



A prospective study on strength and conditioning of State-Level Badminton Players

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Abstract

The purpose of this study was to examine the effect of strength and conditioning training on state-level badminton players. For the present study, thirty (N=30) badminton players between the age group of 16–24 years were purposively selected. Strength-related variables (explosive power, muscular endurance) and conditioning-related variables (agility, flexibility and VO₂ max) were assessed. An 8-week training protocol was implemented, and pre-test and post-test data were collected. Results revealed a significant improvement in performance variables, emphasizing the importance of structured strength and conditioning in badminton.

Keywords: Badminton players, Strength, Conditioning, Physical fitness, Training

Introduction

Badminton is a sport requiring high levels of agility, speed, endurance, and explosive power. Performance depends not only on technical skill but also on physical preparation. Strength and conditioning enhance power output, recovery, injury prevention, and match fitness. Previous studies in racket sports indicate that targeted conditioning improves athletic performance (Chen *et al.*, 2019; Faude *et al.*, 2007) [1, 2]. Therefore, the present study was undertaken to analyse the effect of strength and conditioning on state-level Badminton players.

Procedure and Methodology

Selection of Subjects

Thirty (N=30) state-level badminton players aged 16–24 years were purposively selected.

Selection of Variables

Strength Variables: Explosive leg power, upper body strength, muscular endurance.

Conditioning Variables: Agility, flexibility, aerobic capacity (VO₂ max).

Tools and Equipment

Standing Broad Jump (explosive power)
Push-ups/Sit-ups Test (muscular endurance)
Illinois Agility Test (agility) Sit and Reach Test (flexibility)
Cooper's 12-minute Run Test (aerobic capacity).

Purpose of the Study

The purpose of this study was to analyze the effect of a structured strength and conditioning program on the physical performance of state-level badminton players. Specifically, the study aimed to determine improvements in

explosive power, muscular endurance, agility, flexibility, and aerobic capacity (VO₂ max) following an 8-week training intervention.

Training Protocol

An 8-week training program was administered:
Warm-up & Stretching – 10 min
Plyometric drills – 15 min
Resistance training (bodyweight+weights)–20 min
Agility ladder & shuttle runs – 15 min
Cool down – 10 min
(Training conducted 5 days/week.)

Statistical Technique Employed

Data were analysed using t-test through SPSS (version 17.0).

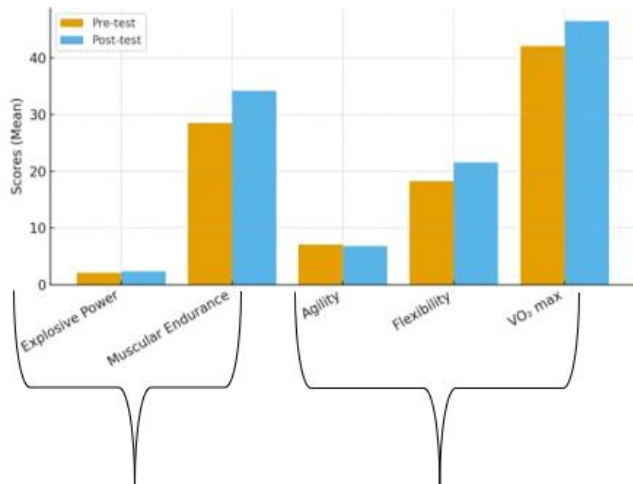
Results and Discussion

Table 1: Pre-test and Post-test Mean Values of Selected Variables (N = 30)

Variable	Pre-test Mean ± SD	Post-test Mean ± SD	t-value	p-value
Explosive Power	2.10 ± 0.24	2.38 ± 0.27	3.27	<0.05
Muscular Endurance	28.5 ± 4.6	34.2 ± 5.1	4.11	<0.05
Agility	7.12 ± 0.31	6.84 ± 0.28	2.98	<0.05
Flexibility	18.3 ± 3.5	21.6 ± 3.2	3.89	<0.05
VO ₂ max	42.1 ± 4.8	46.5 ± 5.2	4.33	<0.05

Significant at 0.05 levels

The analysis shows that all strength and conditioning variables significantly improved after training. These results align with prior studies emphasizing the necessity of systematic conditioning for badminton performance (Khan *et al.*, 2015) [3].



Strength Variables

Conditioning Variables

Fig 1: Graphical representation of pre-test and post-test mean scores

Conclusion

The findings indicate that structured strength and conditioning training significantly improves performance variables in state-level badminton players. Coaches and trainers should integrate systematic conditioning into training schedules to optimize competitive performance.

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