

Effect of Yoga Practices on Balance and Coordination among Competitive Athletes

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Abstract

Background: Yoga has gained considerable importance in sports training due to its positive effects on physical fitness, postural control, and mental concentration. Balance and coordination are essential motor abilities for athletic performance, yet limited studies have examined the specific impact of yoga practices on these abilities among competitive athletes. **Aim:** The present study aimed to investigate the effect of yoga practices on the balance and coordination of athletes in the Bankura district. **Methods:** For this purpose of the present study total forty (n=40) male athletes were selected from various clubs in Bankura District who had participated at least at the state or inter-collegiate level tournaments. The participants were selected through purposive random sampling. The age of the participants ranged from 18 to 25 years. All participants were free from injuries during the data collection period and did not consume any ergogenic aids or nutritional supplements. An eight-week yoga training programme was implemented, consisting of three sessions per week, with each session lasting 60 minutes. The programme included 10 minutes of pranayama emphasizing breathing exercises, 35 minutes of asanas emphasizing flexibility, followed by 15 minutes of cool-down, mindfulness, and relaxation practices. Pre-test and post-test assessments were conducted before and after the intervention programme. Balance was assessed using the stork balance stand test, while coordination was measured through the alternate hand wall toss test. The collected data were analysed using the descriptive and analytical statistics viz. mean, standard deviation, and paired 't' test. **Results:** The findings revealed a significant improvement in balance performance, as the calculated 't' value (6.098) exceeded the tabulated value (2.022). However, coordination did not show a statistically significant improvement, with the calculated 't' value (1.703) was lower than the tabulated value (2.022). **Discussion:** The study found that yoga practices are effective in enhancing balance among athletes by improving postural stability, muscular control, and proprioceptive awareness. However, the intervention was not sufficient to produce significant improvement in coordination, possibly due to the limited duration of training and the sport-specific nature of coordination abilities. **Conclusion:** Yoga may be considered an effective supplementary training method for improving balance in athletes.

Keywords: Yoga, Athletes, Balance, Coordination, Performance.

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INTRODUCTION

Yoga is one of the oldest holistic systems of physical and mental training, originating in ancient India and widely practiced across the world for promoting overall health and performance. In recent years, yoga has gained increasing recognition in the field of sports science due to its potential benefits in enhancing physical fitness components such as flexibility, balance, coordination, muscular endurance, and mental concentration (Tran *et al.*, 2001). Athletes require not only strength and endurance but also refined motor abilities such as balance and coordination for optimal performance. Yoga, through its integrated approach

combining physical postures (asanas), breathing techniques (pranayama), and relaxation practices, provides a comprehensive method to improve these essential motor abilities (Polsgrove *et al.*, 2016).

Balance is defined as the ability to maintain the body's center of gravity within the base of support. It plays a crucial role in almost all sports activities, including running, jumping, throwing, and rapid directional changes. Good balance allows athletes to maintain stability during dynamic movements and reduces the risk of injuries. Static balance refers to maintaining equilibrium in a stationary position, whereas dynamic balance involves maintaining control during

movement. Both types are important for athletes to perform efficiently. Yoga postures often require maintaining various body positions for a certain duration, thereby strengthening stabilizing muscles and improving proprioception (Hakked *et al.*, 2017). Regular practice of yoga enhances neuromuscular coordination and helps athletes develop better control over their body movements.

Coordination is another vital motor component that refers to the harmonious functioning of muscles and nervous system to produce smooth and efficient movements. It involves the integration of sensory input, central processing, and motor output. In sports, coordination enables athletes to perform complex skills accurately and efficiently. Hand-eye coordination, foot-eye coordination, and overall body coordination are necessary for effective performance in competitive sports. Yoga practices involve controlled movements and transitions between postures, which may help in improving coordination by enhancing body awareness and neuromuscular efficiency (Bhavanani *et al.*, 2013).

