OPEN ACCESS

Journal of Advances in Sports and Physical Education
Abbreviated Key Title: J Adv Sport Phys Edu
ISSN 2616-8642 (Print) |ISSN 2617-3905 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Impact of Yoga and Pilates Training on Flexibility, Balance, Core Strength, and Agility among School Badminton Athletes

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DOI: https://doi.org/10.36348/jaspe.2026.v09i06.005 | **Received:** 17.04.2026 | **Accepted:** 13.06.2026 | **Published:** 25.06.2026

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Abstract

This study aims to examine the impact of 6 weeks Yoga and Pilates training programme on selected physical fitness variables of school badminton athletes. 30 school level badminton athletes aged 13 to 16 years were randomly selected into 2 groups. An experimental group (n = 15) will be undergoing yoga and pilates training and a control group (n = 15) underwent there regular physical training programme. Experimental and control group underwent the training for 6 weeks, 5 days per week. The selected physical fitness variables are flexibility, balance, core strength, and agility which is examined using standardized test (Johnson & Nelson, 1986; Davis et al.,2000). Bothe the group underwent the standardized test a pre-test and post-test data were collected. Analysis of covariance (ANCOVA) was employed to determine the significant differences between the groups at a 0.05 level of significance. The study resulted a significant improvement in flexibility, balance, core strength, and agility of the experimental group than the control group. The study findings indicate that integration of yoga and pilates into badminton training programmes can effectively enhance physical fitness components essential for school-level badminton performance.

Keywords: Yoga training, Pilates training, Badminton players, School students, Physical fitness.

INTRODUCTION

Badminton is a speed racket sport that needs high level of agility, balance, flexibility, core strength, coordination, and fast change of directions (Phomsoupha & Laffaye, 2015; Sheppard & Young, 2006). In the school level badminton athletes often come across the physical limitations due to inadequate conditioning, early sports choosing, insufficient fitness development and holistic development (Malina *et al.,* 2015). General badminton training programmes mainly focuses on technical skill development.

Yoga and pilates are system that trains the body and mind that develops postural control, flexibility, core stability, breathing and movement (Cowen & Adams, 2005; Sekendiz *et al.,* 2007). Regular yogic practice develops mobility of the joints, flexibility of the muscles, balance, and neuromuscular coordination while also enhance psychological relaxation and injury prevention (Tran *et al.,* 2001; Ross & Thomas, 2010). Pilates training aims on core muscles strengthening, muscular endurance, and enhances the movement patterns, which are important for the badminton performance (Kloubec, 2010; Wells *et al.,* 2012).

The earlier studies have recorded positive effect of yoga and pilates training on physical fitness variables between school badminton athletes (Sekendiz *et al.,* 2007; Sharma *et al.,* 2016; Kucuk & Livanelioglu, 2015). However, study is there regarding the combined application of yoga and pilates training specifically among school level badminton athletes. Therefore, the present study was designed to investigate the effectiveness of a six-week yoga and pilates training on selected physical fitness variables of school badminton athletes.

The purpose of this study was to intercept the effect of six-week yoga and pilates training programme on selected physical fitness variables of school badminton athletes. Badminton performance at the school level requires well developed flexibility, balance, core strength, and agility. These are important for pro movement execution, postural stability, prevention of injury (Phomsoupha & Laffaye, 2015; Sheppard & Young, 2006). Yoga and pilates have been reported to builds musculoskeletal fitness and postural corrections, and neuromuscular development in the badminton athletes (Cowen & Adams, 2005; Sekendiz *et al.,* 2007;

Kloubec, 2010), the studies regarding their combined influence on school level badminton athletes remains limited. Therefore, the study focuses on effectiveness of yoga and pilates training on flexibility, balance, core strength, and agility between school badminton athletes. It was hypothesized that athletes in a structured yoga and pilates training programme would result in significant improvement in flexibility, balance, core strength, and agility when experimental group compared to a control group undergo regular badminton training.

Experimental Section

The study employed a randomized pre-test and post-test control group experimental design (Thomas *et al.,* 2015). Thirty male school-level badminton players aged between 13 and 16 years were selected randomly from a school badminton training centre and were randomly assigned into two groups: an experimental group that underwent Yoga and Pilates training (n = 15) and a control group (n = 15). The experimental group participated in a structured Yoga and Pilates training programme for a duration of six weeks, with a training frequency of five days per week and each session lasting approximately 45–60 minutes. The training programme was designed based on progressive overload principles to ensure gradual adaptation and improvement (Bompa & Buzzichelli, 2019). The Yoga component of the programme included Surya Namaskar, Tadasana, Vrikshasana, Trikonasana, Bhujangasana, Paschimottanasana, which were chosen for their effectiveness in enhancing flexibility, balance, and neuromuscular control (Tran *et al.,* 2001; Sharma *et al.,* 2016). The Pilates component comprised exercises such as Hundred, Roll-Up, Single-Leg Stretch, Double-Leg Stretch, Plank, Side Kick, and Spine Stretch, which were incorporated to improve core strength and postural stability (Sekendiz *et al.,* 2007; Kloubec, 2010).

