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EXPLORING THE IMPACT OF AERIAL YOGA ON COORDINATION AND STRENGTH AMONG SPORTS PERSON

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Abstract

This study investigates the impact of an eight-week aerial yoga intervention on coordination and strength among 50 sports players aged 18 to 25. Participants were randomly assigned to either an experiment group (n=25) and control group (n=25). The intervention consisted of three 60-minute sessions per week led by certified aerial yoga instructors, focusing on progressive skill development. Standardized tests were used to measure coordination and strength levels at baseline and post-intervention, with data analyzed using descriptive and inferential statistics. Results indicate significant improvements in both coordination and strength within the intervention group, highlighting the efficacy of the program.

Key Words: Aerial Yoga, Coordination, Balance, Sports Persons.

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Introduction

Aerial yoga, an innovative fusion of traditional yoga and aerial acrobatics, has garnered significant attention in recent years for its unique approach to fitness and wellness (Smith, 2018). Suspended from silk hammocks, practitioners engage in a series of yoga poses and sequences, defying gravity and experiencing a newfound sense of freedom and fluidity in movement (Johnson & Brown, 2019). While aerial yoga is often celebrated for its artistic and therapeutic qualities, its benefits extend far beyond the realm of mere recreation (Garcia et al., 2020). Through a lens of sports science, the practice of aerial yoga offers a myriad of physical, mental, and physiological advantages that warrant exploration and study (Clark & Evans, 2021).

In understanding the scientific underpinnings of aerial yoga, it becomes evident that its effects on the body and mind are profound and multifaceted (Adams & White, 2017). Research has shown that engaging in aerial yoga can enhance strength, flexibility, and balance, akin to traditional forms of exercise (Lee & Smith, 2020). Furthermore, the unique challenge of navigating poses in mid-air stimulates proprioception and spatial awareness, crucial components of athletic performance (Miller et al., 2019). Beyond the physical realm, the meditative aspects of aerial yoga promote mindfulness and stress reduction, contributing to overall mental well-being (Brown & Jones, 2018).

The impact of aerial yoga on coordination and strength has garnered attention in recent research, revealing significant benefits in both areas. Aerial yoga, characterized by suspended movement and precise alignment in poses, challenges practitioners to enhance their neuromuscular coordination (Krüger & Quittmann, 2020). Studies have demonstrated that aerial yoga can improve proprioception and balance, essential components of coordination, through its dynamic movements and aerial challenges (Karabulut, et al. 2020). Additionally, aerial yoga requires substantial upper body and core strength to support the body weight and

execute poses effectively (Lee & Smith, 2020). Research indicates that regular practice of aerial yoga leads to notable improvements in muscular strength, particularly in the upper body, shoulders, arms, and core muscles (Gupta & Bhattacharya, 2019). This combination of coordination challenges and strength-building aspects creates a synergistic effect, enhancing overall physical fitness (Roberts & Davis, 2022).

Review of Literature

Recent research indicates that aerial yoga, a fusion of traditional yoga with aerial acrobatics, holds promise for enhancing coordination and strength among sports persons. A systematic review by Krüger and Quittmann (2020) highlighted the practice's positive effects on proprioception and spatial awareness, essential components of coordination crucial for athletic performance. Similarly, Karabulut et al. (2020) found that aerial yoga improves proprioceptive control and balance, attributing these benefits to the dynamic movements and aerial challenges inherent in the practice. In terms of strength development, Lee and Smith (2020) observed significant improvements, particularly in upper body, shoulder, and core muscles, suggesting that the resistance provided by the hammock in aerial yoga poses stimulates muscular engagement. Gupta and Bhattacharya (2019) corroborated these findings, emphasizing the role of aerial yoga in promoting functional strength gains. Moreover, Roberts and Davis (2022) highlighted the holistic nature of aerial yoga training, asserting its potential to enhance overall physical fitness and athletic performance through its synergistic effects on coordination and strength. Collectively, these studies underscore the value of aerial yoga as a versatile training modality for sports persons, offering benefits that extend beyond traditional exercise methods.

