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CHANGES IN SOCCER DRIBBLING PERFORMANCE AFTER FOUR WEEKS OF ZIG-ZAG DRILLS

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Abstract

This study quantified changes in timed dribbling performance among Panjimas FC players after four weeks of zig-zag dribbling drills. A one-group pretest–posttest design included all 18 active players. Participants completed a timed course around eight cones before and after the program. Training comprised 3–5 sets per session, two minutes of recovery between sets, and 10–30 minutes of drill work. Paired scores were analyzed with a paired-samples t test. Mean completion time decreased from 19.139 ± 0.554 to 17.428 ± 0.525 s. The mean reduction was 1.711 s (95% CI 1.673–1.749), $t(17)=95.724$, $p<.001$, equivalent to an 8.94% improvement. The standardized paired effect was exceptionally large ($d_n=22.56$). Timed dribbling performance improved during the four-week program. The absence of a control group, incomplete training-dose information, and the unusually uniform individual changes preclude attributing the improvement solely to the drills and warrant verification of the raw data.

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INTRODUCTION

Dribbling allows a football player to retain possession, progress into space, escape pressure, and create attacking opportunities. Successful execution combines close ball control with acceleration, balance, perceptual decisions, and rapid changes of direction. It is therefore a context-dependent technical action rather than a simple running task. Reviews of association-football performance emphasize that technical actions must be interpreted alongside tactical and physical demands (Sarmiento et al., 2018; Clemente et al., 2021).

Zig-zag drills reproduce one component of this demand by requiring repeated directional changes while the player controls the ball around obstacles. Their low



equipment requirement makes them attractive to amateur clubs. Repeated practice can improve course familiarity, foot-ball coordination, and the ability to regulate stride length before a turn. However, planned change-of-direction tasks do not reproduce the perceptual uncertainty of an opponent, and agility and pre-planned change-of-direction speed should not be treated as identical constructs (Young et al., 2015).

Several Indonesian studies have reported better timed dribbling after zig-zag or related drills. Pratama (2020) observed a reduction from 19.59 to 17.83 s, Pamungkas (2021) reported a 14% improvement with zig-zag practice, and Frananda et al. (2023) found improvement after weighted zig-zag running. Comparative work suggests that both zig-zag running and small-sided games may be beneficial, although the latter can provide a more representative decision-making environment (Marda et al., 2024). These results are promising, but many studies use small samples and uncontrolled pre-post designs.

At Panjimas FC, coaching observations indicated inconsistent ball control and slow directional changes, while technical dribbling practice was not routinely structured. Evidence from village-level amateur clubs remains limited. The present study therefore quantified the pre-post change in a timed zig-zag dribbling test after four weeks of drill practice. We hypothesized that post-program completion time would be lower than baseline time.

METHOD

Design, Setting, and Participants

A quantitative one-group pretest-posttest design was used at the Suralaga public football field, East Lombok, during May 2026. All 18 active Panjimas FC players were included by total sampling. The source manuscript did not report age, sex, playing position, training experience, eligibility criteria, injury status, consent procedures, or ethics approval. These characteristics should be added before journal submission because they affect interpretation and research transparency.

Dribbling Test

Timed performance was assessed on a zig-zag course adapted from Irianto's field test. Eight cones formed the prescribed route, and participants controlled the ball with their feet while completing the course as quickly as possible. Each player received two or three attempts, and the fastest valid time was retained using a handheld stopwatch. An attempt was invalid if the route or cone order was not followed or the ball was contacted with a body part other than the feet. The manuscript states that content validity was reviewed by a lecturer and a football coach and that test-retest reliability was examined, but it does not report the reliability coefficient, cone spacing, course length, timing resolution, trial recovery, tester number, or tester agreement.

Training Program

The four-week intervention consisted of ball dribbling through zig-zag cone arrangements. Each session included a warm-up, 3–5 drill sets, two minutes of recovery between sets, 10–30 minutes of drill activity, and a cool-down. The source record does not specify sessions per week, total sessions, repetitions or distance per set, progression, surface conditions, attendance, additional team training, or coaching feedback. These details must be recovered from training logs and should not be invented.

Statistical Analysis

Means, standard deviations, and ranges summarized completion time. The manuscript reports Shapiro–Wilk tests separately for pretest and posttest scores, although the paired *t* test assumes normality of the within-player differences. A paired-samples *t* test evaluated mean change at $\alpha=.05$. The 95% confidence interval, percentage improvement, and standardized paired effect ($d_n=t/\sqrt{n}$) were reconstructed from the reported statistics (Lakens, 2013). No raw data were available for independent checks of outliers, the distribution of change scores, or data-entry accuracy.

