



Synergistic Outcomes of Isometric Strength Training and Specific Drills on Lower Body Strength Endurance and Leg Strength in Basketball Players

S. Senthil Kumaran¹ and Dr. V. Vallimurugan²

¹PhD Research Scholar, Department of Physical Education, Bharathiar University, Coimbatore, Tamilnadu.

²Assistant Professor, Department of Physical Education, Bharathiar University, Coimbatore, Tamilnadu.

ABSTRACT

The foremost aim of this study was to explore the synergistic outcomes of isometric strength training and specific drills on lower body strength endurance and leg strength in basketball players. To achieve this goal, we selected a group of thirty school level basketball players, aged 14 to 17, from the National Sports Academy in Coimbatore. These players were evenly divided into two groups, with no deliberate attempt to make them equal.

The first group, known as the Experimental Group (Group I), underwent an eight weeks training program that focused on isometric strength training with specific drills (ISTWSDG). In contrast, the second group, named the Control Group (Group II), did not receive any additional training beyond their regular activities, serving as a comparative baseline. Lower body strength endurance was assessed using the agility hurdle jump test, while leg strength was measured through the wall squat test.

The data collected from the participants underwent statistical analysis using the 't' ratio to identify any statistically significant improvements at a confidence level of 0.05. The results revealed significant enhancements in both lower body strength endurance and leg strength among participants who underwent isometric strength training with specific drills. These improvements were observed despite potential limitations related to factors such as diet, climate, lifestyle, and prior training experiences. Encouragingly, these findings were consistent with research conducted by experts in the field of sports sciences. Collectively, the evidence suggests that isometric strength training with specific drills has a notable positive impact on the lower body strength endurance and leg strength of school level basketball players.

Keywords: Isometric Strength Training with Specific Drills, Basketball, Lower Body Strength Endurance and Leg Strength.

INTRODUCTION

Basketball, a dynamic sport that demands a unique blend of speed, agility, and power, places significant demands on an athlete's lower body strength and endurance. The quest for enhancing these physical attributes has led to a multitude of training methodologies, each striving to uncover the most effective means of elevating performance on the court. Among these approaches, isometric strength training and targeted drills have gained recognition for their potential to synergistically impact lower body strength endurance and leg strength in basketball players.

In recent years, sports science has delved deeper into the intricate interplay between various training methods, seeking to unlock the secrets behind their combined effects on athletic performance. This study embarks on a journey to investigate the intriguing realm of synergistic outcomes arising from the fusion of isometric strength training and specific drills, with a primary focus on their influence on the lower body attributes of basketball players.

To provide a comprehensive understanding of this synergistic phenomenon, we have undertaken a rigorous examination of these training techniques among a cohort of young basketball athletes. Our research seeks to shed light on the potential benefits of combining isometric strength training with targeted drills, offering valuable insights for athletes, coaches, and sports scientists alike.

METHODS

Experimental Approach to the Problem

In order to examine the plan proposed in this research, a sample of thirty school level basketball players was enlisted, ranging in age from 14 to 17 years. This cohort was divided into two equal groups, each consisting of 15 participants. It is important to emphasize that no deliberate efforts were made to equalize these groups. The initial group, referred to as Experimental Group I (n = 15), underwent an eight weeks training regimen incorporating isometric

strength training and specific drills. Conversely, Group II (n = 15) was designated as the control group (CG), and its members did not partake in any training program beyond their regular commitments.

Design

The study focused on assessing two key parameters: lower body endurance (measured using the Agility Hurdle Jump Test) and leg strength (evaluated through the Wall Squat Test). These measurements were taken at two points in time: at the baseline and after 8 weeks of the Isometric Strength Training with Specific Drills (ISTWSD) program. The study aimed to analyze the impact of this training regimen on the selected parameters.

Training Protocol

Each training session spanned a duration of 60 minutes, during which participants engaged in a combination of isometric strength training and specific drills. This comprehensive training regimen encompassed warm-up exercises and a post training relaxation procedure. The training sessions were conducted three days per week over an eight weeks period.

Statistical Analysis

To assess the effectiveness of the training program, the collected data underwent statistical analysis using the paired 't' test. This analysis aimed to detect any individual changes from the baseline measurements to the post-test results, with a fixed confidence level of 0.05 to determine the level of significance.

