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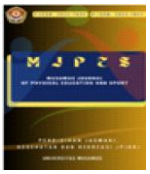

Effects of Right–Left Smash and Smash–Netting Pattern Drills on Badminton Smash Accuracy: A Two-Group Pretest–Posttest Study

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Abstract

Objectives: This study compared the effects of right–left smash pattern drills and smash–netting pattern drills on badminton smash accuracy in adolescent club athletes.

Materials and Methods: A two-group pretest–posttest design was used. Twelve male athletes aged 15–17 years from PB Samudra Binjai were selected purposively and allocated by ordinal pairing to a right–left smash group (n = 6) or a smash–netting group (n = 6). Both groups completed 12 training sessions. Smash accuracy was assessed using the PBSI smash accuracy test. Paired-samples t tests evaluated within-group changes, and an independent-samples t test compared gain scores.

Results: Right–left training increased mean accuracy from 12.00 ± 3.29 to 16.00 ± 1.79 points (mean gain 4.00 ± 1.67; $t(5) = 5.86$, $p = 0.002$). Smash–netting training increased the mean from 11.83 ± 2.64 to 17.17 ± 2.23 points (mean gain 5.33 ± 0.82; $t(5) = 16.00$, $p < 0.001$). Although the smash–netting group had a larger descriptive gain, the between-group difference in gain scores was not statistically significant ($t(10) = 1.75$, $p = 0.110$).

Conclusions: Both drill patterns were associated with significant within-group improvements in smash accuracy. The data did not establish the statistical superiority of either drill. Larger randomized studies with a non-training control, standardized training dosage, and retention testing are needed.

Keywords: badminton; pattern drill; skill accuracy; smash; youth athletes

Introduction

The badminton smash is an attacking stroke intended to send the shuttle steeply and rapidly into the opponent's court. Successful execution depends on stroke mechanics, timing, body positioning, perceptual control, and the ability to recover for the next action. Because match situations rarely present an identical shuttle twice, training must develop both consistent contact and adaptable movement patterns.

Repetitive feeding and pattern drills can increase the number of technically focused attempts within a session. Multi-shuttle training has been associated with improvements in badminton skill development among young players (Li & Hongsaenyatham, 2023). Nevertheless, training specificity matters: a drill that repeatedly links movement, stroke preparation, impact, and recovery may transfer differently from one that adds a net response after the smash. Representative observation of badminton also emphasizes that performance comprises linked actions rather than isolated strokes (Torres-Luque et al., 2020).

Right–left smash drills require athletes to reposition laterally before repeated overhead attacks. Smash–netting drills combine a rear-court attack with forward movement and a net response, thereby adding transition and recovery demands. Footwork-oriented training is relevant because dynamic balance and movement control contribute to efficient court coverage; balance training has improved badminton-specific physical performance and footwork outcomes in competitive players (Malwanage et al., 2022).

The original study compared these two practical coaching methods in athletes from PB Samudra Binjai. This revision aimed to quantify within-group changes and directly test whether gain scores differed between groups. It was hypothesized that both groups would improve and that the smash–netting pattern might produce a larger gain because it integrates attack, recovery, and forward movement.

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Materials and Methods

Study Design and Participants

A quasi-experimental two-group pretest–posttest design was used. The participants were 12 male badminton athletes aged 15–17 years from PB Samudra Binjai, Indonesia. Purposive sampling was followed by ordinal pairing based on pretest performance, producing two groups of six athletes. The source manuscript did not report training age, competitive level, inclusion or exclusion criteria, injuries, attendance, or an a priori sample-size calculation; these details should be added from the original records.

Interventions

Group A performed right–left smash pattern drills, involving repeated lateral positioning and smash execution. Group B performed smash–netting pattern drills, linking smash execution with forward movement and a net shot. Each intervention comprised 12 sessions. The archived manuscript did not specify sessions per week, duration, repetitions, work-to-rest ratio, shuttle-feed consistency, progression, coach supervision, or whether other training was controlled. These parameters must be restored before submission to permit replication.

Outcome Measure

Smash accuracy was measured before and after training using the PBSI smash accuracy test. Higher scores indicated greater accuracy. The source manuscript did not provide the target-zone diagram, number of attempts, scoring boundaries, warm-up, assessor blinding, or a complete primary citation for the instrument's reliability and validity. These procedural and psychometric details should be verified and inserted.

Statistical Analysis

Means and sample standard deviations were calculated from the 12 individual pretest and posttest scores supplied in the manuscript. Within-group change was tested using two-tailed paired-samples t tests. Gain scores (posttest minus pretest) were compared with a two-tailed independent-samples t test assuming equal variances. Cohen's dz was calculated for paired changes. Statistical significance was set at $p < 0.05$. Percentage change was calculated as mean gain divided by the pretest mean × 100.

Ethical Considerations

The source manuscript did not report institutional ethics approval, club authorization, parental consent, participant assent, confidentiality procedures, or adverse-event monitoring. Because participants were minors, these details must be verified and reported before submission. No identifying participant data are presented here.

Results

The groups had nearly identical baseline mean scores (12.00 versus 11.83 points; $p = 0.925$). Both groups improved significantly from pretest to posttest. The right–left group gained 4.00 points (33.3%), whereas the smash–netting group gained 5.33 points (45.1%).

