	4.75
Post-test	23.13	3.56		

Interpretation

Observed t-value (4.75) exceeds tabulated value (2.14), indicating a statistically significant improvement in flexibility due to the training program.

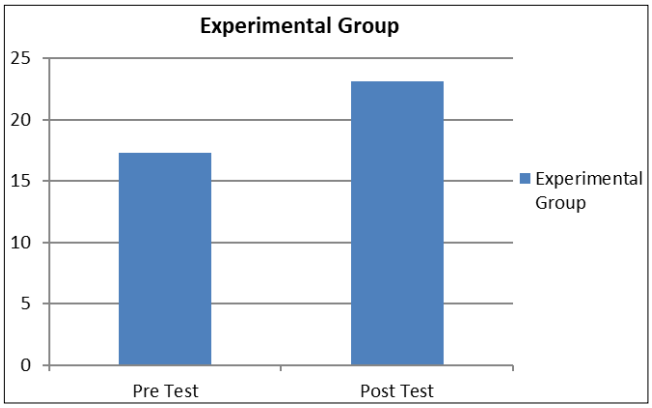

Fig 1: Graphical representation of Pre and Post-test of Flexibility of Experimental Group (Sit and Reach Test)

Table 3: Pre-test and post-test of control group sit and reach (Flexibility)

Group	Mean	S.D.	M.D.	t-value
Pre-test	18.07	1.91	0.53	0.59
Post-test	18.6	3.27		

Interpretation: Calculated t-value (0.59) is below the critical value (2.14), suggesting no significant change in flexibility.

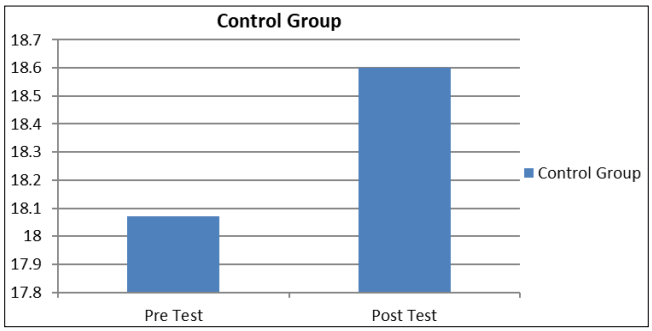

Fig 2: Graphical representation of Pre-test and Post-test of Control Group Sit and Reach Test (Flexibility)

Table 4: Comparison of Post-test Scores Between Experimental and Control Groups (Sit and Reach Test)

Group	Mean	S.D.	M.D.	t-value
Control	18.6	3.56	4.53	9.31
Experimental	23.13	3.27		

Interpretation: The significant t-value (9.31 > 2.05) confirms a notable improvement in flexibility among the experimental group compared to the control group.

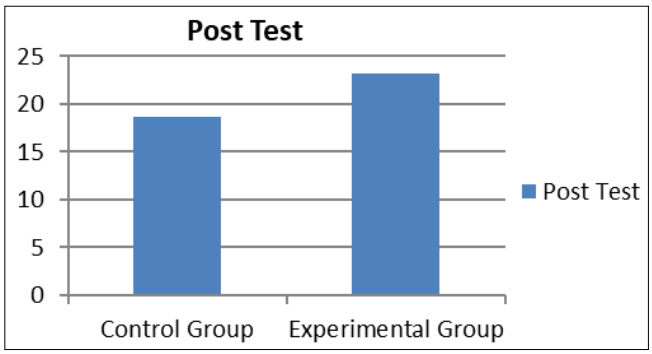

Fig 3: Graphical representations of Post-test Scores between Experimental and Control Groups (Sit and Reach Test)

Table 5: Pre-test and Post-test of Experimental Group Vertical Jump

Group	Mean	S.D.	M.D.	t-value
Pre-test	30.25	1.28	1.11	0.072*
Post-test	29.14	1.92		

No meaningful improvement in coordination was observed after training.

