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TO STUDY THE EFFECT OF CUSTOMIZED TECHNICAL TRAINING ON THE ACCURACY OF SMASH PERFORMANCE OF BADMINTON PLAYERS

Smriti Nagarkoti
Research Scholar, Department of Physical Education, University of Mumbai.

Dr. Madhuri Sadgir
Associate Professor, Department of Physical Education, University of Mumbai.

ABSTRACT:

The purpose of this study was to investigate the effect of a 4-week Customised Technical Training (CTT) with progressive intensity on the accuracy of smash performance of Badminton players from Mumbai. A total of twenty badminton players from under-17 age group were randomly selected as the sample of the study. The pre-test and post-test were conducted to assess the accuracy in smash performance of badminton players. The CTT was implemented over four weeks, with five sessions per week. Paired t-test analysis revealed a statistically significant improvement in smash accuracy among under-17 badminton players, with the calculated t-value of 3.95 at ($p < 0.05$). The results indicate that customised technical training with systematically increased intensity significantly improves smash performance accuracy in under-17 badminton players.

KEYWORDS: *Customized Technical Training, Smash Accuracy, Paired t-test, Fitness Components.*

INTRODUCTION

Badminton is characterized by intermittent high-intensity actions that demand a blend of speed, quickness, muscular endurance, and power. The sport's complex and dynamic nature requires athletes to execute rapid neuromuscular responses and maintain high levels of agility to effectively adapt to unpredictable gameplay (Chow, Jia Yi et.al., 2013). Performance in badminton is heavily influenced by the ability to execute precise strokes, footwork, and strategies under varying levels of pressure and speed. The primary skills in badminton can be categorized into technical skills, tactical skills, and movement skills (footwork and positioning). (Guillaume Laffaye and Michael Phomsoupha, 2015)

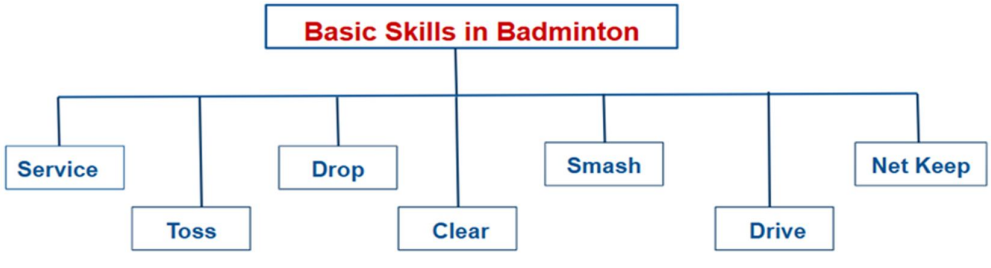

Fig. 1: Skills in Badminton

Badminton skills are multifaceted and require continuous practice, feedback, and refinement. From mastering basic strokes like the clear and drop shot to advanced techniques like deception and tactical play, each skill plays a vital role in a player's competitive success. The integration of technical expertise along with the reactive footwork, and rapid visual-motor responses enabling players to anticipate and execute precise actions under pressure.

Among the diverse array of technical skills in badminton, the smash represents a decisive offensive maneuver that profoundly influences rally dynamics and match outcomes. The success of the smash hinges not only on the generation of maximal power but also on the precision of shot placement, temporal execution, and refined biomechanical technique, underscoring the complex, integrative demands of elite performance.

The smash is a high-velocity shot aimed at concluding rallies by exploiting the opponent's defensive vulnerabilities. A well-executed smash can be a game-changer, but inaccuracies can lead to unforced errors, providing opponents with scoring opportunities. Therefore, improving smash accuracy is paramount for competitive success.

Based on the objective of the study the researcher adopted a blended training approach aimed at improving both the technical execution of the smash and the underlying factors contributing to enhanced smash accuracy. Consequently, a customized training program was adopted to address these multifaceted components

OBJECTIVE :

To compare the mean score of Smash accuracy performance of under-17 Badminton players before and after the customized technical training.

