The Effect of Training Based on Reduced Position Games on The Development of Technical and Physical Skills in Young Footballers

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Abstract

The effect of training based on positional reduced games on the physical and technical performance of young soccer players in training has attracted increasing attention from researchers. The aim of this study is to examine the impact of training based on positional reduced games on the evolution of technical (juggling, ball control, shooting) and physical (speed) qualities of young players over the course of a season, with a frequency of 3 to 4 training sessions per week. The study population consisted of 598 players, including 218 elite players (36.5%) and 380 leisure players (63.5%), aged 6 to 17 years (M = 11.22; SD = 3.11). Players completed a battery of tests at the beginning and end of the season. These tests included juggling, ball handling, shooting, as well as speed over 10 and 20 meters. Data were analyzed using Student's t-test for paired samples. Interventions based on reduced games induced significant improvements in juggling ($p < 0.05$), ball handling ($p < 0.05$), shooting ($p < 0.05$) and 10-meter speed ($p < 0.05$). However, for 20-meter speed ($p = 0.725 > 0.05$). The results were not significant. The results of this study underline the effectiveness of reduced-game training in improving the technical and physical performance of young soccer players in training. The results confirm that one year of training based on reduced play induced greater improvements in physical and technical performance and a non-significant stabilisation of sprinting over a distance of 20 metres in the football players from the different structures.

Keywords : Reduced-position play, training, soccer, technical, physical, young players.

Introduction

Soccer, like many other sports, has undergone profound changes. The technical, tactical and physical demands of top-level soccer are increasingly stringent if the player is to succeed in today's modern game. According to KARAM, E. Mehdi, & GOURCH, A. (2024), the player must combine a number of factors to reach the professional level. The content of training programs and methods, often unsuited to the learning and training of young footballers, hinders the development of players in the various factors that optimize top-level performance. These

same programs also have a negative impact on the young talents likely to join local, national and international professional teams. This mandatory development phase is based on the performance factors specific to modern soccer, namely technical, tactical, physical and mental qualities (Palucci Vieira LH, Aquino R, Moura FA, Barros RML, Arpini VM, Oliveira LP, et al., 2019). These parameters are assimilated over the course of the different age categories, from 6 to 17, and enable individual and collective development of each player involved in the training project.

However, many years of experience in soccer schools and academies, as a coach and technical director, have led me to conclude that there is a lack of technical and physical skills among young Moroccan footballers in real match situations. These youngsters are the future players for clubs and national teams. The main question guiding our work is that of the effectiveness of training methods in the player training process (Sarmento et al., 2018). Small-scale games have become an important training medium in team preparation (Olthof et al., 2018). Consequently, reduced position games (PRGs) aim to strengthen the specific skills of players within a team, using small groups. These games are characterized by a reduced number of players and a smaller playing surface, as well as positioning (defense, midfield, attack) that favors interactions between players in restricted spaces. The aim is to imitate the movements and displacements observed in real-life game scenarios (Clemente et al., 2023) .

These reduced games (SSG) have become a widely used training tool in soccer (Clémente et al., 2020b). SSGs are reduced situations that integrate the technical aspect into player development, as well as tactical and physical aspects. The central question guiding this study is to ascertain the extent to which training methods based on reduced-position games influence the development of technical (juggling, ball control and shooting) and physical (speed) qualities in young footballers during training. Our aim is to propose a training methodology based on reduced play (Clémente FM, Ramirez-Campillo R, Afonso J and

Sarmento H, 2021), likely to be effective in developing and improving technical-tactical and physical factors in Moroccan footballers in training. To illustrate our study, we formulate the following hypothesis: training using reduced-position games positively and significantly improves the technical and physical qualities essential to the performance of young footballers in training.

Materials and methods

Study participants.

