



Optimización de la condición física y el rendimiento técnico mediante minijuegos de fútbol 3v3 y 4v4

Optimizing Physical Fitness and Technical Performance through 3v3 and 4v4 Mini Soccer Games

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Abstract

Background: Small-Sided Games (SSGs) have been widely implemented in football training because they simultaneously integrate physical and technical demands within game-based situations. However, evidence directly comparing the effectiveness of 3v3 and 4v4 formats among non-professional university football players remains limited.

Purpose: This study compared the effects of 3v3 and 4v4 Small-Sided Games on physical fitness and technical performance in university football players.

Methods: A quasi-experimental study with a nonequivalent comparison group design was conducted involving 27 male university football players allocated into a 3v3 group ($n = 13$) and a 4v4 group ($n = 14$) using ordinal pairing. Both groups completed a six-week intervention (16 sessions). Physical fitness was assessed using the Multistage Fitness Test and the 30-m sprint test, while technical performance was evaluated through passing, dribbling, and shooting tests. Data were analyzed using paired-samples and independent-samples t-tests with a significance level of $p < 0.05$.

Results: Both training formats produced significant improvements in all physical fitness and technical performance variables ($p < 0.05$). The 3v3 group improved endurance (11.86 ± 0.94 to 12.57 ± 0.75), sprint performance (5.03 ± 0.11 to 4.98 ± 0.10 s), passing (14.53 ± 2.75 to 17.00 ± 2.08), dribbling (6.65 ± 0.46 to 6.42 ± 0.42 s), and shooting (17.84 ± 1.99 to 20.00 ± 1.95). Similarly, the 4v4 group demonstrated improvements in endurance (10.90 ± 1.23 to 11.84 ± 1.04), sprint performance (5.09 ± 0.11 to 4.89 ± 0.09 s), passing (14.57 ± 2.97 to 19.35 ± 3.56), dribbling (6.75 ± 0.46 to 6.08 ± 0.42 s), and shooting (17.35 ± 3.24 to 21.92 ± 2.78). Post-intervention comparisons indicated significant differences between groups across all outcome variables ($p < 0.05$), with the 4v4 format demonstrating greater overall improvements.

Conclusions: Both 3v3 and 4v4 Small-Sided Games effectively enhanced physical fitness and technical performance in university football players. Although both formats were beneficial, the 4v4 format produced greater overall improvements across the measured outcomes, indicating its potential as an effective training strategy for non-professional university football players.

Keywords

Small-Sided Games; Football Training; Physical Fitness; Technical Skills; University Athletes

Resumen

Antecedentes: Los juegos reducidos (SSG) se han implementado ampliamente en el entrenamiento de fútbol debido a que integran simultáneamente las exigencias físicas y técnicas en situaciones de juego. Sin embargo, la evidencia que compara directamente la efectividad de los formatos 3v3 y 4v4 entre jugadores universitarios no profesionales de fútbol sigue siendo limitada.

Objetivo: Este estudio comparó los efectos de los juegos reducidos 3v3 y 4v4 sobre la condición física y el rendimiento técnico en jugadores universitarios de fútbol.

Métodos: Se realizó un estudio cuasiexperimental con un diseño de grupo de comparación no equivalente, en el que participaron 27 jugadores universitarios de fútbol masculinos, asignados a un grupo 3v3 ($n = 13$) y a un grupo 4v4 ($n = 14$) mediante emparejamiento ordinal. Ambos grupos completaron una intervención de seis semanas (16 sesiones). La condición física se evaluó mediante la Prueba de Aptitud Física Multietapa y la prueba de sprint de 30 m, mientras que el rendimiento técnico se evaluó mediante pruebas de pase, regate y tiro. Los datos se analizaron mediante pruebas t para muestras pareadas e independientes con un nivel de significancia de $p < 0,05$.