MATERIALS AND METHODOLOGY

Participants:

Twenty active badminton players from the under-17 age group were administered as a sample for the study. These individuals are registered players at the Jitesh Padukone Shuttlers Badminton Academy (JPSB), a renowned institution dedicated to nurturing badminton talent across India, Mumbai.

Design and Procedure of the Study

A single-group pre-test–post-test design was employed to evaluate the impact of the training intervention. The intervention was implemented over a four-week period, consisting of five sessions per week, with each session progressively increasing in duration from 60 to 80 minutes. Pre- and post-assessments were conducted to measure the effect of the customised technical training (CTT) on smash execution accuracy in under-17 badminton players.

The four-week customised technical training program was systematically organised into three distinct phases: a warm-up phase designed to prepare the players both physiologically and psychologically for the training load in the main phase; a main training phase aimed at enhancing the accuracy in the smash execution through a blend of specific fitness components and technotactical actions integrated into customised drills; and a cool-down phase intended to facilitate recovery and reduce muscular fatigue.

Week 1: Training Schedule

Week 1 training emphasized on the basic smash technique and placement, combined with the speed and reaction time training. Players engaged in daily 60-minute sessions, consisting of a 15-minute warm-up, 30 minutes of focused technical and motor fitness drills, and a 15-minute cool-down. Technical drills included Shadow Smash, Target Smash, and Footwork-to-Smash movement sequences to reinforce proper mechanics and shot accuracy. Simultaneously, motor fitness was developed through agility-based exercises such as ladder drills, reaction ball drills, and shuttle runs. Each drill involved 8 to

10 repetitions per set, performed over 3 to 4 sets, with 2-minute rest intervals. The training was designed to facilitate neuromotor learning, strengthen technical execution at controlled intensity, and improve reaction speed and movement efficiency within game-specific contexts.

Week 2: Training Schedule

Week 2 focused on controlled smash execution combined with dynamic movement and upper-body strength development. Training duration was extended to 70 minutes to accommodate additional strength and integrated drills. Technical training involved multi-shuttle feeding drills for continuous smash repetition and accuracy targeting across five designated court zones. Strength conditioning incorporated resistance band smashes, push-ups paired with medicine ball throws, and a structured upper-body circuit. These exercises were selected to enhance explosive power in the shoulders, arms, and core, critical for producing accurate and forceful smashes during dynamic play.

Week 3: Training Schedule

Week 3 emphasized Smash execution under pressure, simulating game scenarios and incorporating speed and explosiveness. The duration increased to 75 minutes, aligning with higher-intensity workloads. Players were challenged through fast feed and decision-making smash drills, which tested their timing, control, and choice of target under real-time stimuli. Plyometric training (box jumps, sprint circuits) was used to develop explosive movement and in-game responsiveness. Each day blended technical accuracy with physical pressure to simulate match conditions and cognitive fatigue, ensuring skill transfer to actual play.

Week 4: Training Schedule

Week 4 culminated in match simulation, smash accuracy analysis, and full-body strength integration, lasting 80 minutes per session. Players engaged in structured match-play simulations (games to 11 points), followed by data-driven accuracy charting, where smash consistency and effectiveness were recorded for feedback. Drills such as weighted racket swings, sprint with jump smash, and final evaluations were included to monitor peak performance. The motor fitness focus shifted toward circuit-based strength routines and advanced recovery protocols, ensuring readiness and reduced injury risk.

This program stood apart from conventional models by systematically layering technical elements, strength-building, and tactical understanding. The methodology emphasized correction, repetition, and progression, ensuring long-term improvement in both skill and confidence. This tailored approach offered measurable outcomes in terms of improved smash accuracy, controlled execution, and strategic placement, setting it apart from generic game-based programs, which often lack specific performance targets and individualized feedback mechanisms.

A paired sample t-test was used to compare the Pre-test and Post-test data for Smash Accuracy Performance of Badminton players. Statistical significance was set at $p < 0.05$.

RESULT

Table 1 indicates that the 't' value is found to be 3.95 for 19 degrees of freedom at 0.05 level. Hence, the calculated t-value is higher than the table value (2.093). It reflects that there is a significant difference in mean score of pre and post-test performance of customized technical training on smash accuracy of badminton players.