The present study involved 598 young footballers with a mean age of 11.22 years (± 3.11 years), from four different structures, who had undergone a minimum of two years of training at the centre. Field tests were conducted at the commencement and conclusion of the training programme in order to evaluate the progress achieved in terms of technical and physical qualities during the study period. The participants were divided into two groups: recreational players (63.5%) and elite players (36.5%). (Table 1)

Table 1 : Sample characteristics

Structure	Age	Players					
	Averages ±sd	Professional		Leisure		Total	
		N	%	N	%	N	%
Chippo Kenitra	10.9±22.58	51	8.5%	83	13.9%	134	22.4%
PSG Rabat	11.81±3.19	89	14.9%	179	29.9%	268	44.8%
Cubs Rabat	11.59±.50	22	3.7%	0	0.0%	22	3.7%
Prestigia Casa	10.50±3.38	56	9.4%	118	19.7%	174	29.1%
Total	11.22±3.11	218	36.5%	380	63.5%	598	100.0%

P : probability of significance at the 5% level.

Protocol

The study took place over a full season, with one week dedicated to technical and physical assessments at the start and end of the program. Participants underwent technical tests (juggling, ball control, shooting) and physical tests (10 m and 20 m sprints) before and after the intervention. During the study, the players took part in three weekly training sessions, as well as one match per week, in accordance with a program structured around football-specific short games. The program, devised by the technical director, comprised five distinct phases: warm-up, coordination exercises, technical exercises, tactical exercises and match. The three main components of the program - technical work, tactical work and free play - were organized in the form of reduced games, adapted to the coach's objectives and the specificities of each category.

Data analysis

Data were analysed using Student's t-test for paired samples. All data analyses were performed with SPSS 24 (IBM Corp., Armonk, NY, USA). A significance level of 5% was adopted for cases.

Results

According to Table 2, the results presented indicate an improvement in performance between pre-test and post-test for the different variables studied. However, no significant difference was observed for the 20 m speed test. In addition, an improvement in performance was observed for all variables, irrespective of whether the training sessions lasted 75 minutes or 90 minutes.

The results of statistical tests, including repeated measures ANOVA and Bonferroni post hoc tests, supported by percentages of change, confirm the effectiveness of the training methods used to optimize technical and athletic performance. However, the differences

observed between groups for certain variables, such as speed and CMJ jumping ability, suggest that specific, targeted training approaches may be required to maximize gains in different areas of performance. These findings highlight the importance of tailored training strategies to improve both technical skills and physical abilities in the context of soccer.

Table 2 Descriptive statistics: Data for pretest and posttest variables presented as means and standard deviations (S.D.)

	Period	Players				Session duration						P
		Professional		Leisure		75 min		90 minutes		Total		
Variables		Average	Sd	Averag e	Sd	Average	Sd	Average	Sd	Average	Sd	
PD	Pre-test	26.66	15.45	11.82	11.94	11.91	12.01	26.24	15.57	17.23	15.11	.000
	Post-test	31.78	15.00	16.05	13.38	16.10	13.44	31.40	15.12	21.78	15.90	
PG	Pre-test	14.85	13.49	10.01	11.82	9.99	11.87	14.80	13.38	11.78	12.66	.000
Jungling	Post-test	18.50	14.07	13.04	13.40	12.99	13,41	18.50	14.03	15.03	13.89	
T	Pre-test	6.90	6.00	3.78	3.98	3.80	4.00	6.82	5.98	4.92	5.04	.000
	Post-test	8.74	6.29	5.35	4.64	5.31	4.65	8.74	6.23	6.58	5.54	
RF balloon	Pre-test	14.28	4.96	18.41	6.58	18.41	6.62	14.36	4.94	16.91	6.35	.000
handling	Post-test	13.62	4.51	17.34	6.22	17.34	6.26	13.69	4.49	15.99	5.93	
Ball handling	Pre-test	15.51	5.25	19.48	6.86	19.50	6.89	15.54	5.21	18.03	6.60	.000
LF	Post-test	14.67	4.63	18.34	6.35	18.35	6.38	14.71	4.60	17.00	6.04	
	Pre-test	10.15	4.35	8.66	4.71	8.65	4.69	10.14	4.41	9.20	4.64	.000
	Post-test	12.53	4.13	11.63	4.14	11.60	4.13	12.57	4.15	11.96	4.16	
Speed10m	Pre-test	2.41	.41	2.87	.76	2.87	.76	2.42	.41	2.70	.69	.000
	Post-test	2.27	.41	2.72	.73	2.72	.73	2.27	.41	2.56	.67	