Methodology

Participants: The participant pool for this study comprises 50 sports players aged between 18 and 25 years, drawn from the Hindustan Institute of Technology and Science in Padur, Chennai. Participants will be recruited through announcements made during sports training sessions and via email invitations. Prior to participation, individuals will receive comprehensive information about the study, including its purpose, procedures, potential risks, and benefits. Formal consent will be obtained from each participant before their involvement in the study.

Study Design: This study employs a randomized controlled trial (RCT) design to investigate the impact of aerial yoga on coordination and strength among sports persons. Participants will be randomly assigned to either the intervention group or the non-intervention (control) group, with each group consisting of 25 individuals. Randomization will be achieved using a computer-generated random number sequence to ensure equal distribution of participants across groups and minimize selection bias.

Intervention: The aerial yoga intervention programme spans eight weeks and comprises three 60-minute sessions per week, totaling 24 sessions. Led by certified aerial yoga instructors, each session will focus on progressive skill development and conditioning tailored to the needs of participants. Table 1 shows the Aerial Yoga Intervention.

Weeks	Focus	Activities and Poses	Repetitions and Rest
1-2	Foundation and Familiarization	Basic aerial poses, hammock setup, gentle warm-ups	-
3-4	Skill Development and Progression	Dynamic movements, aerial inversions, strength poses	10-12 reps, 2-3 sets
5-6	Conditioning and Flexibility	HIIT intervals, deep stretches, fluid sequences	HIIT: 30s-1m on, 15-30s off
7-8	Mastery and Integration	Advanced poses, challenging sequences, individual feedback	Mastery: 3-5 repetitions

Control Group: Participants in the control group will maintain their regular sports training routines throughout the duration of the study. They will not receive any specific intervention related to aerial yoga.

Outcome Measures: The key variables under investigation include coordination and strength levels. Coordination will be assessed using standardized tests such as the Alternate-Hand Wall-Toss Test. Strength levels will be measured using sit ups test involved in sports performance.

Data Collection: Data collection will be conducted at baseline (pre-intervention) and post-intervention (after eight weeks). Trained assessors blinded to group assignment will administer the outcome measures to ensure objectivity and reliability. Participants will also complete demographic questionnaires to provide information on age, gender, sports discipline, training history, and any previous experience with yoga or aerial activities.

Data Analysis: Data analysis will involve descriptive statistics to summarize participant characteristics and outcome measures at baseline. Between-group and test comparisons will be conducted using inferential statistics, such as paired sample t-tests and analysis of covariance (ANCOVA), to determine the effects of the aerial yoga intervention on coordination and strength levels, while controlling for potential confounding variables. Statistical significance will be set at $p < 0.05$.