The role of yoga in improving physical fitness parameters has been widely studied. Previous research indicates that yoga training improves flexibility, muscular strength, balance, and mental concentration. Yoga enhances proprioceptive awareness, which helps individuals understand body position and movement in space (De *et al.*, 2016). This awareness is essential for maintaining balance and performing coordinated movements (Polsgrove *et al.*, 2016). Controlled breathing during yoga practice also helps in improving focus and reducing anxiety, which indirectly contributes to better motor performance (Telles *et al.*, 2012). Additionally, yoga promotes relaxation and recovery, allowing athletes to maintain consistent training and reduce fatigue. In the context of sports training, traditional conditioning programs often focus on strength, speed, and endurance, while neglecting balance and coordination (Islam *et al.*, 2018). However, these motor abilities are equally important for performance enhancement and injury prevention (De *et al.*, 2015). Yoga provides a low-impact training method that can be incorporated into regular training schedules without causing excessive fatigue. The slow and controlled nature of yoga exercises allows athletes to focus on posture alignment, muscle engagement, and breathing patterns. This integrated approach helps in improving motor control and body mechanics (Tran *et al.*, 2001). Bankura district of West Bengal has a growing number of athletes participating in various sports at state and inter-collegiate levels. Despite their active involvement, many athletes lack structured supplementary training programs that focus on balance and coordination. Introducing yoga-based interventions may help in enhancing these motor abilities and contribute to overall athletic performance. Yoga is easily accessible, cost-effective, and does not require specialized equipment, making it suitable for athletes from different

backgrounds. Yoga practices such as Surya Namaskar, Warrior poses, Chair pose, Plank, and Lunges require maintaining stability and controlled movement patterns (Roy *et al.*, 2016). These postures strengthen core muscles, improve joint stability, and enhance neuromuscular coordination. Pranayama techniques improve breathing efficiency and mental focus, while relaxation practices reduce stress and promote recovery. Together, these components form a comprehensive training method that may positively influence balance and coordination (Hakked *et al.*, 2017).

Several studies have reported significant improvements in balance following yoga training. Researchers have suggested that yoga enhances proprioception and strengthens stabilizing muscles around joints (Bhavanani *et al.*, 2013). Similarly, coordination improvements have been associated with controlled movement patterns and enhanced neuromuscular integration developed through yoga practice. However, findings related to coordination improvements are mixed, indicating the need for further research in this area, particularly among athletes. Furthermore, yoga contributes to mental stability, concentration, and stress management. Athletes often face psychological pressure during competitions, which may affect their coordination and balance. Yoga techniques such as mindfulness and relaxation help in reducing anxiety and improving focus (Telles *et al.*, 2012). Improved mental clarity enables athletes to perform skills more effectively and maintain body control under pressure. Despite the growing popularity of yoga, limited research has been conducted specifically on athletes of Bankura district. Therefore, this study attempts to fill this gap by examining the effect of yoga-based intervention on balance and coordination.

Aim of the study

The present study was design to investigate the effect of yoga practices on balance and coordination among athletes of Bankura District.

METHODOLOGY

Participants

The study included forty (n=40) male athletes aged between 18 and 25 years, selected from various sports clubs in Bankura District. All participants had prior competitive experiences, having participated at least at the state or inter-collegiate level tournaments. The selection of the participant was confirmed using purposive random sampling. Only those athletes who were free from any injury during the data collection period and who were not using any ergogenic aids or nutritional supplements were included in the study. All participants were informed about the nature and purpose of the study and their voluntary consent was obtained prior to participation.

Variables Studied

The study included two main variables: the independent variable was the structured yoga training programme, which consisted of pranayama, selected asanas, and relaxation practices administered over an eight-week period. The dependent variables were balance and coordination. Balance was assessed using the stork balance stand test, while coordination was measured using the alternate hand wall toss test.

Study Design

The present study followed one-group pre-test and post-test experimental research design to examine the effect of yoga practices on balance and coordination among athletes. No control group was included. Pre-test measurements were taken before the commencement of

the yoga training programme and post-test were recorded after the completion of eight-week intervention.

