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A Study on the Role of Yogic Practices in Enhancing Coordination among Adolescent Boxing Players

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ABSTRACT: The present study aimed to investigate the effect of selected yogic practices on coordination among adolescent boxing players. Coordination is a fundamental motor ability that integrates neuromuscular control, timing, balance, and hand-eye synchronization, all of which are essential for optimal performance in boxing. Yogic practices have gained increasing attention in sports science due to their holistic approach to physical and psychological development. The study employed an experimental pre-test and post-test design involving adolescent male boxing players aged between 12 and 18 years. A total of 30 participants underwent structured yogic training including selected asanas, pranayama, and concentration techniques for a specified duration. Coordination ability was assessed using standardized motor coordination tests before and after the intervention period. Statistical analysis included descriptive statistics and paired sample t-tests to evaluate differences between pre- and post-intervention scores. Results indicated significant improvement in coordination ability following yogic practice. The findings suggest that yoga enhances neuromuscular efficiency, proprioception, and motor control, thereby improving coordination performance in adolescent athletes. The study supports the integration of yoga into boxing training programs to optimize skill execution and athletic development.

KEYWORDS: Yoga, Coordination, Boxing Players, Adolescents, Motor Skills, Sports Training.

I. INTRODUCTION

Yoga is an ancient Indian discipline that integrates physical postures, breathing control, and mental concentration to enhance physical and psychological well-being. Traditionally associated with spiritual practices, yoga has increasingly been recognized as an effective complementary training method in modern sports science. Its emphasis on controlled movement, balance, and awareness aligns closely with the requirements of coordination-based sports such as boxing.

Coordination refers to the ability to synchronize multiple body parts efficiently to perform smooth and controlled movements. In boxing, coordination plays a critical role in executing complex technical skills such as punching combinations, defensive maneuvers, footwork transitions, and reaction to opponent movements. Efficient coordination allows athletes to maintain balance, regulate force production, and execute movements with precision and timing.

Adolescence represents a critical period of neuromuscular development during which motor learning and coordination abilities can be significantly enhanced through appropriate training interventions. Yogic practices promote neuromuscular integration by improving body awareness, sensory feedback, and cognitive focus. Therefore, exploring the effectiveness of yoga in improving coordination among adolescent boxing players is highly relevant to both sports training and youth athletic development.

Statement of the Problem

To examine the effect of selected yogic practices on coordination of adolescent boxing players by evaluating changes in neuromuscular control, balance, timing, and hand-eye coordination following a structured yoga intervention program. The study aims to investigate whether the integration of specific yogic practices, including asanas, pranayama, and concentration techniques, contributes to measurable improvements in motor coordination abilities that are essential for effective boxing performance. Furthermore, the research seeks to understand how yoga-based training enhances

movement efficiency, reaction ability, and overall coordination through improved interaction between the nervous and muscular systems. By comparing pre-test and post-test coordination performance, the study intends to provide scientific evidence regarding the role of yoga as a complementary training method for adolescent boxing athletes.

Objectives

The present study aims to assess the coordination ability of adolescent boxing players and to determine the effect of selected yogic practices on their coordination performance. Specifically, the research focuses on evaluating the existing level of coordination among adolescent boxers and examining whether the integration of structured yogic practices contributes to significant improvements in neuromuscular control, balance, timing, and hand–eye coordination. By analysing pre-test and post-test performance measures, the study seeks to provide scientific evidence regarding the effectiveness of yoga as a complementary training method for enhancing coordination abilities essential for boxing performance.

II. REVIEW OF LITERATURE

Previous research indicates that yoga enhances neuromuscular coordination, proprioception, and balance. Studies involving athletes have demonstrated improvements in motor control and reaction time after yoga interventions. Research on children and adolescents has also revealed that yoga improves motor proficiency and coordination-related performance variables. These findings highlight yoga's potential role in sports requiring high levels of coordination.

III. METHODOLOGY

Research Design

The present study adopted an experimental research design using a single-group pre-test and post-test approach. This design was selected to evaluate the effectiveness of selected yogic practices on coordination ability by comparing participants' performance before and after the intervention period. Experimental designs are widely used in sports science to determine causal relationships between training interventions and performance outcomes.

The pre-test provided baseline measurements of coordination ability, while the post-test assessed changes following the yogic intervention. By controlling extraneous variables and maintaining standardized testing conditions, the study aimed to ensure internal validity and reliable measurement of outcomes.

