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Impact of swimming training regimen on muscular flexibility in short distance athletic players

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Abstract

Swimming involves using one's body to move through water or other fluid media. It serves various purposes, such as physical fitness, recreation, rehabilitation, and competitive sport. Swimming contributes significantly to cardiovascular endurance, muscular strength, coordination, and flexibility. The present research aimed to study the *impact of swimming training regimen on muscular flexibility* among short-distance athletic players. Young athletes aged 18-20 years from Shree Hanuman Vyayam Prasarak Mandal's Athletic Centre, Amravati, were selected as participants. A simple random group design, including a pre-test and post-test, was used. The control group continued regular activities, while the experimental group underwent a swimming training program for 60 minutes per day, six days per week, for 90 days.

Statistical analysis revealed a significant difference between control and experimental groups in the post-test results. The findings indicate that the swimming training program significantly improved muscular flexibility in short-distance athletes.

Keywords: Swimming, exercise, endurance, training, flexibility

Introduction

Swimming is a rhythmic and coordinated activity involving controlled breathing, propulsion, and body balance. The act of blowing bubbles underwater is essential for learning proper exhalation and relaxation during swimming. This rhythmic breathing technique helps in reducing tension and enhancing endurance. Swimmers are trained to exhale continuously underwater and inhale quickly when surfacing, maintaining efficient oxygen exchange and preventing carbon dioxide buildup.

Research has shown that swimming not only enhances physical capabilities but also improves mental well-being and coordination. According to Lepore, Gayle, and Stevens (2007)^[8], immersion in water up to the chest positively influences venous return, heart volume, oxygen supply, and reduces joint pressure. Kay Latto (1981) reported swimming as one of the best exercises for individuals with intellectual disabilities due to its rehabilitative and therapeutic nature. Furthermore, Jansma (1988)^[9] emphasized that swimming fosters social engagement, recreation, and long-term health benefits.

Methodology

Sources of Data

The data for this study were collected from short-distance athletic players (aged 18-20 years) at Shree Hanuman Vyayam Prasarak Mandal's Athletic Centre, Amravati.

Selection of Subjects

Thirty participants were purposively selected based on their regular athletic practice at the above-mentioned center.

Study Design

A simple random group design with a pre-test and post-test was adopted. The experimental group underwent a structured swimming training program, whereas the control group continued their regular routine. The training program lasted 60 minutes per day, six days a week, for 90 days, following a progression from simple to complex exercises.

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Test Administration: Sit and Reach Test

- **Purpose:** To measure the muscular flexibility of the subjects.
- **Equipment:** Sit-and-reach box, measuring scale.
- **Procedure:** Participants, without shoes, sat on the floor with legs extended, feet placed against the box. They were asked to reach forward along the measuring scale

without bending their knees. The farthest point reached was recorded in centimeters.

- **Scoring:** The highest value held for three seconds was taken as the final score.

Results and Statistical Analysis**Analysis of Covariance (ANCOVA) for Sit and Reach Performance**

Source of Variance	d. f.	SSX	SSY	MSSX	MSSY	FX	FY
Treatment group means	1	2.40	88.82	2.40	88.82	0.090@	5.040*
Error	58	1549.93	1022.17	26.72	17.62		

@Not Significant at 0.05, *Significant at 0.05

Tabulated $F_{0.05}(1,58) = 4.00$

The pre-test results ($FX = 0.090$) were not significant, indicating homogeneity between groups. However, the post-test ($FY = 5.040$) showed a significant difference,

suggesting improvement in flexibility for the experimental group.

ANCOVA Summary

Source of Variance	d. f.	SSX	SSY	SSXY	SSYX	MSSYX	FYX
Treatment group means	1	2.40	88.82	-14.60	112.70	112.70	69.898*
Error	57	1549.93	1022.17	1200.77	91.91	1.61	

*Significant at 0.05 level, Tabulated $F_{0.05}(1,57) = 4.00$

Since $FYX = 69.898 > 4.00$, the result confirms that the swimming training program significantly enhanced flexibility in the experimental group compared to the control

group.

Group Means

Group	N	Mx	My	Adjusted MYX
Experimental	30	7.63	11.73	11.89
Control	30	8.03	9.30	9.15

LSD Test

Experimental Group	Control Group	Mean Difference	Critical Difference
11.89	9.15	2.74*	0.66

The mean difference (2.74) exceeds the critical difference (0.66), indicating a statistically significant improvement in flexibility among participants undergoing swimming training

Conclusion

The study concludes that the swimming training regimen significantly enhances muscular flexibility in short-distance athletic players. The structured 90-day swimming program improved flexibility scores, demonstrating the value of swimming as a supplementary training method for athletes to enhance performance and reduce injury risk.

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