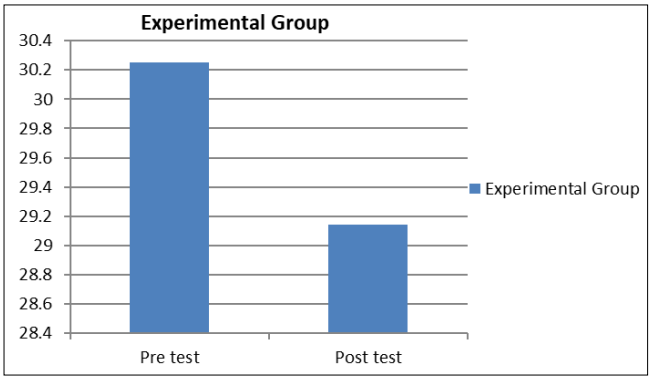

Fig 4: Graphical representations of Pre-test and Post-test Experimental Group Vertical Jump

Table 6: Difference between Pre-test and Post-test of Control Group Vertical Jump

Group	Mean	S.D.	M.D.	t-value
Pre-test	29.62	1.89	0.82	0.26*
Post-test	28.81	2.01		

Interpretation: No significant change in coordination was found.

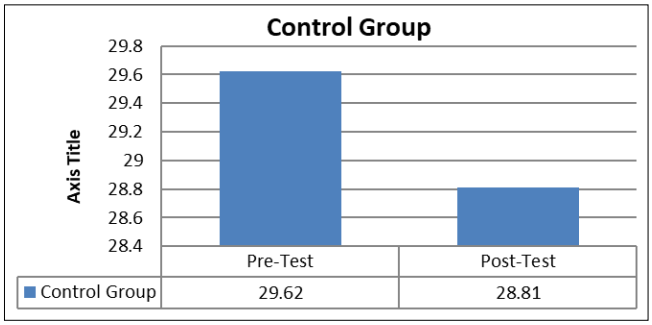

Fig 5: Graphical representations of Pre-test and Post-test Control Group Vertical Jump

Table 7: Post-test Comparison Between Control and Experimental Groups Vertical Jump

Group	Mean	S.D.	M.D	t-value
Control	28.81	2.01	0.33	0.65
Experimental	29.14	1.92		

Interpretation: The post-test vertical jump scores show no significant difference between the two groups.

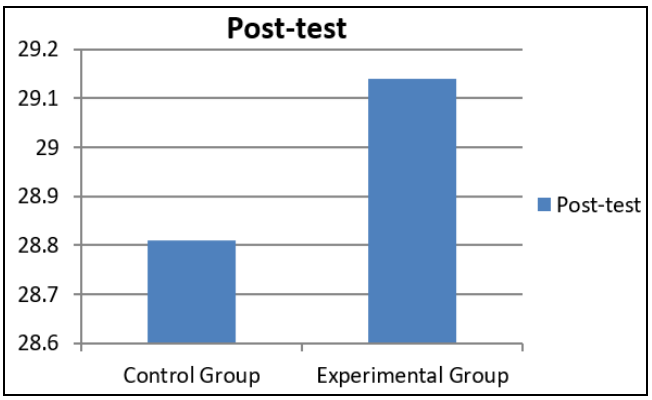

Fig 6: Graphical representations of Post-test Control Group and Experimental Group Vertical Jump

These findings suggest that the selected exercise program was effective in enhancing flexibility and jumping ability, possibly due to the specific nature of exercises chosen.

Findings

The hypothesis stating that selected exercises would enhance flexibility in basketball players is accepted, as statistical evidence supports this. The hypothesis that selected exercises would improve jumping ability is accepted, as significant changes were observed.

Conclusions

The selected exercises significantly enhanced flexibility in basketball players.

The experimental group showed marked improvement in flexibility due to the training program.
The selected exercises should improve jumping ability.
The experimental group showed significant improvement in jumping ability.
Coaches and trainers aiming to enhance flexibility in basketball players may incorporate the exercise methods used in this study.
Future studies could explore variations in age, gender, and athletic level.
Repetition of this study with a larger sample size is advised to enhance validity and generalizability.