Participants

The participants in the present study consisted of adolescent male boxing players aged between 12 and 18 years, representing a developmental stage characterized by rapid physical growth and neuromuscular maturation. A total of 30 participants were selected using purposive sampling, ensuring that individuals met specific criteria relevant to the objectives of the research. Purposive sampling was adopted to include participants who were actively involved in boxing training and possessed the necessary experience to perform coordination-based assessments reliably. The selection process considered factors such as training background, physical fitness level, and willingness to participate in the yogic intervention program. This sampling method allowed the researcher to focus on a homogeneous group with similar athletic characteristics, thereby enhancing the internal validity of the study. All participants were informed about the purpose and procedures of the research, and participation was voluntary. The chosen sample size was considered adequate to evaluate the effects of yogic practices on coordination while maintaining feasibility within the research setting.

Inclusion Criteria & Exclusion Criteria

The participants included in the study were adolescent boxing players who met specific inclusion and exclusion criteria to ensure consistency and validity of the research outcomes. The inclusion criteria required participants to be actively engaged in regular boxing training, fall within the age range of 12 to 18 years, and be free from any major injuries or medical conditions that could negatively affect physical performance or participation in the intervention program. Participants with prior advanced yoga training were excluded to avoid bias arising from previous exposure to yogic practices. Additionally, individuals with musculoskeletal disorders or neurological conditions affecting coordination were excluded to ensure that any observed improvements could be attributed primarily to the yogic intervention rather than underlying health factors. Adolescence was selected as the target population because this developmental stage is characterized by significant physical growth and rapid maturation of neuromuscular coordination, making it an ideal period for implementing training interventions aimed at enhancing motor abilities and coordination performance.

Yogic Intervention Program

Session Component	Activities	Week 1–2 Duration	Week 3–6 Duration
Warm-up	Opening prayer	1 minute	1 minute
	Deep breathing	1 minute	1 minute
	Loosening exercises	4 minutes	4 minutes
Asanas	Tadasana		
	Trikonasana		
	Paschimottanasana		
	Bhujangasana		
	Vrikshasana		
	Utkatasana		
	Ardha Chakrasana		
	Ardha Chandrasana		
	Halasana		
	Virabhadrasana (I)		
	Total Asana Practice Time	10 minutes	20 minutes
	Practice Intensity	30 sec × 3 sets	30 sec × 4 sets
	Pranayama	Anulom-Vilom Pranayama	
Ujjayi Pranayama			
Bhramari Pranayama		9 minutes	9 minutes
Concentration Practice	Trataka	5 minutes (2 rounds)	5 minutes (2 rounds)
Cooling Down	Guided meditation	2 minutes	2 minutes
	Shavasana	2 minutes	2 minutes
	Closing prayer	1 minute	1 minute
Total Session Duration		40 minutes	50 minutes

Measurement of Coordination

Coordination was assessed using standardized performance tests commonly applied in sports science research to ensure objective and reliable measurement. Specifically, the Alternate Hand Wall Toss Test was used to evaluate hand–eye coordination, which is a critical component of coordination performance in boxing as it reflects the ability to synchronize visual input with motor responses. The test was administered under controlled conditions to maintain consistency and accuracy of results. Pre-test assessments were conducted prior to the implementation of the yogic intervention to establish baseline coordination levels among participants, while post-test assessments were carried out after completion of the training program to measure any changes or improvements resulting from the intervention. This pre-test and post-test procedure allowed for systematic comparison and evaluation of the effectiveness of selected yogic practices in enhancing coordination ability among adolescent boxing players.

Procedure

Participants were briefed about study objectives and consent was obtained. Pre-test measurements were recorded under controlled conditions. The yogic training program was then administered under supervision to ensure correct technique and adherence.

Environmental factors such as training surface, timing, and equipment were standardized. Participants were instructed to maintain their regular boxing training routine while incorporating yoga sessions.

Statistical Analysis

Data analysis included:

- Mean and Standard Deviation.
- Paired Sample t-test.
- Level of significance set at 0.05.

Statistical procedures were selected to determine whether changes in coordination scores were statistically significant following the intervention.

