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The impact of Pilates training on flexibility and dynamic balance in basketball players

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Abstract

This study investigated the impact of a 12-week Pilates training program on flexibility and dynamic balance in college-level basketball players. 40 players were divided into two groups: An experimental group that underwent Pilates training and a control group that continued their regular routine. Pilates sessions occurred three times a week for 60 minutes each, focusing on core strength, controlled movements, and precise alignment. The program began with 65% workload and gradually increased to 85% over the 12 weeks. Flexibility was measured using the sit-and-reach test, while dynamic balance was assessed using the modified Bass test. Both metrics were measured before and after the training program. Results showed significant improvements in both flexibility and dynamic balance for the Pilates group compared to the control group. This suggests that Pilates training can be an effective tool for basketball players to enhance their movement capabilities and potentially gain a competitive edge. The study highlights the potential benefits of Pilates for athletes seeking to improve flexibility, dynamic balance, and overall performance. Incorporating Pilates into training regimens can contribute to greater agility, control, and injury prevention on the court.

Keywords: Pilates training, flexibility and dynamic balance.

Introduction

In the demanding world of basketball, where agility, flexibility, and dynamic balance are crucial, players constantly seek methods to enhance their physical prowess. Recognizing the multifaceted nature of the game, athletes and coaches are increasingly turning to holistic training methods like Pilates to complement traditional regimens. This article explores the potential impact of Pilates on flexibility and dynamic balance in basketball players, examining the scientific underpinnings, specific exercises, and broader implications for on-court performance and injury prevention.

Basketball demands a unique blend of physical attributes, requiring players to constantly change direction, leap for rebounds, and contort their bodies for daring shots, all while maintaining control and avoiding injury. To excel, players need training beyond traditional weightlifting and drills. Pilates, a mind-body exercise system characterized by its focus on core strength, controlled movements, and precise alignment, offers numerous benefits that can directly improve on-court performance. Understanding these advantages can help players and coaches incorporate Pilates into their regimen, unlocking a new level of skill and resilience. Flexibility is crucial for basketball players, enabling a wider range of motion, powerful jumps, and quick recovery from directional changes. Pilates training emphasizes gentle stretching, targeting major muscle groups involved in basketball movements, and improves the range of motion in the hamstrings, quads, hips, shoulders, and spine, enhancing fluidity and ease of movement on the court. Dynamic balance is equally crucial, ensuring stability during movements, agility drills, and jumps. Poor balance can result in missed shots and turnovers. Pilates exercises, focusing on the core and proprioceptive system, enhance body awareness and reaction speed. They are often performed on unstable surfaces to improve stability in dynamic movements. By incorporating Pilates into their training regimen, basketball players can gain a competitive edge, enhancing their flexibility, dynamic balance, and overall performance on the court.

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Methodology

The study aimed to investigate the impact of Pilates training on flexibility and dynamic balance in college-level basketball players aged 18 to 25. They were divided into two equal groups of twenty such as Experimental group I underwent N (20) Pilates training (PT) for a period of twelve weeks, and group II N (20) acted as control group (CG) and not exposed to any specific training, but they participated in their regular schedule. Flexibility and dynamic balance were selected as variables and assessed using the "sit and reach test" (measured in centimeters), the "modified bass test" (measured

in numbers) respectively. The parameters were measured at baseline to post-treatment after the twelve weeks. Pilates sessions were conducted three times a week for 60 minutes each, including 10 minutes of warm-up, 40 minutes of Pilates training, and 10 minutes of cool-down for twelve weeks. The training intensity increased by 10% every four weeks, ranging from 65% to 85% of workload. Statistical analysis using the 't' test was performed to determine significant improvements between pre and post-tests, with a criterion for significance set at a 0.05 confidence level.