Resultados: Ambos formatos de entrenamiento produjeron mejoras significativas en todas las variables de aptitud física y rendimiento técnico ($p < 0,05$). El grupo 3v3 mejoró la resistencia (de $11,86 \pm 0,94$ a $12,57 \pm 0,75$), el rendimiento en sprint (de $5,03 \pm 0,11$ a $4,98 \pm 0,10$ s), los pases (de $14,53 \pm 2,75$ a $17,00 \pm 2,08$), el regate (de $6,65 \pm 0,46$ a $6,42 \pm 0,42$ s) y los tiros (de $17,84 \pm 1,99$ a $20,00 \pm 1,95$). De manera similar, el grupo de 4 contra 4 demostró mejoras en resistencia (de $10,90 \pm 1,23$ a $11,84 \pm 1,04$), rendimiento en sprint (de $5,09 \pm 0,11$ a $4,89 \pm 0,09$ s), pases (de $14,57 \pm 2,97$ a $19,35 \pm 3,56$), regate (de $6,75 \pm 0,46$ a $6,08 \pm 0,42$ s) y tiros (de $17,35 \pm 3,24$ a $21,92 \pm 2,78$). Las comparaciones posteriores a la intervención indicaron diferencias

significativas entre los grupos en todas las variables de resultado ($p < 0,05$), con el formato de 4 contra 4 demostrando mayores mejoras generales. Conclusiones: Tanto los partidos reducidos de 3 contra 3 como los de 4 contra 4 mejoraron

eficazmente la condición física y el rendimiento técnico en jugadores de fútbol universitario. Si bien ambos formatos resultaron beneficiosos, el formato 4 contra 4 produjo mayores mejoras generales en todos los resultados medidos, lo que indica su potencial como estrategia de entrenamiento eficaz para jugadores de fútbol universitario no profesionales.

Palabras clave

Juegos Reducidos; Entrenamiento De Fútbol; Aptitud Física; Habilidades Técnicas; Atletas Universitarios

Introduction

Football is a team sport that requires an integrated combination of physical, technical, tactical, and cognitive skills in a complex dynamic game context (Karpa, 2021; Sumartiningsih et al., 2022). Players not only need physical capabilities like speed, stamina, strength and concentration but also have to master basic techniques like passing, dribbling, shooting and ball control. Additionally, a good performance in football usually depends on how quickly and accurately QDP make decisions under uncertain times and spaces (Moch Fath Khurrohman et al., 2021; Nurcahyo et al., 2021). As a result, soccer practice needs to use a combined method that enhances physical, technical, tactical, and mental skills in situations that reflect the actual game.

Recent developments in sports training science suggest an overarching shift away from compartmentalized training models that separate physical and technical components to approaches based on more integrated, contextual, and game-like situations (Hidayah et al., 2024). Within these, Small-Sided Games (SSG) have been widely researched over the last 20 years. SSG refers to modified versions of the game, a smaller format of the game with less players and more restrictive pitch dimensions designed specifically to increase intensity levels, promote a larger proportion of players involved in play and generate greater amounts of decision making opportunity (Fernández-Espínola et al., 2020; Owen et al., 2004). This method allows coaches to adjust the training intensity while maintaining the tactical and technical aspects of game play.

The latest literature indicates that SSG offers benefits over traditional training methods. 3v3 and 4v4 formats have been demonstrated to lead to a greater number of ball touches, sprinting frequency, bouts of high-intensity actions, pressing performance and decision making under pressure, thus better simulating match play (Silva et al., 2022). In addition, differences in design, such as football pitch size or number of players embeded by the rules (Coutinho et al., 2022) enable coaches to focus on specific performance areas. For instance, individual technical engagement and high-intensity play is typical with 3v3 games, while 4v4 formats help to further tactical development, positional rotations and collaborative decision making. These variations indicate that every SSG format might lead to unique training changes based on the specific performance goals.

Although earlier research has shown that Small-Sided Games (SSGs) enhance physical conditioning and technical skills, the majority of studies have focused on professional, elite academy, or youth players within tightly controlled training settings (Arslan et al., 2022; Clemente et al., 2021; Dobbin et al., 2021; Kharatzadeh et al., 2025). As a result, it is still unclear how these results apply to non-professional university football players. Student athletes typically have distinct training patterns, competitive backgrounds, and physical abilities, which might affect how they respond to training that is based on SSGs (Bonney et al., 2020; Kim et al., 2023).