Experimental Protocol

The experimental protocol of the study consisted of an eight weeks yoga intervention programme conducted three days per week, with each session lasting 60 minutes. The schedule included 10 minutes of pranayama, 35 minutes of yoga asanas and 15 minutes of mindfulness practices. Pre-test assessments were carried out before the commencement of the programme, and post-test assessments were conducted after completion of the intervention. All the participants attended the practice sessions regularly under proper supervision and maintained similar daily activity patterns throughout the experimental period. Details protocol of yoga practice is given in the [Table-1].

Table-1: Details protocol of eight weeks yoga intervention

Component	Particular Activities	Duration per Session	Session duration	Programme duration	Frequency	Purpose
Pranayama	Anulom Vilom Kapalabhati Bhramari	10 minutes	60 minutes per session	8 weeks	3 session per week	Improve breathing efficiency, concentration, and relaxation
Asanas	Surya Namaskar (Sun salutation) Virabhadrasana (Warrior Poses) Utkatasana (Chair Pose) Phalakasana (Plank Pose) Anjaneyasana (Low Lunge)	35 minutes				Enhance flexibility, muscular endurance, balance, and core muscle strength
Mindfulness & Relaxation	Shavasana (Corpse Pose) Guided Mindfulness Meditation Deep Relaxation Techniques	15 minutes				Promote recovery, mental calmness, and stress reduction

Statistical analysis

The collected data was analyzed using descriptive statistics, including mean and standard deviation for pre-test and post-test scores of balances and coordination. Further paired 't' test was applied to identify the significant differences between pre-test and post-test means of the eight-week yoga intervention. The level of significance was set at 0.05.

RESULTS

The mean value of balance in the pre-test was 42.15, which increased to 43.35 in the post-test, indicating a mean difference of 1.20. The calculated t-value of balance was 6.098, which exceeded the critical value of 2.022 at 0.05 level of significance. The corresponding p-value ($p=0.043$) was also less than 0.05, confirming a statistically significant improvement in balance following the yoga intervention [Table-2].

Table No.: 2 Comparison of balance between pre-test and post-test among athletes

Variable	Test	Mean	SD	Mean difference	df	t value	p value	t critical
Balance	Pre	42.15	14.592	1.2	39	6.098*	0.043	2.022
	Post	43.35	14.489					

*Significant at 0.05 level

In coordination, the pre-test mean score was 18.30, which slightly increased to 18.60 in the post-test, resulting in a mean difference of 0.30. The calculated t-value of coordination was 1.703, which was lower than

the critical value of 2.022 at 0.05 level of significance. The p-value (p=0.0964) was greater than 0.05, indicating that the observed improvement in coordination was not statistically significant [Table-3].

Table No.: 3 Comparison of coordination between pre-test and post-test among athletes

Variable	Test	Mean	SD	Mean difference	df	t value	p value	t critical
Balance	Pre	18.3	3.241	0.3	39	1.703	0.0964	2.022
	Post	18.6	3.374					

*Significant at 0 .05 level

Overall, the findings suggest that the eight-week yoga intervention significantly improved balance among athletes of Bankura District, while its effect on

coordination was minimal and not statistically significant.