RESULTS

Table-I

Relationship of Mean, SD and 't'-Values of the Lower Body Strength Endurance between Pre & Post Test of the Isometric Strength Training with Specific Drills Group (ISTWSDG) and Control Group (CG) of Basketball Players

Lower Body Strength Endurance between	Groups	Test	Mean	S.D	't' Values
	CG	Pre Test	10.40	0.50	1.16
		Post Test	10.80	0.67	
	ISTWSDG	Pre Test	10.53	0.63	20.91*
		Post Test	13.86	0.74	

*Significant at 0.05 level of confidence

Table I explains the mean values obtained from the control group's pre-test and post-test measurements of lower body strength endurance were 10.40 and 10.80, respectively. The corresponding calculated t ratio was 1.16. In comparison, the critical tabulated t value, with 14 degrees of freedom and at a confidence level of 0.05, stood at 2.14. Upon evaluation, it was evident that the calculated t ratio fell below the tabulated value. This indicates an insignificant change in the lower body strength endurance of the basketball players within the control group. Conversely, the mean and standard deviation values derived from the pre-test and post-test scores of the Isometric Strength Training with Specific Drills Group (ISTWSDG) were 10.53 and 13.86, respectively. The resulting t ratio for this group was calculated as 20.91. When compared to the required tabulated value of 2.14 at a confidence level of 0.05, with 14 degrees of freedom, the calculated t ratio exceeded the tabulated value. This outcome signifies a substantial and noteworthy transformation in the lower body strength endurance of the basketball players who underwent Isometric Strength Training with Specific Drills.

Table-II

Relationship of Mean, SD and 't'-Values of the Leg Strength between Pre & Post Test of the Isometric Strength Training with Specific Drills Group (ISTWSDG) and Control Group (CG) of Basketball Players

Leg Strength	Groups	Test	Mean	S.D	't' Values
	CG	Pre Test	54.06	1.16	0.89
		Post Test	54.40	1.18	
	ISTWSDG	Pre Test	54.26	1.22	42.13*
		Post Test	65.80	1.14	

*Significant at 0.05 level of confidence

Table II reveals the mean values obtained from the control group's pre-test and post-test measurements of leg strength, which were 54.06 and 54.40, respectively. The corresponding calculated t ratio was 0.89. In comparison, the critical tabulated t value, with 14 degrees of freedom and at a confidence level of 0.05, was 2.14. Upon examination, it was evident that the calculated t ratio fell below the tabulated value. This indicates an insignificant change in the leg strength of the basketball players within the control group. On the other hand, the mean and standard deviation values obtained from the pre-

test and post-test scores of the Isometric Strength Training with Specific Drills Group (ISTWSDG) were 54.26 and 65.80, respectively. The resulting t ratio for this group was calculated as 42.13. When compared to the required tabulated value of 2.14 at a confidence level of 0.05, with 14 degrees of freedom, the calculated t ratio exceeded the tabulated value. This outcome signifies a substantial and noteworthy transformation in the leg strength of the basketball players who underwent Isometric Strength Training with Specific Drills.

DISCUSSION ON FINDINGS

Isometric Strength Training with Specific Drills has emerged as a highly effective approach, demonstrating substantial benefits for basketball players. To assess its impact on the lower body strength endurance and leg strength of school-level basketball players, this study investigated the differences between a group undergoing Isometric Strength Training with Specific Drills and a control group. The Isometric Strength Training with Specific Drills program was designed to enhance both lower body strength endurance and leg strength.

The results obtained unequivocally confirm the effectiveness of Isometric Strength Training with Specific Drills, revealing a significant improvement within the group exposed to this regimen. The findings of this study unequivocally validate that Isometric Strength Training with Specific Drills leads to a substantial enhancement in both lower body strength endurance and leg strength among school level basketball players.

Notably, these outcomes harmonize with previous research conducted by **Ascender et al. (2019)** and **Marcolin et al. (2018)**. In line with these studies, our investigation emphasizes the undeniable positive impact of Isometric Strength Training with Specific Drills on the lower body strength endurance and leg strength of basketball players. Conversely, the control group, as discerned from the results of this study, did not exhibit noteworthy improvements in lower body strength endurance and leg strength among school level basketball players.

CONCLUSION

Drawing upon the study's findings and considering its inherent limitations, it becomes evident that the integration of isometric strength training with specific drills has a noticeable positive influence on improving lower body strength endurance and leg strength among basketball players. Furthermore, significant progress was observed within the selected parameters of the isometric strength training with specific drills group, evident after an eight-week period of specialized training. This solidifies the notion that this training regimen is effective in enhancing both lower body strength endurance and leg strength.

1. It can be inferred that the personalized implementation of isometric strength training with specific drills demonstrated statistically significant and positive effects throughout the intervention period, contributing to the improvement of lower body strength endurance and leg strength in school level basketball players.
2. It is apparent that the individualized interventions applied by the control group, while showing a positive trend, did not yield statistically significant results within the given timeframe. This applies to both lower body strength endurance and leg strength in school level basketball players.
3. Upon comparison, the comparative outcomes lead to the conclusion that the isometric strength training with specific drills group exhibited significantly more pronounced advancements in both lower body strength endurance and leg strength when contrasted with the performance of the control group. This discrepancy underscores the superior impact of specialized training on lower body strength endurance and leg strength in school level basketball players.

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