In addition, prior research has often focused on just one SSG format or highlighted specific performance metrics, such as aerobic capacity or technical performance, with little comparison of various SSG formats in the same study. There is still a lack of evidence directly comparing 3v3 and 4v4 formats regarding their combined impacts on physical fitness and technical performance among university football players. Consequently, it is not yet determined which SSG format is most effective for enhancing overall performance in non-professional university athletes.

Closing this gap is crucial since college football teams often depend on traditional training approaches that keep physical conditioning apart from skill training. However, competitive football demands a mix of physical, technical, tactical, and decision-making skills. Discovering the most efficient

SSG structure could help coaches create training sessions rooted in evidence that enhance various performance aspects at the same time, all while ensuring practical relevance and training effectiveness. Hence, examining the 3v3 and 4v4 formats holds both theoretical importance in expanding SSG studies to amateur players and practical benefits for coaching at universities.

This research was designed to evaluate how 3v3 and 4v4 Small-Sided Games impact physical fitness (endurance and speed) and technical skills (dribbling, passing, and shooting) in non-professional university soccer players. The results aim to offer practical insights into the best SSG structure for enhancing various aspects of soccer performance in university environments.

Method

This study employed a quasi-experimental design with nonequivalent comparison groups to investigate the effects of two Small-Sided Games (SSG) formats (3v3 and 4v4) on physical fitness and technical performance in university football players. Since both groups received different SSG interventions rather than a true control condition, the study compared the effectiveness of two active training approaches instead of comparing an intervention with a non-intervention control group.

Twenty-seven university football players from the Football Student Activity Unit at Universitas Jenderal Soedirman were recruited through purposive sampling based on the following inclusion criteria: actively participating in regular training and official competitions, free from injury during the study period, and willing to complete the entire intervention. To minimize baseline differences between groups, participants were ranked according to their pretest scores and allocated using an ordinal pairing procedure, resulting in two groups with comparable baseline characteristics (3v3, $n = 13$; 4v4, $n = 14$). Baseline equivalence between groups was confirmed prior to the intervention.

Table 1. Baseline Characteristics of Participants

Variable	3v3 Group (n13)	4v4 Group (n14)	p-value
Age (years)	20.8 ± 0.9	20.6 ± 0.8	0.541
Height (cm)	169.5 ± 5.2	170.3 ± 4.8	0.672
Body Mass (kg)	62.8 ± 6.5	63.6 ± 5.9	0.744
BMI (kg/m ²)	21.8 ± 1.7	21.9 ± 1.6	0.883
Football Experience (years)	5.6 ± 1.8	5.4 ± 1.9	0.811
Attendance during Intervention (%)	96.2 ± 2.4	95.8 ± 2.7	0.713

Values are presented as mean ± standard deviation. Baseline comparisons were performed using independent-samples t-tests. No statistically significant differences were observed between groups ($p > 0.05$), indicating comparable baseline characteristics.

The sample size reflected the total number of eligible university football players available during the study period. Although no a priori statistical power analysis was performed, all eligible athletes who met the inclusion criteria were included to maximize statistical representation within the target population. This limitation is acknowledged in the Discussion section.

The intervention was conducted over a period of six weeks with 16 sessions. The first session was devoted to pretesting using standardized instruments, including the Multistage Fitness Test, a 30-meter sprint, a zig-zag dribbling test, a wall passing test, and a shooting accuracy test. Sessions 2 to 15 were dedicated to the SSG training program. The 3v3 group trained on a 25 × 18 meter pitch with either free touch or a maximum of three touches, performing four bouts of three minutes with three-minute recovery intervals. The 4v4 group trained on a 16 × 24 meter pitch, with or without a goalkeeper, performing four bouts of four minutes with two-minute recovery intervals. The final session was allocated for posttesting using the same instruments as in the pretest. Each training session lasted approximately 90 minutes, consisting of 15 minutes of warm-up, 60 minutes of the main training program, and 10 minutes of cool-down combined with evaluation.