References

1. Uppal AK, Singh R. Effect of eight-week participation in physical education and conditioning programmes on flexibility. Journal of Physical Education. 1985;8-11.
2. Brown H, Joseph F. The effect of physical education on soccer class and a wrestling class upon static balance and flexibility. Completed Research in Health Physical Education and Recreation. 1961;11:115.
3. Murray E. The effect of warm-up, static stretching and dynamic stretching on hamstring flexibility in previously injured subjects. BMC Musculoskeletal Disorders. 2009;11:31-37.
4. Aruna G, *et al*. Effect of high and low flexibility on agility, acceleration speed and vertical jump performance of basketball players. European Journal of Physical Education and Sport Science. 2021;6(11).
5. Sharadrao H. Foundation of Physical Education. New Delhi: Sports Publication; c2009. p. 56.
6. Morton SK. Resistance training vs. static stretching: Effects on flexibility and strength. Journal of Strength and Conditioning Research. 2011;25(12):3391-3398.
7. Samoa. The influence of strength, flexibility, and simultaneous training on flexibility and strength gains. Journal of Strength and Conditioning Research. 2011;25(5):1333-1338.
8. Aarif M. Effect of selected plyometric training on arm and leg strength of volleyball players. International Journal of Health, Physical Education and Computer Science in Sports. 2021;43(1):34-36.
9. Aarif M, Ahmad BM. Effect of circuit training on motor fitness components and skill ability of Kabaddi players. International Journal of Psychosocial Rehabilitation. 2019;23(6):1896-1902.
10. Aarif M. Effect of selected exercise on reaction time and agility of athlete and non-athlete: A comparative study. Ajanta. 2020;9(4):95-102.
11. Aarif M, Shahid MUD. Influence of six weeks of weight training on volleyball players strength and muscular endurance. International Journal of Research Publication and Reviews. 2025;6(9):161-166.
12. American College of Sports Medicine. American College of Sports Medicine position stand on progression models in resistance training for healthy adults. Medicine and Science in Sports and Exercise. 2002;34(2):364-380.
13. Ibrahim AAL. The impact of weight training on the defensive performances for the sitting volleyball players (amputees). World Journal of Sport Sciences. 2010;3:1146-1150.
14. Ballor DL, Katch VL, Becque MD, Marks CR. Resistance weight training during caloric restriction enhances lean body weight maintenance. American Journal of Clinical Nutrition. 1988;47(1):19-25.
15. Smith DJ, Stokes S, Kilb B. Effects of resistance training on isokinetic and volleyball performance measures. Journal of Applied Sport Science Research. 1987;1(3):23-25.
16. Meirelles DM, Gomes C. Acute effects of resistance exercise on energy expenditure: revisiting the impact of the training variables. Revista Brasileira de Medicina do Esporte. 2008;10:131-138.
17. Hanson ED, Srivatsan SR, Agrawal S, Menon KS, Delmonico MJ. Effects of strength training on physical function: Influence of power, strength and body composition. Journal of Strength and Conditioning Research. 2009;23(9):2627-2637.
18. Manna I, Khanna GL, Dhara PC. Effect of training on anthropometric, physiological and biochemical variables of U-19 volleyball players. Journal of Human Sport and Exercise. 2012;7(1).
19. Azeem K, Ameer A. Effect of weight training on sprinting performance, flexibility and strength. British Journal of Sports Medicine. 2010;44(Suppl 1):i22.
20. Sheehy KM. The acute effects of weight training on softball throwing velocity [Master's thesis]. Auckland: AUT University; c2006.
21. Sanborn K, Boros R, Hruby J, Schilling B, Johnson R, Hoke T. Short-term performance effects of weight training with multiple sets not to failure vs. a single set to failure in women. Journal of Strength and Conditioning Research. 2000;14(3):328-331.
22. Sindu LK, Mall NM. Modern Perspective on Physical Education and Sports Science. New Delhi: Haram Publication; c1986. p. 1.
23. Torres-Ronda L, Sánchez-Medina L, González-Badillo JJ. Muscle strength and golf performance: A critical review. Journal of Sports Science and Medicine. 2011;10:9-18.
24. Shavandi N, Hoseini RS. The effect of progressive endurance-strength training and electrical stimulation on muscle strength and surface electromyography parameters in volleyball players with infraspinatus syndrome. British Journal of Sports Medicine. 2011;45(6):548-549.
25. Nakamura H, Naito S, Hiraoka Y, Mimura K. The effect of resistance training on volleyball players. Memoirs of Osaka Kyoiku University. Series 4: Education, Psychology, Special Education and Physical Culture. 2005;54(1):23-32.
26. Stojanovic T, Kosti R. The effects of the plyometric sport training model on the development of the vertical jump of volleyball players. Physical Education and Sport. 2002;1(9):11-25.