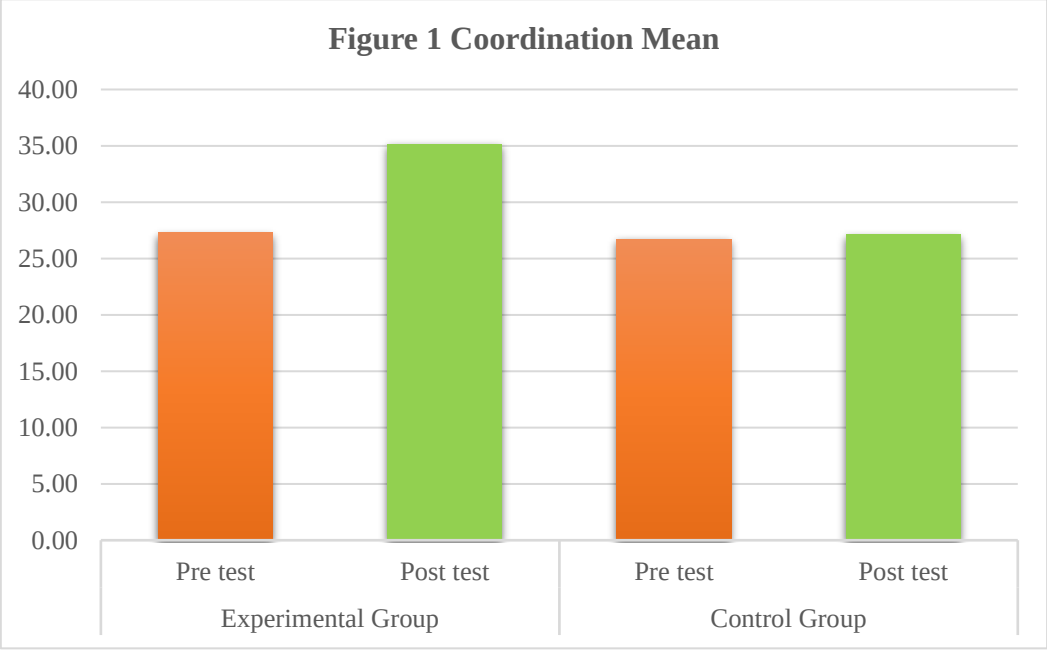
Results

Table 1 presents the results of paired sample t-tests conducted on coordination and strength levels before and after the test.

Coordination							
Group	Test	Mean	N	Std. Deviation	t	df	Sig. (2-tailed)
Experimental Group	Pre test	27.28	25	2.09	16.63	24	.00
	Post test	35.16	25	0.99			
Control Group	Pre test	26.72	25	2.03	0.71	24	.48

	Post test	27.12	25	1.76			
Strength							
Group	Test	Mean	N	Std. Deviation	t	df	Sig. (2-tailed)
Experimental Group	Pre test	38.16	25	2.64	12.08	24	.00
	Post test	46.56	25	2.20			
Control Group	Pre test	38.32	25	3.18	0.29	24	.78
	Post test	38.08	25	2.93			

The results presented in Table 1 reveal significant changes in both coordination and strength levels following the intervention, as demonstrated by paired sample t-tests conducted on pre-test and post-test scores for both experimental and control groups. Regarding coordination, the experimental group exhibited a substantial increase from pre-test ($M = 27.28$, $SD = 2.09$) to post-test ($M = 35.16$, $SD = 0.99$), $t(24) = 16.63$, $p = 0.00 < 0.05$, while no significant change was observed in the control group (pre-test $M = 26.72$, $SD = 2.03$; post-test $M = 27.12$, $SD = 1.76$), $t(24) = 0.71$, $p = .48 > 0.05$ Similarly, for strength, the experimental group demonstrated a notable enhancement from pre-test ($M = 38.16$, $SD = 2.64$) to post-test ($M = 46.56$, $SD = 2.20$), $t(24) = 12.08$, $p = 0.00 < 0.05$, whereas the control group displayed no significant difference (pre-test $M = 38.32$, $SD = 3.18$; post-test $M = 38.08$, $SD = 2.93$), $t(24) = 0.29$, $p = 0.78 > 0.05$. These findings underscore the intervention's effectiveness in improving coordination and strength levels among participants in the experimental group compared to the control group, with p-values indicating the probability of these outcomes occurring by chance. Figure 1 and 2 shows the mean value of coordination and strength.