Speed 20m	Pre-test	4.36	.63	4.79	.97	4.79	.98	4.37	.63	4.63	.89	.725
	Post-test	4.27	.63	4.80	2.23	4.80	2.24	4.28	.62	4.61	1.83	

PD : right foot, PG : left foot, T: shots, P : probability of significance at the 5% level

Evaluation of the effect of training on the physical and technical performance of young footballers: Data were analyzed using Student's t-test for paired samples. Interventions on reduced games induced a significant improvement in juggling ($p < 0.05$), ball handling ($p < 0.05$), shooting ($p < 0.05$) and 10-meter speed ($p < 0.05$). However, for 20-meter speed ($p > 0.05$), the results showed no statistical significance.

Table 3. Comparison of pre-test and post-test means by Student's t-test for paired samples

Variables		Matched differences					T	Ddl	P
		Differences between Pre- and post-test	Sd	Average sd Error	Confidence interval of the difference at 95%.				
					Lower	Superior			
Pair 1	Jungling RF - jungling RF Post-test	-4.54791	5.53059	.22616	-4.99208	-4.10374	-20.109	597	.000
Pair 2	LF de jungling - LF de Jungling Post-test	-3.25799	5.63286	.23034	-3.71038	-2.80561	-14.144	597	.000
Pair 3	Head - Head Post-test	-1.66498	2.65207	.10845	-1.87798	-1.45199	-15.352	597	.000
Pair 4	RF balloon handling - RF balloon handling Post-Test	.92685	1.29758	.05315	.82246	1.03123	17.438	595	.000
Pair 5	LF ball handling - LF ball handling Post-Test	1.02839	1.81424	.07431	.88244	1.17434	13.838	595	.000
Pair 6	Shoot - shoot_ Posttest	-2.75460	4.26433	.17438	-3.09707	-2.41212	-15.796	597	.000

Pair 7	Speed10m - speed10m_Post.test	.144	.095	.004	136	.151	36.977	596	.000
Pair 8	Speed20m - speed20m_Post.test	.023	1.632	.067	-.108	.155	.352	597	.725

LF : Left foot, RF : Right foot, P : probability of significance at the 5% level.

According to Table 4, the results show a significant effect of training on the physical and technical qualities of young footballers ($F = 395.177$, $p < 0.05$). However, no significant improvement in performance was observed according to player profile ($F = 0.175$, $p = 0.676$, $p > 0.05$) or duration of training sessions ($F = 0.803$, $p = 0.370$, $p > 0.05$).

Table 4: Evaluation of the interaction between training, player profile and session duration.

	F	Ddl the hypothesis	Error ddl	Meaning	Partial eta-square
Training effect	395.177[b]	1.000	595.000	.000	.399
Effect of player profile					
Training effect x Player profile	.175[b]	1.000	595.000	.676	.000
Training effect x Session duration	.803[b]	1.000	595.000	.370	.001

Discussion

The aim of this study was to examine the impact of reduced-position games on the physical and technical abilities of young footballers in training. The results revealed significant differences in technical and physical performance between the beginning and end of the season, depending on the different game formats used (Sangnier, Cotte, Brachet, Coquart, & Tourny, 2019). The playing conditions favored greater concentration, resulting in more active player participation. As a result, the ball carrier was subjected to more intense and constant pressure

(Silva, Conte, & Clemente, 2020). In addition, it was observed that players performed a higher number of technical actions when in contact with the ball or close to the ball carrier. This study compared the evolution of technical and physical performance in different categories of players (Gréhaigne, 2018). The results showed significant differences in all technical variables as well as in 10-meter speed (Errama, Bassiri, Atifi, & Lotfi, 2024). However, no significant differences were observed for 20-meter speed. Small-scale games (or "small-sided games", SSGs) have become increasingly popular in recent years, as they enable real-life game situations to be recreated (Olthof, Frencken, & Lemmink, 2018). They are used to develop aerobic endurance as well as technical and tactical skills (Bujalance-Moreno et al., 2018). However, these training formats are not as conducive to the development of sprint speed over distances greater than 20 meters, due to several factors.