Both intervention groups completed the same training frequency (16 sessions over six weeks), warm-up duration, and total session duration. The primary experimental factor was the Small-Sided Games format (3v3 versus 4v4). Differences in pitch dimensions, bout duration, recovery intervals, and goalkeeper use followed established SSG protocols reported in previous studies and were intentionally maintained to preserve the ecological characteristics of each game format. These protocol differences were considered when interpreting the findings because they may have contributed to variations in physiological and technical responses.

Outcome measures included physical fitness (endurance and speed) and technical performance (dribbling, passing, and shooting). Endurance was assessed using the Multistage Fitness Test (MLEST), whereas speed was measured using the 30-m sprint test. Technical performance was evaluated using the zig-zag dribbling test, wall passing accuracy test, and shooting accuracy test. All instruments demonstrated acceptable validity and reliability in previous studies.

All pretests and posttests were conducted on the same football field under similar environmental conditions and at approximately the same time of day. Participants completed a standardized warm-up before testing and were instructed to avoid strenuous physical activity for 24 hours before each assessment. The same evaluators administered all tests following standardized testing procedures to ensure measurement consistency and reduce observer bias.

Data were analyzed using IBM SPSS Statistics version 26. Normality and homogeneity assumptions were examined using the Shapiro-Wilk and Levene's tests, respectively. Paired-sample t-tests were used to evaluate within-group changes from pretest to posttest, whereas independent-sample t-tests compared posttest outcomes between the 3v3 and 4v4 groups. Statistical significance was established at $p < 0.05$. In addition, Cohen's d effect sizes and 95% confidence intervals were calculated to quantify the magnitude and precision of the observed effects.

Results

Descriptive Statistics

The physical fitness and technical performance of participants were assessed at pre- and post-testing with descriptive analyses. When measuring ability, the variables measured included endurance (MFT), speed (30 m sprint), passing accuracy, dribbling and shooting accuracy. Separate results are shown for the 3v3 and the 4v4 Small-Sided Games (SSG) training groups.

Table 2. Descriptive Statistics and Percentage Improvements of Physical and Technical Performance in the 3v3 and 4v4 Groups

Variable	Group	Pre-Test (Mean $\pm$ SD)	Post-Test (Mean $\pm$ SD)	Min-Max Pre	Min-Max Post	% Improvement
Endurance (MFT)	3v3	11.86 $\pm$ 0.94	12.57 $\pm$ 0.75	10.10–13.13	11.30–13.60	+5.99%
	4v4	10.90 $\pm$ 1.23	11.84 $\pm$ 1.04	9.10–12.80	10.10–13.15	+8.62%
Speed (30 m sprint, s) ↓	3v3	5.03 $\pm$ 0.11	4.98 $\pm$ 0.10	4.88–5.26	4.75–5.15	–0.99%
	4v4	5.09 $\pm$ 0.11	4.89 $\pm$ 0.09	4.91–5.27	4.70–5.10	–3.93%
Passing (score)	3v3	14.53 $\pm$ 2.75	17.00 $\pm$ 2.08	10–19	14–20	+16.98%
	4v4	14.57 $\pm$ 2.97	19.35 $\pm$ 3.56	9–19	12–24	+32.80%
Dribbling (s) ↓	3v3	6.65 $\pm$ 0.46	6.42 $\pm$ 0.42	5.86–7.38	5.85–7.13	–3.46%
	4v4	6.75 $\pm$ 0.46	6.08 $\pm$ 0.42	6.28–8.05	5.65–7.28	–9.93%
Shooting (score)	3v3	17.84 $\pm$ 1.99	20.00 $\pm$ 1.95	16–21	17–24	+12.10%
	4v4	17.35 $\pm$ 3.24	21.92 $\pm$ 2.78	13–24	18–27	+26.34%