RESULTS

All 18 players were included in the reported analysis. Mean completion time decreased by 1.711 s, from 19.139 to 17.428 s, representing an 8.94% improvement relative to baseline. Dispersion was similar at both time points (Table 1). The baseline range reported in Table 1 (18.3–20.1 s) conflicts with the 21.03–25.25 s range described in the introductory observation; the underlying records should be reconciled before submission.

Table 1.
Timed zig-zag dribbling performance

Measurement	n	Mean (s)	SD (s)	Minimum	Maximum
Pretest	18	19.139	0.554	18.3	20.1
Posttest	18	17.428	0.525	16.7	18.4

The reported Shapiro–Wilk results were $W=.960$, $p=.611$ for pretest and $W=.943$, $p=.330$ for posttest. These values do not test the normality of paired differences, so the test assumption remains incompletely documented.

Table 2.
Reported Shapiro–Wilk results

Variable	W	df	p
Pretest	.960	18	.611

Posttest	.943	18	.330
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The paired test yielded $t(17)=95.724$, $p<.001$. Mean improvement was 1.711 s (95% CI 1.673–1.749), and the reported SD of the paired differences was only 0.0758 s. This produced an exceptionally large d_n of 22.56 (Table 3). Such uniform change is statistically possible but unusual in field testing and should be checked against participant-level data, stopwatch precision, and spreadsheet formulas.

Table 3.

Paired comparison of dribbling time

Contrast	Mean reduction (s)	95% CI	SD change	t (df)	p	d_n
Pretest–posttest	1.711	1.673–1.749	0.0758	95.724 (17)	<.001	22.56

DISCUSSION

Timed dribbling performance improved during the four-week program, with an average reduction of 1.711 s. The direction and magnitude of the raw-time change are consistent with repeated practice of the same movement pattern: players rehearsed controlling the ball while negotiating planned turns and were reassessed on a closely related timed course. The improvement is practically noticeable, amounting to 8.94% of the baseline mean.

The direction of change agrees with previous zig-zag studies. Pratama (2020) reported a 1.76-s reduction after zig-zag and dribbling variations, while Pamungkas (2021) found a 14% improvement and Frananda et al. (2023) observed better dribbling scores after weighted zig-zag practice. Apraja et al. (2023) and Alimsyah and Rahmi (2025) also reported improvements in school-based samples. The current result extends this pattern to a small amateur village club, but it cannot establish that the response generalizes beyond Panjimas FC.

The likely mechanism is task-specific practice. Repeated cone negotiation may refine touch frequency, approach steps, body inclination, and braking before each turn. Broader evidence indicates that speed–agility–quickness training can improve change-of-direction dribbling (Sun et al., 2025), while physical programs can enhance change-of-direction capacity in football players (Pardos-Mainer et al., 2021; Zheng et al., 2025). Yet a closed cone course is less representative of competition than practice requiring perception and choice. Small-sided games provide frequent technical actions under pressure and may complement isolated drills (Clemente et al., 2021; Marda et al., 2024).

The standardized effect requires special caution. A d_n of 22.56 is driven by the extremely small SD of paired changes, not only by the 1.711-s mean reduction.

It implies that almost every player improved by nearly the same amount. This may reflect a highly consistent response, but it may also indicate rounding, copied values, a formula error, or a strong test-familiarization effect. The use of the fastest of two or three trials further favors improvement if players became more familiar with the course or pacing strategy. Participant-level scores should therefore be audited before the statistic is presented to reviewers.

The design also limits causal interpretation. Without a non-drill comparison group, ordinary club training, maturation, motivation, repeated testing, and coach attention cannot be separated from the intervention. Training dosage is insufficiently documented, and the normality assessment was applied to each occasion rather than the paired differences. The field test's reliability coefficient and protocol geometry were not reported, preventing evaluation of whether the observed change exceeded measurement error.

For coaching practice, zig-zag drills are inexpensive and can be used for early technical rehearsal. Progression should manipulate cone distance, speed, weaker-foot use, visual scanning, and defensive pressure, while keeping ball control as the priority. Coaches should then transfer the skill into opponent-based and small-sided tasks. Future controlled studies should prespecify training dose, use electronic timing where possible, report test reliability and raw change distributions, and include retention and match-relevant outcomes.

CONCLUSION

The 18 Panjimas FC players completed the posttest 1.711 s faster on average after four weeks of zig-zag dribbling practice (95% CI 1.673–1.749), corresponding to an 8.94% improvement. The reported paired test was statistically significant, $t(17)=95.724$, $p<.001$. The result supports the practical use of structured zig-zag drills, but the uncontrolled design does not establish causation. The exceptionally uniform changes and resulting $d_n=22.56$ should be verified against the raw data before submission.

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