Firstly, SSGs often limit maximum sprinting distances and the frequency of high-intensity action due to the reduced size of the field. This format imposes high-intensity efforts on players, but usually in the form of rapid changes of direction and short runs, which place greater demands on aerobic endurance and deceleration and acceleration capacities, rather than long, continuous sprints. Indeed, studies have shown that the distances covered at high speed and sprinting are lower in SSGs than in large-scale or competitive games, which limits their effectiveness in improving players' maximum sprinting speed (Beato, Vicens-Bordas, Peña, & Costin, 2023). In terms of technical performance, several studies highlight the benefits of RJ for young players. According to Sarmento et al (2018), young players involved in RJ experienced notable improvements in their technical performance, as well as in their ability to understand tactical aspects of the game (Grün, 2016). Players need to develop technical skills such as ball control, passing accuracy and their ability to maintain possession of the ball in a tight space despite pressure. This is crucial to their personal and collective technical training,

as it helps them improve their individual performance while harmonizing their actions with those of the team (Sgrò, Bracco, Pignato, & Lipoma, 2018)

In addition, small-sided games (SSG) are primarily designed to develop technical and tactical aspects while maintaining a high intensity of effort, thus helping to improve overall fitness. This type of training is particularly beneficial for aerobic endurance and the repetition of short-duration explosive actions (Akdoğan et al., 2021). However, the development of pure speed requires specific training, including longer sprint distances, which are not frequently encountered in SSG. For example, a study by Bahtra et al (2023) points out that SSGs in 5v5 format mainly increased aerobic endurance in young players, but did not produce significant results with regard to sprint speed. To improve speed over distances such as 20 meters, it would be more relevant to integrate specific straight-line sprint exercises, which are more difficult to achieve in restricted game formats. Thus, it has been shown that reduced position games, especially for young elite players, are more structured and offer more opportunities for technical expression than for recreational players (Clémente and Sarmento, 2020). The study also revealed significant, albeit modest, differences in the values of technical variables between different categories of players. Previous research (Ferreira et al., 2019) has suggested that, in reduced position games with smaller formats, there are fewer options for passing the ball, forcing players to perform more ball-driving actions to create space on the field. Other recent research shows that JR training can increase the number of shots attempted and taken in matches thanks to the numerous opportunities to practice this technical skill (Martinez-Santos et al., 2021).

In addition researchers have found that PGR promotes improved shot accuracy and power, as well as an increase in the number of shots attempted and taken in matches due to frequent opportunities to practice this technical skill (Hammami, Gabbett, Slimani, & Bouhlel,

2018). The results of this study suggest that coaches can use the manipulation of reduced game formats and player numbers as pedagogical strategies, depending on the specific objectives of the training session. The variety of PRJ formats means that sessions can be tailored to the specific needs of players. According to Beato et al (2023), small-format games increase contact with the ball and allow for more real-time decision-making, stimulating players' technical actions and reactivity in restricted spaces. These games also encourage the development of passing and ball control skills, thanks to intensive situations that focus on individual skills in a competitive environment. In contrast, medium formats, analyzed by Clémente et al. (2020), explain that medium-format games (e.g., 5v5 or 6v6) enable complex tactical situations to be worked on by adding players, stimulating decision-making and offensive and defensive dynamics. These formats encourage the learning of group strategies and anticipation skills, as several players are involved in each action. Finally, for large-format games, such as 9v9 or the complete game, Beato et al. (2023) indicate that these formats reproduce match-like situations, emphasizing defensive interactions and requiring collective organization. Large-format games may reduce the number of individual contacts with the ball, but reinforce skills in defensive positioning and team communication, essential elements in competitive play.

Conclusions

This study provides empirical evidence supporting the effectiveness of training based on positional reduced games for the development of technical and physical skills in young footballers. The results suggest that integrating reduced games into training programs can be a beneficial approach to optimizing the overall development of young athletes. It is recommended that coaches and practitioners adopt these game formats to enrich their training sessions. However, future research should examine the long-term effects of reduced-position games, particularly on tactical understanding, decision-making abilities, and the specific

impacts of this type of training on players belonging to different age groups and skill levels. From this perspective, future research must verify the impact on the technical and physical skills of imputed footballers, as young people with disabilities encounter specific obstacles that can prevent them from participating in collective sports such as soccer (Ben Rakaa et al., 2024b), despite the positive psychological and social effects (Ben Rakaa et al., 2025). This finding is influenced significantly by the training and perceptions of their supervisors regarding the motor skills of these pupils (Ben Rakaa et al., 2024a et 2024c).