Results

Table 1: Computation of 'T' ratio on selected variables on basketball players for experimental group and control group.

| Group | Variables | Mean | N | Std. Deviation | Std. Error Mean | 'T' Ratio | |
|--------------------|-----------------|-----------|-------|----------------|-----------------|-----------|--------|
| Experimental Group | Flexibility | Pre test | 30.75 | 20 | 2.88 | 0.30 | 11.896 |
| | | Post test | 34.35 | 20 | 3.01 | | |
| | Dynamic Balance | Pre test | 5.80 | 20 | 1.57 | 0.15 | 7.712 |
| | | Post test | 7.00 | 20 | 1.71 | | |
| Control Group | Flexibility | Pre test | 29.20 | 20 | 2.70 | 0.19 | 4.344 |
| | | Post test | 30.05 | 20 | 2.74 | | |
| | Dynamic Balance | Pre test | 5.60 | 20 | 1.46 | 0.16 | 1.561 |
| | | Post test | 5.85 | 20 | 0.98 | | |

*Significant level 0.05 level of degree of freedom (2.09, 1 and 19)

Table I presents mean, standard deviation, and 't' ratios for flexibility and dynamic balance in the experimental group. 't' ratios of 11.896 and 7.712 were obtained for flexibility and dynamic balance, surpassing the critical table value of 2.09 for degrees of freedom 1 and 19 at the 0.05 significance level, confirming statistical significance. In contrast, the control group analysis involved 't' ratio calculations for flexibility and

dynamic balance, resulting in 't' ratios of 4.344 and 1.561. At the 0.05 significance level, the required table value of 2.09 for degrees of freedom 1 and 19 indicated that these 't' values were not statistically significant. This comparison underscores the statistical significance of Pilates training in enhancing fitness parameters in the experimental group compared to the control group.

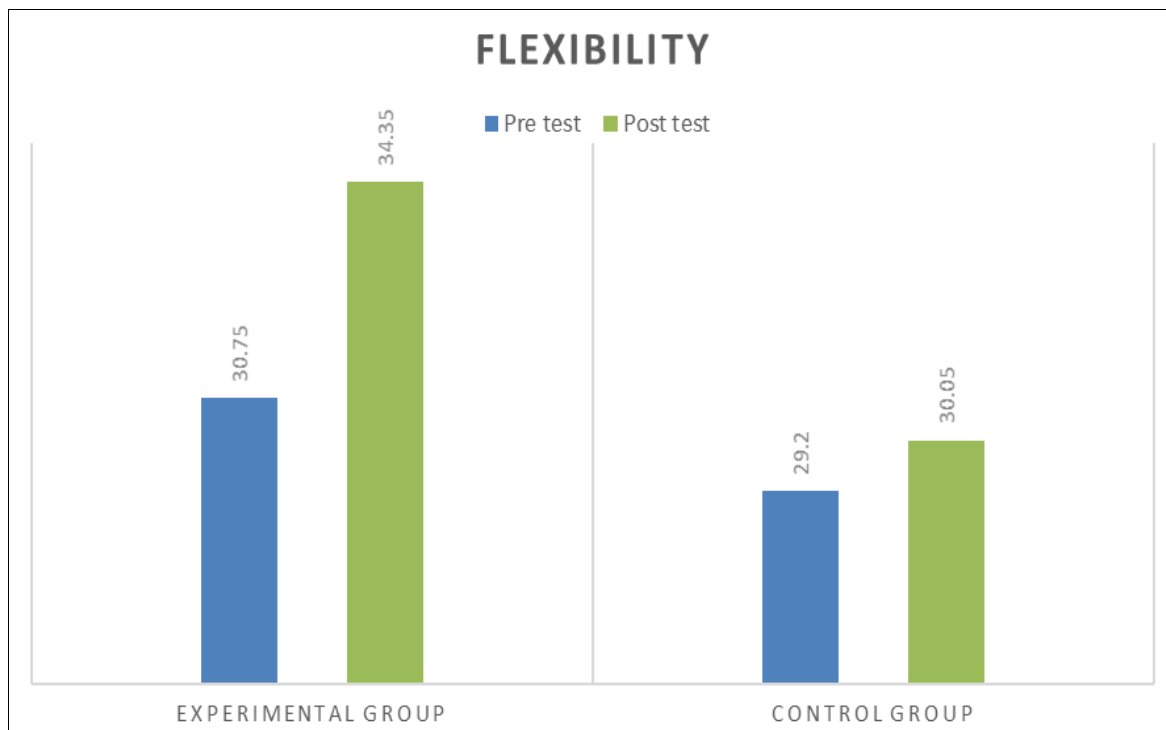


Fig 1: Bar diagram showing experimental group and control group of basketball players on flexibility