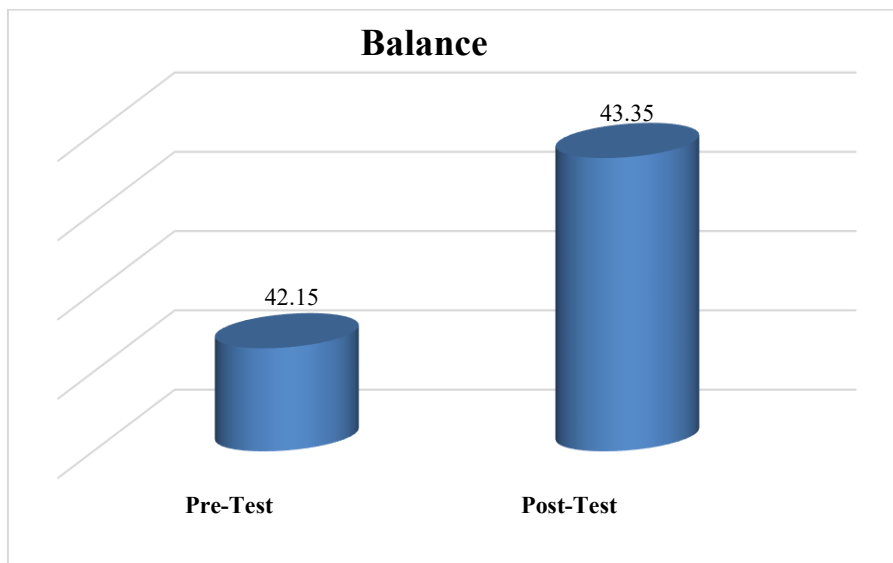


Figure-1: Comparison of balance after yoga practice

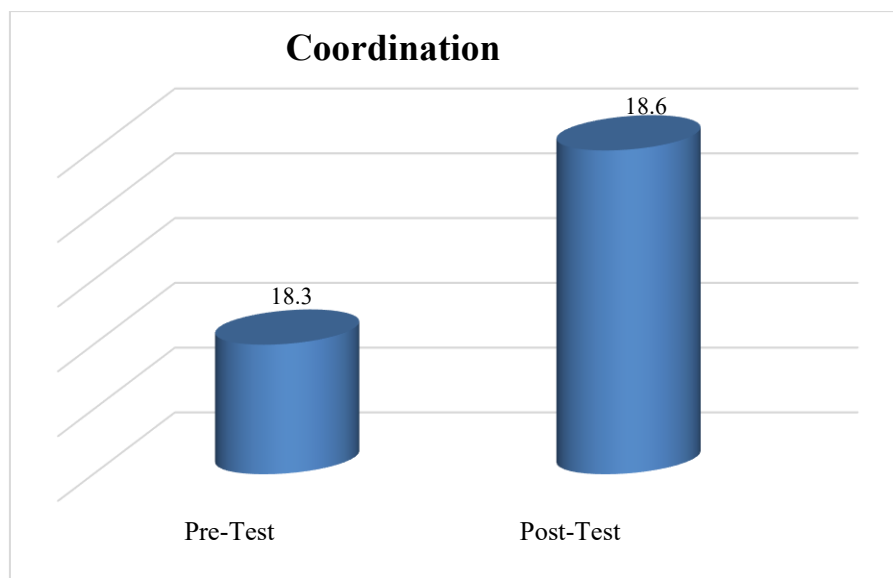


Figure-2: Comparison of coordination after yoga practice

DISCUSSIONS

The present study aimed to examine the effect of eight-week yoga practice on balance and coordination

of male athletes of Bankura district. The results revealed that yoga practice had a significant effect on balance. This improvement may be attributed to regular practice of yoga asanas which emphasize stability, muscle

control, and body awareness (De *et al.*, 2016). Yoga also enhances proprioception, strengthens core muscles, and improves neuromuscular coordination (De *et al.*, 2019, 2020), which directly contributes to better balance performance. On the other hand, coordination showed a slight increase from a pre to post mean but not statistically significant. Although yoga practices include movements that may indirectly influence coordination, the training programme might not have included sufficient dynamic and skill-based activities specifically targeting hand-eye coordination (Roy *et al.*, 2016., De *et al.*, 2015). Therefore, the small improvement observed may be due to general neuromuscular adaptation rather than a direct training effect. The findings suggest that yoga training is more effective for improving static balance compared to coordination. Balance related improvements occur due to sustained postural control and controlled breathing techniques, whereas coordination may require more sport specific drills and dynamic exercises.

CONCLUSION

The findings of the present study indicate that regular yoga practice has a positive effect on the balance ability of athletes by improving postural control, muscular stability, and body awareness. However, the yoga intervention did not produce a statistically significant improvement in coordination, possibly due to the short duration of training and the complex, sport specific nature of coordination skills. Therefore, yoga may be considered an effective supplementary training method for enhancing balance and overall physical stability among athletes, while longer and more specialized training programmes may be required to achieve significant improvements in coordination.

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