Table 2 presents the descriptive statistics for all outcome variables before and after the six-week intervention. Both groups demonstrated improvements across physical fitness and technical performance variables. The 3v3 group showed increases in MFT scores (11.86 $\pm$ 0.94 to 12.57 $\pm$ 0.75), passing (14.53 $\pm$ 2.75 to 17.00 $\pm$ 2.08), and shooting (17.84 $\pm$ 1.99 to 20.00 $\pm$ 1.95), accompanied by reductions in 30-m sprint time (5.03 $\pm$ 0.11 to 4.98 $\pm$ 0.10 s) and dribbling time (6.65 $\pm$ 0.46 to 6.42 $\pm$ 0.42 s). Similarly, the 4v4 group improved in MFT (10.90 $\pm$ 1.23 to 11.84 $\pm$ 1.04), passing (14.57 $\pm$ 2.97 to 19.35 $\pm$ 3.56), shooting (17.35 $\pm$ 3.24 to 21.92 $\pm$ 2.78), sprint performance (5.09 $\pm$ 0.11 to 4.89 $\pm$ 0.09 s), and dribbling performance (6.75 $\pm$ 0.46 to 6.08 $\pm$ 0.42 s). Percentage improvements for each variable are presented in Table 2.

Figure 1. Pre-Test vs Post-Test Performance in 3v3 and 4v4 Groups

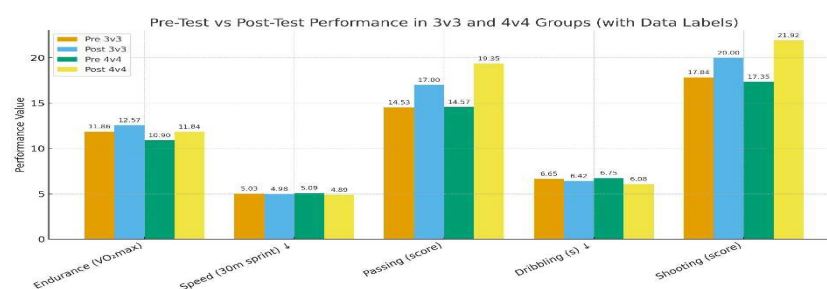
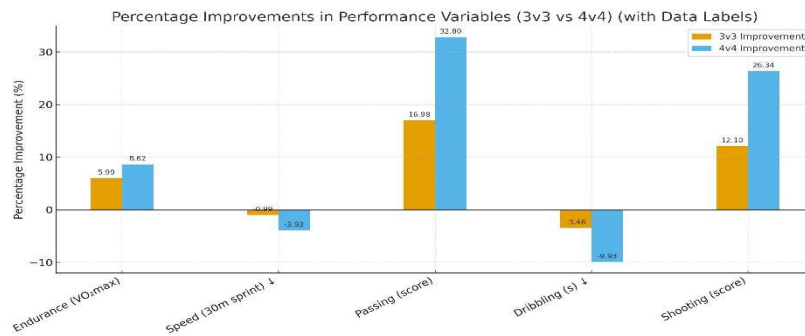


Figure 2. Percentage Improvements in Performance Variables



Prerequisite tests

Assumption tests were performed to confirm that the parametric assumptions were met prior to conducting inferential statistics. Pre- and post-test data were evaluated for normality using the Shapiro-Wilk test, while Levene's test assessed the homogeneity of variances between groups. These steps enabled the independence of further t-test assessments.

Table 3. Prerequisite tests (Normality: Shapiro-Wilk; Homogeneity: Levene)

Variable	Shapiro-Wilk Pre (p)	Conclusion Pre	Shapiro-Wilk Post (p)	Conclusion Post	Levene Pre (p)	Conclusion Pre	Levene Post (p)
Endurance (MFT / VO ₂ max)	0.328	Normal	0.059	Normal	0.331	Homogeneous	0.176
Speed (30 m sprint)	0.416	Normal	0.840	Normal	0.987	Homogeneous	0.729
Passing (score)	0.292	Normal	0.608	Normal	0.918	Homogeneous	0.160
Dribbling (s)	0.445	Normal	0.092	Normal	0.593	Homogeneous	0.551
Shooting (score)	0.616	Normal	0.146	Normal	0.091	Homogeneous	0.105

Table 3 summarizes the assumption tests conducted before inferential analyses. All variables were normally distributed according to the Shapiro-Wilk test ($p > 0.05$), and Levene's test indicated homogeneous variances between groups ($p > 0.05$). Therefore, the assumptions for parametric analyses were satisfied.