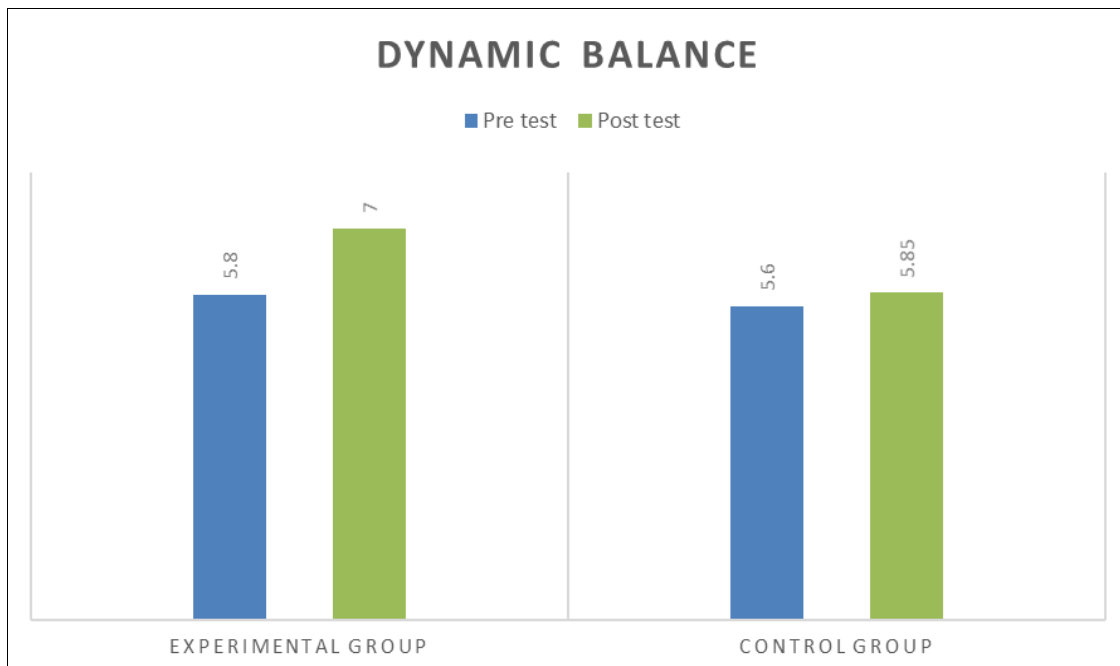


Fig 2: Bar diagram showing experimental group and control group of basketball players on explosive power

Discussion on findings

The present experiment study was to find out the impact of Pilates training flexibility and dynamic balance in basketball players after a twelve-week program. Pilates training enhances flexibility and dynamic balance through controlled, flowing movements engaging various muscle groups. It primarily stretches hamstrings, lower back (Erector Spinae), and involves calves and hip muscles. These stretches, promoting suppleness and range of motion, align with Pilates principles, emphasizing safe and effective flexibility enhancement for overall musculoskeletal health. Dynamic balance, essential for stability during movement, is honed through Pilates coordinated exercises, engaging core muscles like the transverse abdominis and pelvic floor. The result of the present study indicated that the Pilates training practices improved the variables such as flexibility and dynamic balance. The findings of the present study had similarity with the findings of the investigations referred in this study. Pilates method behaved as a useful tool in the increase of flexibility of athletes highly prone to decrease of this condition (F Bertolla *et al.*, 2007) [1]. The Pilates method of exercise has been improved the flexibility and dynamic balance of the healthy peoples. The research indicate that Pilates core stability training enhances motor performance skills by increasing lower extremity muscle strength and improving postural stability and prevent musculoskeletal disorders and improve quality of life (Yu, Jae-Ho *et al.*, 2012) [2]. Teamwork suggests that athletes can improve their muscular endurance, flexibility and individual basics of service and smash using Pilates exercises that do not require equipment or a high degree of skill and easy to master and use within a personal fitness routine (P Montesano *et al.*, 2018). Preeti *et al.*, (2019) [3]. Effect of pilates on lower limb strength, dynamic balance, agility, and coordination skills in aspiring state level badminton players; The result show that Pilates is an effective method for improvement in lower limb strength, agility, dynamic balance and coordination skills in badminton players. The Pilates shows improvement on balance in Basketball Players (Panse *et al.*, 2018) [7]. Pilates core stability exercises improves balance abilities of archers.

Conclusion

Twelve weeks of Pilates training demonstrably enhanced both flexibility and dynamic balance in basketball players, with the Pilates group exhibiting significant improvements compared to the control group. This suggests that Pilates offers a valuable training tool for basketball players seeking to optimize their movement capabilities and potentially gain a competitive edge.

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