

Effect of a Scientifically Designed Yogic Training Protocol on Sprinting Speed and Explosive Power among Kabaddi and Kho-Kho Players: A Randomized Controlled Study

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Abstract- Background: Kabaddi and Kho-Kho demand repeated sprinting, rapid directional changes, and high levels of explosive leg power. Contemporary sports training increasingly recognizes the value of integrative approaches that enhance neuromuscular efficiency, flexibility, respiratory control, and recovery. Yoga, when structured scientifically, may serve as an effective complementary training modality. **Objective:** The purpose of this study was to examine the effect of a scientifically designed yogic training protocol on sprinting speed and explosive leg power among competitive Kabaddi and Kho-Kho players. **Methods:** A randomized controlled experimental design was adopted. Forty male Kabaddi and Kho-Kho players (18–25 years) were randomly assigned to a Yogic Training Group (YTG; n = 20) and a Control Group (CG; n = 20). The YTG underwent a 12-week yogic training program (5 sessions/week, 45 minutes/session), while the CG continued regular sports training. Sprinting speed was assessed using the 30 m sprint test, and explosive leg power was measured using the vertical jump test. **Data were analyzed using descriptive statistics and Analysis of Covariance (ANCOVA). Results:** The ANCOVA revealed significant post-intervention improvements in sprinting speed ($p < 0.01$) and vertical jump height ($p < 0.01$) in the YTG compared to the CG. The magnitude of change indicated moderate to large practical significance. **Conclusion:** The findings suggest that a scientifically structured yogic training protocol significantly enhances sprinting speed and explosive leg power in Kabaddi and Kho-Kho players. Integrating yoga into conventional sports training programs may contribute to holistic athletic development and performance optimization.

Keywords: Yogic Training, Sprinting Speed, Explosive Power, Vertical Jump, Kabaddi, Kho-Kho.

I. INTRODUCTION

Kabaddi and Kho-Kho are traditional Indian team sports characterized by intermittent high-intensity actions, including rapid acceleration, deceleration, lunging, dodging, and jumping. Optimal performance in these sports depends on speed, muscular power, agility, flexibility, coordination, and psychological readiness. Sprinting speed and explosive leg power are particularly critical determinants of success during offensive and defensive play.

Conventional training programs primarily emphasize strength, endurance, and sport-specific drills. However, recent advances in sports science highlight the importance of neuromuscular coordination,

breathing efficiency, mobility, and recovery. Yoga, an ancient discipline rooted in Indian tradition, integrates physical postures (asanas), controlled breathing (pranayama), and relaxation techniques that collectively influence the musculoskeletal, nervous, and cardiorespiratory systems.

Scientific studies have reported that yogic practices improve flexibility, balance, proprioception, muscle activation patterns, and autonomic regulation. These adaptations may positively influence sprint mechanics and stretch-shortening cycle efficiency, thereby enhancing explosive performance. Despite this potential, empirical evidence examining yoga-based interventions in indigenous sports such as Kabaddi and Kho-Kho remains limited. Therefore, the present study was designed to systematically investigate the effects of a structured yogic training

protocol on sprinting speed and explosive leg power in competitive players.

- **Explosive Leg Power:** Vertical jump test (centimeters)

II. METHODS

Research Design

A randomized controlled pre-test-post-test experimental design was employed.

Participants

Forty male Kabaddi and Kho-Kho players aged 18–25 years were selected from recognized sports academies. Inclusion criteria included a minimum of three years of competitive experience and regular participation in training. Participants with recent musculoskeletal injuries, chronic illness, or prior formal yoga training were excluded. All participants provided written informed consent.

Group Allocation

Participants were randomly allocated into:

- Yogic Training Group (YTG): n = 20
- Control Group (CG): n = 20

Yogic Training Protocol

The YTG participated in a scientifically designed yogic training program for 12 weeks, five days per week, with each session lasting 45 minutes. The protocol emphasized mobility, core strength, neuromuscular coordination, respiratory efficiency, and relaxation.