Table: 1
The mean scores of pre- and post-test of Smash Accuracy in Badminton

Testing	Numbers	Mean	Std. Deviation	SEM	df	t-value	Level of Significance (2-tailed)
Pre-test	20	63.15	8.80	1.97	19	3.95	Significant at < 0.01
Post-test	20	74	8.56	1.91			

Significant at 0.05 level of confidence

TESTING HYPOTHESES

The study formulated null and alternative hypothesis as the treatment duration was 4 weeks, The hypothesis are as below:

1. H_0: There is no significant difference in mean scores of Smash Accuracy before and after the customized Technical Training of under-17 badminton players
2.

$$H_0: PI = P2$$

The researcher has stated the following alternative hypothesis in case the null hypothesis rejected.

2. H_1: There is a significant difference in mean scores of Smash Accuracy before and after the Customized Technical Training of under-17 badminton players.

$$H_1: PI \neq P2$$

As presented in Table 1, the critical t-value for 19 degrees of freedom (df = N − 1) at the 0.05 level of significance is 2.093. The obtained t-value of 3.95 exceeds this threshold, indicating that the difference observed is statistically significant. Hence, the null hypothesis was rejected and alternative hypothesis was accepted, indicating that the observed difference between the pre-test and post-test mean scores in smash accuracy among badminton players is as effect of the 4 weeks customized technical training.

DISCUSSION

This study investigated the impact of a four-week customized technical training program on smash accuracy, the primary dependent variable. Participants underwent training sessions five days per week, with session durations progressively increasing from 60 to 80 minutes to facilitate gradual adaptation. The intervention comprised targeted drills aimed at improving smash technique and accuracy, integrated with motor fitness components such as speed and strength. A total of 20 structured training sessions were implemented, each consisting of warm-up, main training exercises, and cool-down phases. Standardised skill tests were administered both prior to and following the intervention to quantitatively measure performance changes.

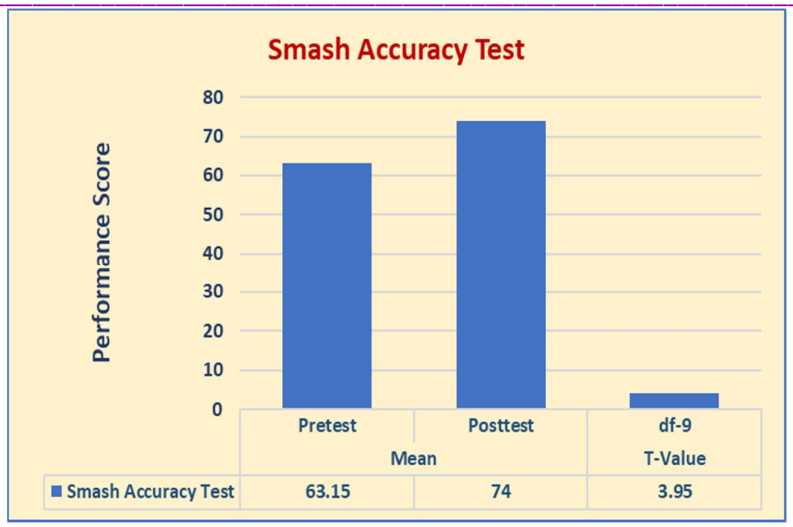

Fig.1 Graphical Representation of pre- and post-test mean and t-value of Smash Accuracy test

Statistical analysis using a paired sample t-test revealed a statistically significant improvement in smash accuracy post-intervention. These findings substantiate the efficacy of the customized technical training program in enhancing both the precision and execution of the badminton smash.

CONCLUSIONS

Considering the limitations inherent in this experiment, the investigator is justified in drawing the following conclusion:

Based on the findings, it is concluded that four weeks of customized technical training significantly improved the performance of smash accuracy in under-17 badminton players at the Jitesh Padukone Shuttlers Badminton Academy (JPSB) from Mumbai.

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