Conflict of interest

If the authors have any conflicts of interest to declare.

References

Akdoğan, E., Yılmaz, İ., Köklü, Y., Alemdaroğlu, U., & Cerrah, A. O. (2021). The effect of isolated or combined small-sided games and speed endurance training on physical performance parameters in young soccer players. Kinesiology, 53(1), 78–85. https://doi.org/10.26582/k.53.1.8

Bahtra, R., Tohidin, D., Andria, Y., Dinata, W. W., & Susanto, N. (2023). Small-sided games 5v5 : Improving aerobic endurance of youth soccer players. Physical Education Theory and Methodology, 23(5), 739-746. https://doi.org/10.17309/tmfv.2023.5.12

Beato, M., Vicens-Bordas, J., Peña, J., & Costin, A. J. (2023). Training load comparison between small, medium, and large-sided games in professional soccer. Frontiers in Sports and Active Living, 5, Article 1165242. https://doi.org/10.3389/fspor.2023.1165242

Bujalance-Moreno, P., Latorre-Román, P. Á., & García-Pinillos, F. (2018). A systematic review on small-sided games in football players: Acute and chronic adaptations. Journal of Sports Sciences, 37(8), 921–949. https://doi.org/10.1080/02640414.2018.1535821

Clemente, F. M., & Sarmento, H. (2020). The effects of small-sided soccer games on technical actions and skills: A systematic review. Human Movement, 21(3), 100-119. https://doi.org/10.5114/hm.2020.93014

Clemente, F. M., Afonso, J., Castillo, D., Los Arcos, A., Silva, A. F., & Sarmento, H. (2020). The effects of small-sided soccer games on tactical behavior and collective dynamics: A systematic review. Chaos, Solitons & Fractals, 134, Article 109710. https://doi.org/10.1016/j.chaos.2020.109710

Clemente, F. M., Ramirez-Campillo, R., Afonso, J., & Sarmento, H. (2021). Effects of small-sided games vs. Running-based high-intensity interval training on physical performance in soccer players: A meta-analytical comparison. Frontiers in Physiology, 12, Article 642703. https://doi.org/10.3389/fphys.2021.642703

Clemente, F. M., Praça, G. M., Aquino, R., Castillo, D., Raya-González, J., Rico-González, M., Afonso, J., Sarmento, H., Silva, A. F., Silva, R., & Ramirez-Campillo, R. (2023). Effects of pitch size on soccer players' physiological, physical, technical, and tactical responses during small-sided games : A meta-analytical comparison. Biology of Sport, 40(1), 111–147. https://doi.org/10.5114/biolsport.2023.110748

Ben Rakaa, O., Bassiri, M., & Lotfi, S. (2024a). Defining the Effect of Teachers' Medical History on their Inclusive Teaching Practice: Analyzing Feelings of Competence and Knowledge in Inclusive Physical Education. *Physical Education Theory and Methodology*, *24*(5), 777–783. https://doi.org/10.17309/tmfv.2024.5.13

Ben Rakaa, O., Bassiri, M., & Lotfi, S. (2024b). *Pour une Inclusion Physique Radicale : L'Urgence d'une Education Physique et Sportive Adaptee !* https://hal.science/hal-04596000

Ben Rakaa, O., Bassiri, M., & Lotfi, S. (2024c). The Influence of School Pathologies on the Feeling of Pedagogical Incompetence in Teaching Inclusive Physical Education. *Physical Education Theory and Methodology*, *24*(4), 626–634. https://doi.org/10.17309/tmfv.2024.4.15

Ben Rakaa, O., Bassiri, M., & Lotfi, S. (2025). Promoting Inclusion and Well-Being Through Inclusive Physical Education and Parasports: an Approach for Adolescents with Motor Impairment. *Physical Education Theory and Methodology*, *25*(1), 130–138. https://doi.org/10.17309/tmfv.2025.1.16