Table I: Variables and Test

Variable	Test
Flexibility	Sit and Reach Test (Johnson & Nelson, 1986)
Balance	Stork Stand Test (Johnson & Nelson, 1986)
Core Strength	Plank Hold Test (McGill, 2010)
Agility	Shuttle Run Test (Davis *et al.,* 2000)

Analysis of Covariance (ANCOVA) was used to determine significant differences between the experimental and control groups by adjusting the pre-test scores (Keppel & Wickens, 2004).

The level of significance was set at 0.05. Whenever the adjusted ‘F’ value was found significant, Scheffe’s post-hoc test was applied.

Table II: Test Result

Variable	Group	Pre Test Mean	Post-Test Mean	Adjusted Post-Test Mean	E-value
Flexibility	G1	21.45	26.80	26.72	18.56
	G2	21.38	22.10	22.18	
Balance (sec)	G1	18.62	26.45	26.30	22.94
	G2	18.70	19.85	20.00	
Core Strength (sec)	G1	42.30	71.50	71.20	31.65
	G2	41.95	46.80	47.10	
Agility (sec)	G1	11.45	10.10	10.12	16.48
	G2	11.42	11.20	11.18	

The level of significance 0.05
G1- Experimental group
G2- Control Group

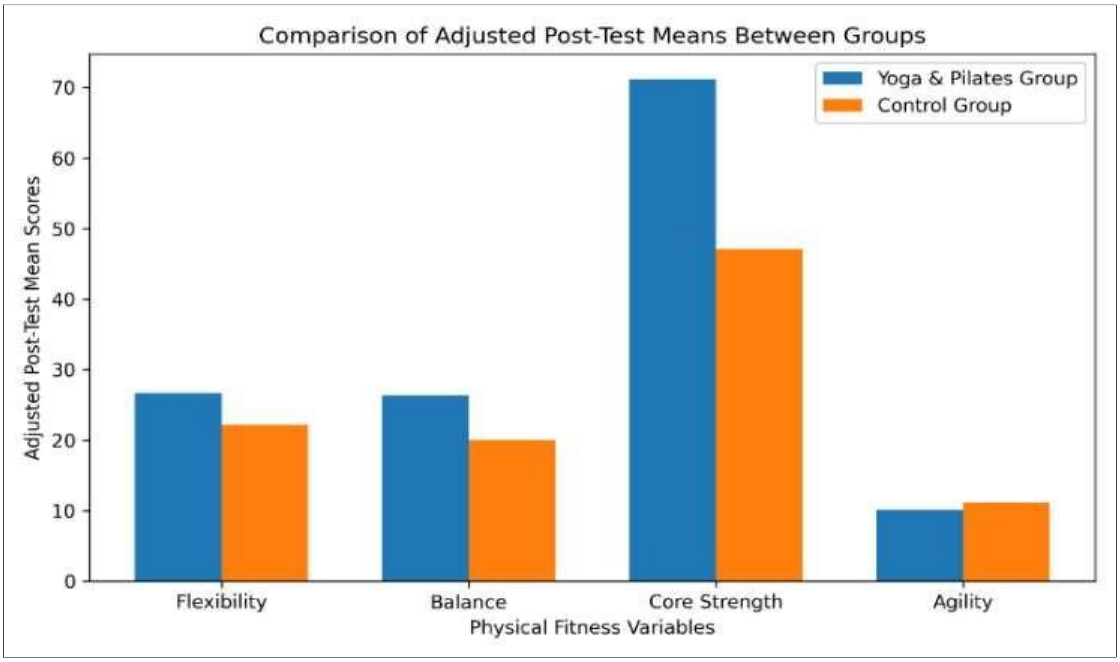

Fig. 1: Adjusted Post-Test Mean Between Experimental and Control Group

RESULT AND DISCUSSION

The result of the study found that the yoga and pilates training (experimental group) showed significant improvement in all variables flexibility, balance, core strength, and agility when compared to the control group. Improvements in flexibility may be attributed to sustained stretching, joint mobilization, and muscle elongation inherent in Yoga practices (Tran *et al.,* 2001; Ross & Thomas, 2010). Enhanced balance and core strength could be due to controlled movements, postural alignment, and stabilization exercises emphasized in Pilates training (Sekendiz *et al.,* 2007; Wells *et al.,* 2012). The observed improvements in agility may be linked to improved neuromuscular coordination and core stability, which are critical for badminton specific movement patterns (Sheppard & Young, 2006; Phomsoupha & Laffaye, 2015). These findings are consistent with earlier studies highlighting the effectiveness of mind–body training interventions in athletic populations.

CONCLUSION

It was concluded that a six-week Yoga and Pilates training programme significantly improved selected physical fitness variables of school-level badminton players. Therefore, Yoga and Pilates may be effectively incorporated into regular badminton training programmes to enhance performance, postural control, and injury prevention among school athletes.

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