Hypothesis tests

Paired t-Test Results

As the data satisfied parametric assumptions, paired samples t-tests were computed to compare scores between pre- and post-test within each training group. The current analysis sought to see if the 3v3 and 4v4 Small-Sided Games formats had individual significant gains in endurance, speed, passing, dribbling and shooting performance.

Table 4. Paired-samples t-tests

Variable	Group	Mean Difference	95% CI	Cohen's d	p
Endurance (MFT)	3v3	-0.72	-1.02 to -0.41	0.86	<0.001
	4v4	-0.94	-1.28 to -0.61	1.02	<0.001
30 m Sprint (s)	3v3	0.06	0.01 to 0.11	0.54	0.048
	4v4	0.20	0.14 to 0.26	1.18	<0.001
Passing (points)	3v3	-2.46	-3.73 to -1.19	0.89	<0.001
	4v4	-4.79	-6.35 to -3.22	1.35	<0.001
Dribbling (s)	3v3	0.23	0.11 to 0.35	0.72	<0.001
	4v4	0.66	0.49 to 0.84	1.26	<0.001
Shooting (points)	3v3	-2.15	-3.16 to -1.15	0.81	<0.001
	4v4	-4.57	-6.02 to -3.12	1.29	<0.001

As shown in Table 4, significant improvements were observed in all outcome variables following both interventions. In the 3v3 group, MFT scores increased significantly (MD = -0.72, 95% CI -1.02 to -0.41, $d = 0.86$, $p < 0.001$), whereas the 4v4 group demonstrated a larger improvement (MD = -0.94, 95% CI -1.28 to -0.61, $d = 1.02$, $p < 0.001$). Sprint performance also improved significantly in both groups, with small-to-large effect sizes (3v3: $d = 0.54$, $p = 0.048$; 4v4: $d = 1.18$, $p < 0.001$). Significant

improvements were likewise observed for passing, dribbling, and shooting performance (all $p < 0.001$), with effect sizes ranging from moderate to large ($d = 0.72$ – 1.35).

In summary, these findings show that both SSG formats was successful in generating substantial within-group performance improvements but the extent of improvement varied by group and performance domain.

Independent T-Test Results

Besides group comparisons, independent-samples t-tests were performed to assess whether there was a significant difference between training formats after the intervention. In this analysis, data on the relative efficacy of 3v3 and 4v4 formats for improving physical and technical performance in a soccer context showed both formats to achieve superior results over no format; however, only select measures revealed advantages based on enumeration (which format achieved better outcomes).

Table 5. Independent T-Test Results

Variable	Mean Difference	95% CI	Cohen's d	p
Endurance	0.73	0.01–1.46	0.74	0.049
Speed	0.08	0.01–0.16	0.68	0.042
Passing	-2.36	-4.69 to -0.03	0.79	0.048
Dribbling	0.34	0.01–0.67	0.72	0.049
Shooting	-1.93	-3.81 to -0.05	0.75	0.049

Table 5 presents the post-intervention comparisons between groups. Significant differences favored the 4v4 intervention across all measured variables. Between-group differences were observed for MFT scores (MD = 0.73, 95% CI 0.01–1.46, $d = 0.74$, $p = 0.049$), sprint performance (MD = 0.08 s, 95% CI 0.01–0.16, $d = 0.68$, $p = 0.042$), passing (MD = -2.36, 95% CI -4.69 to -0.03, $d = 0.79$, $p = 0.048$), dribbling (MD = 0.34 s, 95% CI 0.01–0.67, $d = 0.72$, $p = 0.049$), and shooting (MD = -1.93, 95% CI -3.81 to -0.05, $d = 0.75$, $p = 0.049$).

Discussion

The results demonstrated that both 3v3 and 4v4 Small-Sided Games (SSG) were associated with improvements in the physical fitness and technical performance of university football players. These findings are consistent with previous studies reporting that SSG provides an effective training approach by simultaneously integrating physiological and technical demands within game-based situations (Carlsson et al., 2025; Guneralp et al., 2025; Ridwan et al., 2025). However, because the present study employed a quasi-experimental design without randomization or a true control group, the observed improvements should be interpreted as associations rather than definitive causal effects.