Errama, M., Bassiri, M., Atifi, J., & Lotfi, S. (2024). A Comparative Analysis of the Effects of Reduced Positional Games and Traditional Training on the Physical and Technical Performance of Young Soccer Players in Training. Physical Education Theory and Methodology, 24(6), 961-970. https://doi.org/10.17309/tmfv.2024.6.14

Ferreira, E. C., Belozo, F. L., Grandim, G., Lizana, C., Machado, J. C., Misuta, M., ... & Scaglia, A. J. (2019). The influence of different game formats on the technical and tactical aspects of soccer players. Revista Brasileira de Educação Física e Esporte, 33(4), 551-560. https://doi.org/10.11606/1807-5509201900040551

Gréhaigne, J.-F. (2018). Small-sided games : Fun and learning. eJRIEPS, Special Issue No. 2. https://doi.org/10.4000/ejrieps.514

Hammami, A., Gabbett, T. J., Slimani, M., & Bouhlel, E. (2018). Does small-sided games training improve physical fitness and team-sport-specific skills? A systematic review

and meta-analysis. Journal of Sports Medicine and Physical Fitness, 58(10), 1345-1356. https://doi.org/10.23736/S0022-4707.17.07420-5

Karam, E. M., & Gourch, A. (2024). Analysis of performance determinants in professional soccer players in Morocco : Using survey data. International Journal of Accounting, Finance, Auditing, Management and Economics, 5(9), 510-530. https://doi.org/10.5281/zenodo.13826376

Martínez-Santos, R., et al. (2021). Effects of small-sided games on the physical fitness of youth soccer players: A systematic review.

Milanovic, Z., Sporis, G., & Weston, M. (2015). Effectiveness of high-intensity interval training (HIT) and continuous endurance training for VO2max improvements: A systematic review and meta-analysis of controlled trials. Sports Medicine, 45(10), 1469-1481. https://doi.org/10.1007/s40279-015-0365-0

Morgans, R., Di Michele, R., & Drust, B. (2018). Soccer match play as an important component of the power-training stimulus in Premier League players. International Journal of Sports Physiology and Performance, 13(5), 665-667. https://doi.org/10.1123/ijspp.2016-0412

Olthof, S. B. H., Frencken, W. G. P., & Lemmink, K. A. P. M. (2018). Relative pitch area derived from match influences physical and tactical performance of elite soccer players in small-sided games. Journal of Sports Sciences, 36(14), 1557-1563. https://doi.org/10.1080/02640414.2017.1403412

Olthof, S. B. H., Frencken, W. G. P., & Lemmink, K. A. P. M. (2018). Match-derived relative pitch area changes the physical and team tactical performance of elite soccer players

in small-sided soccer games. Journal of Sports Sciences, 36(14), 1557-1563. https://doi.org/10.1080/02640414.2017.1403412

Palucci Vieira, L. H., Aquino, R., Moura, F. A., Barros, R. M. L., Arpini, V. M., Oliveira, L. P., & Figueiredo, P. (2019). Team dynamics, running, and skill-related performances of Brazilian U11 soccer players compared to professional players in official matches. Journal of Strength and Conditioning Research, 33(8), 2202-2216. https://doi.ogr :10.1519/JSC.0000000000002577

Sangnier, S., Cotte, T., Brachet, O., Coquart, J., & Tourny, C. (2019). Planning training workload in soccer using small-sided game density. Journal of Strength and Conditioning Research, 33(10), 2801-2811. https://doi.org/10.1519/JSC.000000000002598

Sarmento, H., Clemente, F. M., Harper, L. D., Costa, I. T., Owen, A., & Figueiredo, A. J. (2018). Small-sided games in soccer: A systematic review. International Journal of Performance Analysis in Sport, 18(5), 693-749. https://doi.org/10.1080/24748668.2018.1517288

Sgrò, F., Bracco, S., Pignato, S., & Lipoma, M. (2018). Small-sided games and technical skills in soccer training : Systematic review and implications for sport and physical education practitioners. Journal of Sports Science, 6(1), 9-19. https://doi.org/10.17265/2332-7839/2018.01.002

Silva, A. F., Conte, D., & Clemente, F. M. (2020). Decision-making in youth team-sports players: A systematic review. International Journal of Environmental Research and Public Health, 17(11), 3803. https://doi.org/10.3390/ijerph17113803

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