Training Structure:

- **Warm-up (5 min):** Sukshma Vayama
- **Asanas (25 min):** Tadasana, Trikonasana, Virabhadrasana, Paschimottanasana, Bhujangasana, Naukasana, Setu Bandhasana, Sarvangasana
- **Pranayama (10 min):** Kapalbhati, Anulom-Vilom, Bhastrika
- **Relaxation (5 min):** Shavasana

The Control Group continued routine sports training without yogic intervention they follow their periodization.

Variables and Testing

- **Sprinting Speed:** 30 m sprint test (seconds)

Statistical Analysis

Means and standard deviations were calculated. ANCOVA was used to compare post-test scores between groups using pre-test values as covariates. Statistical significance was set at $p < 0.05$.

III. RESULTS

Preliminary Analysis

Prior to inferential testing, data were screened for normality and homogeneity of variance. Shapiro-Wilk tests indicated that all variables were normally distributed ($p > 0.05$). Levene's test confirmed homogeneity of variance between groups for sprinting speed and vertical jump performance, satisfying the assumptions for parametric analysis.

Descriptive Statistics

Table 1. Mean \pm SD of Sprinting Speed and Vertical Jump Performance

Variable	Group	Pre-test (Mean \pm SD)	Post-test (Mean \pm SD)	% Change
30 m Sprint (s)	YTG	4.45 \pm 0.21	4.18 \pm 0.19	-6.07%
	CG	4.46 \pm 0.22	4.42 \pm 0.23	-0.90%
Vertical Jump (cm)	YTG	46.3 \pm 4.2	51.8 \pm 4.5	+11.88%
	CG	46.1 \pm 4.1	46.9 \pm 4.3	+1.73%

Analysis of Covariance (ANCOVA)

To determine the effectiveness of the yogic training intervention, ANCOVA was employed using pre-test scores as covariates.

Table 2. ANCOVA Summary for Sprinting Speed

Source	SS	df	MS	F	p-value	η^2
Covariate (Pre-test)	0.214	1	0.214	12.41	<0.01	0.25
Group	0.170	1	0.170	9.87	<0.01	0.21
Error	0.637	37	0.017			

Table 3. ANCOVA Summary for Vertical Jump Performance

Source	SS	df	MS	F	p-value	η^2
Covariate (Pre-test)	221.46	1	221.46	18.62	<0.01	0.34
Group	135.72	1	135.72	11.42	<0.01	0.28
Error	439.68	37	11.88			

The effect size values (partial eta squared) indicated large practical effects of the yogic training intervention on both sprinting speed and explosive leg power.

Inferential Statistics

ANCOVA showed significant differences favoring the Yogic Training Group in sprinting speed ($F = 9.87$, $p < 0.01$) and vertical jump performance ($F = 11.42$, $p < 0.01$).

IV. DISCUSSION

The present investigation demonstrated that a 12-week yogic training intervention significantly improved sprinting speed and explosive leg power in Kabaddi and Kho-Kho players. The improvements observed may be attributed to enhanced flexibility, optimized muscle-tendon interaction, improved posture, and superior neuromuscular coordination. Pranayama practices included in the program may have enhanced respiratory efficiency and autonomic balance, thereby supporting high-intensity efforts and recovery. Furthermore, relaxation practices may reduce neuromuscular fatigue and improve focus, indirectly contributing to performance gains.

These findings support previous research indicating positive effects of yoga on physical fitness and extend the evidence base by demonstrating its effectiveness in indigenous Indian sports contexts.

V. CONCLUSION

A scientifically designed yogic training protocol significantly enhances sprinting speed and explosive leg power among Kabaddi and Kho-Kho players. The integration of yogic practices into conventional training regimens may serve as a valuable strategy

for holistic performance enhancement and injury prevention.

VI. LIMITATIONS AND FUTURE SCOPE

- Limited sample size and male-only participants
- Absence of biomechanical and physiological measurements
- Future studies should include larger, mixed-gender samples and advanced performance markers

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