Table 1. Descriptive statistics for smash accuracy

Group	n	Pretest, mean ± SD	Posttest, mean ± SD	Gain, mean ± SD
Right–left smash	6	12.00 ± 3.29	16.00 ± 1.79	4.00 ± 1.67
Smash–netting	6	11.83 ± 2.64	17.17 ± 2.23	5.33 ± 0.82

Table 2. Inferential tests of changes in smash accuracy

Comparison	t	df	p	Effect size
Right–left: post vs pre	5.86	5	0.002	dz = 2.39
Smash–netting: post vs pre	16.00	5	<0.001	dz = 6.53
Between-group gain	1.75	10	0.110	—

The direct comparison of gain scores was not statistically significant. Therefore, the larger mean and percentage gain in the smash–netting group should be interpreted descriptively and does not demonstrate that this drill was superior.

Discussion

The principal finding was that smash accuracy increased significantly within both training groups after 12 sessions. This result is consistent with the general principle that repeated, task-specific practice can improve badminton skills. Li and Hongsaenyatham (2023) similarly reported beneficial effects of multi-ball practice on badminton skill outcomes in young players. Repeated shuttle exposure may allow athletes to refine preparation, contact point, direction control, and movement timing while receiving a high volume of attempts.

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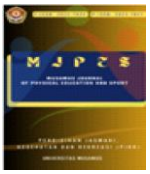

The right–left pattern produced a substantial within-group gain. Alternating lateral positions likely required athletes to coordinate footwork with overhead stroke preparation rather than practise the arm action from a fixed position. This interpretation aligns with findings that balance-oriented training can improve dynamic balance and badminton footwork-related performance (Malwanage et al., 2022). It also accords with Chau's (2020) observation that systematic assessment and training can support the development of fundamental badminton techniques, although the population and outcome measures differed from those in the present study.

The smash–netting group showed the larger descriptive gain. A plausible explanation is that linking a rear-court attack to forward recovery increased movement variety and required athletes to reorganize balance after the smash. However, this mechanism was not measured. Badminton observation frameworks show that strokes occur in sequences shaped by court location and preceding actions (Torres-Luque et al., 2020); consequently, a linked pattern may offer a more representative transition than isolated repetition. The result should still be treated cautiously because the gain difference did not reach statistical significance.

The findings also resemble evidence that both fixed and varied shuttle-feeding approaches can improve smash accuracy, with practice structure influencing the nature of adaptation (Prasojo & Yahya, 2017). Variation can promote adjustment to changing spatial demands, whereas repetition can stabilize technique. Coaches may therefore use right–left drills for lateral repositioning and repeated attack, and smash–netting drills for attack-to-front-court transition, selecting the drill according to the athlete's technical need rather than assuming universal superiority.

Smash accuracy is not determined by practice structure alone. Core strength training has shown positive effects on badminton performance indicators in a recent meta-analysis (Ma et al., 2024), and visual-reaction training has improved reaction-related performance in badminton players (Kuo et al., 2022). These studies suggest that stroke accuracy may benefit from an integrated program combining technical repetition with postural control, perception, and rapid movement. The present experiment did not isolate these components.

The very large paired effect sizes must be interpreted in light of the small samples and absence of a no-training control. Familiarization with the test, normal club practice, maturation, or regression to the mean could have contributed to pre–post changes. Ordinal pairing can improve baseline balance, but it is not equivalent to concealed random allocation. The non-significant between-group test is the appropriate basis for comparative inference; percentage increases alone cannot establish superiority.

Practical Implications

Coaches can use both patterns as complementary drills. Right–left repetitions may emphasize lateral recovery and stable overhead contact, whereas smash–netting sequences may emphasize transition toward the forecourt. Training load, feed placement, repetitions, rest, and technical cues should be standardized and progressively adjusted. Accuracy should be reassessed with the same protocol, and future evaluation should include retention and transfer to rally or match conditions.

Limitations

The study included only 12 male athletes from one club, had no inactive control group, and did not report random allocation or assessor blinding. Training dosage and adherence were insufficiently documented, and the measurement protocol and psychometric evidence were incomplete. Potential confounders such as additional training, playing experience, physical fitness, and maturation were not controlled. The study measured immediate test performance rather than retention or match effectiveness. These limitations constrain generalizability and causal interpretation.

Conclusions

Twelve sessions of either right–left smash pattern drills or smash–netting pattern drills were associated with significant improvements in badminton smash accuracy. The smash–netting group achieved a larger descriptive mean gain (5.33 versus 4.00 points), but the difference between group gains was not statistically significant ($p = 0.110$). Accordingly, the evidence supports both drills as potentially useful practice options but does not establish one as superior. A larger randomized controlled study with fully standardized interventions and retention testing is warranted.

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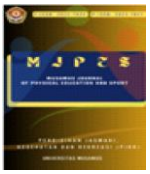
Author Contributions

Lutfi Ansari Darma: conceptualization, investigation, data collection, and writing—original draft. Eka Abdurrahman: methodology, analysis, interpretation, supervision, and writing—review and editing. Both authors approved the final manuscript.



Conflict of Interest

The authors declare no conflict of interest.

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This research received no external funding.

Data Availability

The individual pretest and posttest scores analyzed in this revision are reported in the source study. De-identified supporting data may be made available by the corresponding author, subject to ethical and institutional requirements.

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