Compared with the 3v3 format, the 4v4 group demonstrated greater improvements in endurance, speed, and dribbling performance. These findings are generally consistent with previous studies suggesting that different SSG formats may induce distinct physiological and technical adaptations depending on player involvement, available playing space, and task constraints (Abu-Shihab, 2021; Jumareng, 2024; Neag et al., 2024). One possible explanation is that the specific spatial characteristics and player interactions within each format may have influenced movement patterns, repeated high-intensity actions, and technical involvement. Nevertheless, these physiological mechanisms were not directly measured in the present study and therefore should be regarded as interpretative rather than conclusive explanations.

The 4v4 format was also associated with greater improvements in shooting performance, whereas improvements in passing were observed in both groups. These findings are in agreement with previous studies indicating that game formats involving a larger number of players may provide more structured tactical interactions, positional rotations, and offensive opportunities that facilitate technical execution (Suryadi et al., 2023; Zaharia et al., 2023). Similarly, Clemente et al. (2025) reported that different SSG formats can effectively improve passing performance through repeated technical actions under representative game conditions. However, differences in participant characteristics, training duration, and intervention protocols across studies should be considered when comparing the magnitude of these improvements.

The present findings extend the existing literature by demonstrating that SSG interventions may also be beneficial for non-professional university football players, a population that has received considerably less attention than elite or academy athletes. Previous studies have predominantly involved highly trained players participating in structured competitive environments (Carlsson et al., 2025; Guneralp et al., 2025; Ridwan et al., 2025). In contrast, university athletes generally experience greater variability in training exposure and competitive experience. Therefore, the current findings provide additional evidence that SSG-based training may represent a practical and time-efficient approach for integrating physical and technical development within university football programs.

Several limitations should be acknowledged when interpreting the present findings. First, the quasi-experimental design with nonequivalent comparison groups limits the ability to establish causal relationships. Second, participants were selected using purposive sampling and allocated through ordinal pairing rather than randomization, which may have introduced selection bias. Third, the relatively small sample size and recruitment from a single university limit the generalizability of the findings. Fourth, differences in pitch dimensions, bout duration, recovery intervals, and goalkeeper use between the two SSG formats may have acted as confounding variables. Finally, no long-term follow-up assessment was conducted; therefore, it remains unclear whether the observed improvements would be maintained over time. Future studies should employ randomized controlled designs, larger multicenter samples, and longitudinal follow-up to strengthen the current evidence.

From a practical perspective, the present findings suggest that coaches and physical education practitioners may consider selecting different SSG formats according to specific training objectives. The 3v3 format may be appropriate when greater emphasis is placed on high-intensity individual actions, whereas the 4v4 format may provide additional opportunities for collective play and technical execution. Nevertheless, these recommendations should be interpreted within the methodological limitations of the present study.

Overall, the findings suggest that both 3v3 and 4v4 Small-Sided Games are associated with improvements in physical fitness and technical performance among university football players. These results support previous evidence regarding the value of SSG as an integrated football training method (Carlsson et al., 2025; Guneralp et al., 2025; Ridwan et al., 2025), while extending its application to non-professional university athletes. However, further studies employing more rigorous experimental designs are required before definitive conclusions regarding the superiority of one SSG format over another can be established.

Conclusions

Conclusions: Small sided games (SSG) used in this study are a feasible training strategy you can implement into your players with state level uni football players to improve physical fitness and technical skills. The results showed that the 3v3 format is more effective for endurance, speed and dribbling improvement when compared to the 4v4 format which partially improved shooting performance. Both groups both whether they are recording passing within games or not at all improved dramatically. The results indicate that SSG can be an efficient and practical training model for nonprofessional athletes due to the time constraints as well as resource limitations present in universities/French schools. SSG should be incorporated into coaches and educators training programs based on how performance measures define SSG formats. In general, this research provides some strong evidence that the training of physical and technical elements together via SSG are a modern contextualised strategy for youth football development which adds value to both applied practice and the emerging literature on game based training methods including their manipulation.

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