Ethical Considerations

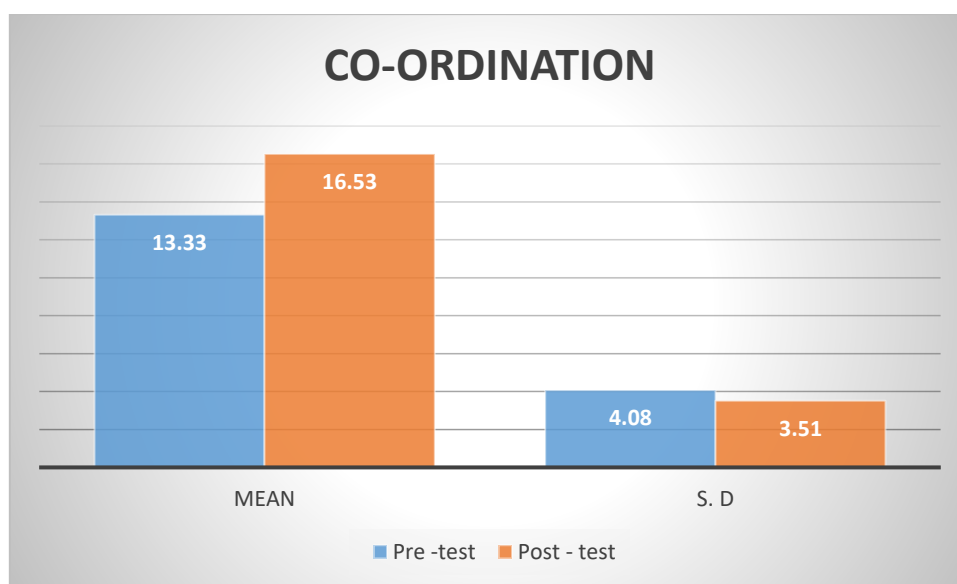
Participants were informed about study procedures and voluntary participation was ensured. Confidentiality was maintained, and participants were allowed to withdraw at any stage.

IV. RESULTS AND STATISTICAL ANALYSIS

**Table 1
Descriptive Statistics**

Test	N	Mean	S. D	SEM	df	Cal T	Tab T
Pre -test	30	13.33	4.08	0.74	29	11.7252	2.045
Post - test	30	16.53	3.51	0.64	29	11.7252	2.045

Graph No.1



V. DISCUSSION

The results indicate significant improvement in coordination ability following yogic practice. Yoga enhances neuromuscular efficiency by strengthening communication between the nervous system and muscles, thereby promoting smoother and more controlled movement execution. Balance-based asanas improve proprioception and postural stability, while pranayama techniques enhance concentration, reaction control, and overall motor regulation. Improved coordination may also result from increased body awareness and reduced unnecessary muscular tension, allowing athletes to perform movements more efficiently and accurately. These findings are consistent with previous research highlighting the positive effects of yoga on motor performance and coordination abilities. For example, Beyleroğlu (2018) reported significant improvements in hand–eye coordination among boxing athletes following structured training interventions. Similarly, Donahoe-Fillmore et al. (2019) found that yoga practice improved balance and motor coordination in children, indicating enhanced neuromuscular control. Polsgrove et al. (2016) demonstrated that regular yoga training led to improvements in flexibility, balance, and overall movement efficiency in athletes, which are closely associated with coordination performance. Additionally, Pal (2022) emphasized that yoga enhances proprioception, body awareness, and

mental focus, contributing to better coordination and athletic performance. Therefore, the present findings align with existing literature suggesting that yogic practices serve as an effective complementary training approach for improving coordination in adolescent athletes.

VI. CONCLUSION

The study concludes that selected yogic practices significantly improve coordination among adolescent boxing players by enhancing neuromuscular control, balance, timing, and hand–eye synchronization, which are essential components of effective boxing performance. The structured implementation of yoga training contributes to improved communication between the nervous and muscular systems, leading to greater movement efficiency, stability, and precision during physical activities. Furthermore, the incorporation of balance-oriented asanas and controlled breathing techniques promotes heightened body awareness, concentration, and reaction ability, enabling athletes to execute complex motor skills with better control and accuracy. These improvements not only support technical skill development but also reduce unnecessary muscular tension and energy expenditure, thereby optimizing overall performance. The findings suggest that integrating yoga into regular sports training programs can serve as a valuable complementary approach for enhancing coordination and motor performance in adolescent athletes. Additionally, yoga-based interventions may contribute to injury prevention, psychological well-being, and long-term athletic development by fostering physical and mental balance. Therefore, coaches, trainers, and sports practitioners are encouraged to incorporate structured yogic practices within training routines to support holistic performance enhancement among adolescent boxing players.

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