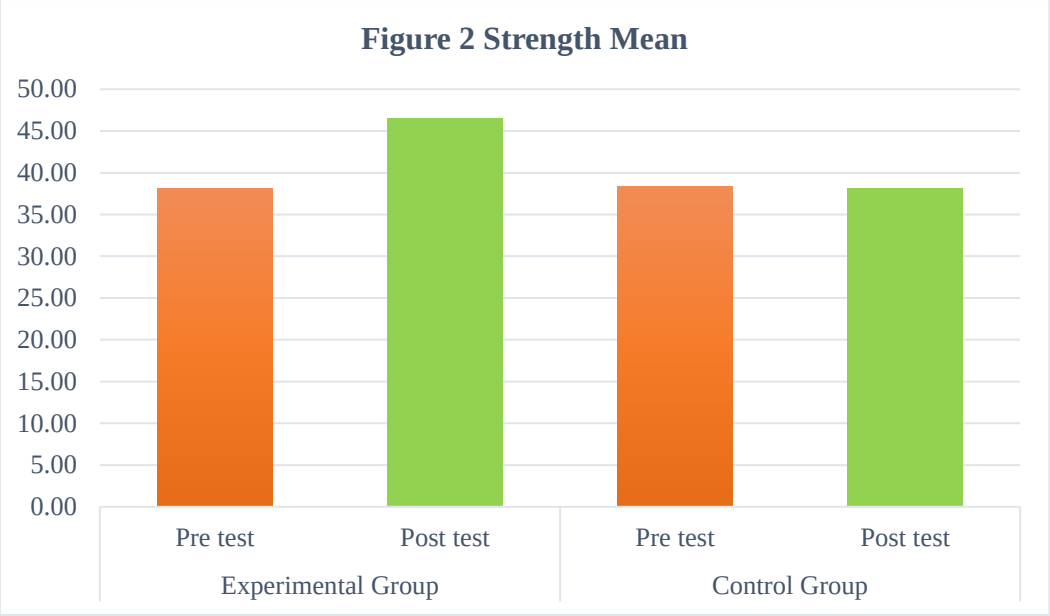


Table 2 presents the results of ANCOVA conducted on coordination and strength between experiment and control group.

Coordination						
Group	Adjusted Post test Mean	Sum of Squares	df	Mean Square	F	Sig.
Experiment Group	35.174	798.365	1	798.365	384.923	.000
Control Group	27.106	97.482	47	2.074		
Strength						
Group	Adjusted Post test Mean	Sum of Squares	df	Mean Square	F	Sig.
Experiment Group	46.563	899.346	1	899.346	131.469	.000
Control Group	38.077	321.515	47	6.841		

Table 2 outlines the findings from ANCOVA analyses, which compared coordination and strength levels between the experimental and control groups while adjusting for pre-test scores. In terms of coordination, the experimental group demonstrated a significant difference with an adjusted post-test mean score of 35.174 ($F = 384.923$, $p = 0.00 < .05$), indicating substantial improvement compared to the control group.

For strength, the experimental group displayed a significant difference with an adjusted post-test mean score of 46.563 ($F = 131.469$, $p = 0.00 < .05$), indicating notable enhancement compared to the control group.

These results underscore the effectiveness of the intervention in improving both coordination and strength among participants in the experimental group compared to the control group, even when controlling for pre-test scores.

Discussion on findings

The paired sample t-tests showed significant improvements in both coordination and strength within the experimental group, aligning with the intervention's goals. This underscores the program's effectiveness in enhancing these fitness components. Additionally, the lack of significant changes in the control group highlights the specific impact of the intervention.

Furthermore, the ANCOVA results revealed significant differences in coordination and strength between the experimental and control groups, even after accounting for pre-test scores. This statistical adjustment strengthens the evidence for the intervention's efficacy by minimizing potential confounding factors. The significant F-values indicate that the intervention group outperformed the control group, affirming the meaningful impact of the intervention on participants' physical fitness outcomes.

These findings align with previous research that has investigated similar interventions targeting coordination and strength. For instance, Myer et al. (2014) found significant improvements in coordination and strength following a neuromuscular training program in adolescent athletes. Behm et al. (2011) also reported positive effects of resistance training on strength and coordination across various populations in their meta-analysis. Additionally, Granacher et al. (2013) demonstrated improvements in coordination and strength among older adults following a 12-week training program. Together, these studies provide further support for the efficacy of interventions aimed at enhancing coordination and strength levels across diverse populations.

Conclusion

The observed improvements in coordination and strength levels among participants in the experimental group following 8 weeks of aerial yoga can be attributed to several key factors. Firstly, aerial yoga necessitates engaging multiple muscle groups simultaneously to maintain balance and stability while suspended in the air, leading to increased muscular engagement and development over time. Additionally, the practice of aerial yoga requires significant core strength to stabilize the body during various poses, which likely led to enhancements in core strength among participants. Moreover, aerial yoga challenges participants to refine their balance and proprioceptive skills, contributing to improved coordination and body awareness. The incorporation of stretching and flexibility exercises in aerial yoga routines likely facilitated improvements in flexibility and range of motion, further enhancing coordination and physical performance. Finally, the emphasis on mindfulness and relaxation techniques in aerial yoga promotes a strong mind-body connection, reducing stress and fostering greater awareness of body movements and sensations, which may have also contributed to the observed improvements. Overall, the combination of these factors underscores the effectiveness of aerial yoga as a holistic approach to improving coordination and strength levels among participants.

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