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Original Scientific Article

The Influence of Small-Sided Games and Floaters Intervention on Physical Components of Soccer Players

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Abstract

Background. In soccer, numerical superiority enhances the effectiveness of both offensive and defensive actions performed by players. To improve the performance of the players, small-sided games (SSGs) with numerical inferiority and superiority should be incorporated into training sessions. Objectives. The study aimed to evaluate the effect of a 12-week training program using floaters and small-sided games (SSGs) on the physical performance of soccer players.

Materials and methods. A total of 52 soccer players participated in the study. The age ranged from 14 to 16 years. The participants were divided into small-sided games with the floater's group (Group I, SSGs+Floaters, n = 26) and the control group (Group II, n = 26). A 12-week program of small-sided games with floaters intervention was completed by the experimental group, who trained five days per week. Each session lasted 90 minutes, including warming up, small-sided games incorporating floaters intervention, lead-up games, and cooling down. The control group did not practice the floaters training program. The Yo-Yo intermittent recovery level 1 test was used to assess maximal aerobic endurance (VO_2max), the Sargent jump test measured leg explosive strength, the Illinois agility test assessed soccer-specific agility, and the 50-meter sprint test evaluated speed. A paired t-test was conducted to measure the within-group differences from pre- to post-test, while the effects of the training were evaluated using ANCOVA and effect size analysis.

Results. The results indicated that small-sided games with floaters intervention significantly improved maximal aerobic endurance, leg explosive strength, and agility except speed. In contrast, the control group did not demonstrate similar improvements. Furthermore, there was a significant difference between the experimental and control groups in maximal aerobic endurance, leg explosive strength, and agility, although speed did not show such a difference.

Conclusions. The findings of this study suggest that implementing small-sided games with floaters intervention can effectively enhance physical performance variables in junior soccer players.

Keywords: small-sided games, floaters training, VO_2max, agility, leg explosive strength, speed.

Introduction

Soccer is a highly complex sport that demands proficiency in all areas of performance. To attain success in soccer, the players must excel in technical, physical, tactical, and mental skills (Kusuma et al., 2024). It is an intermittent sport, and one of the crucial factors for success is physical fitness; the players need to develop and enhance both their aerobic and anaerobic endurance (Michaildis et al., 2024). It is well-known in high-performance sports that exercises are most effective when closely resembling competition demands (Mallo & Navarro, 2008). Thus, physical variables can be improved in a manner that is more specific to soccer than simply engaging in running alone (Hoff et al., 2002). To incorporate the actual game conditions into training, coaches aim to replicate the physical, technical, and tactical requirements by adapting tasks to the specificity of the game, simplifying their forms, and aligning training objectives accordingly (Kvas-Cabral et al., 2022; Vella et al., 2022).

The implementation of drill-based activities, such as small-sided games (SSGs), has become popular and prevalent in the last decade in soccer training for all ages and levels. SSGs help to improve physical fitness and technical and tactical skills (Halouani et al., 2014). The SSGs, played on smaller pitches with fewer players, have become prevalent for optimizing training time and improving soccer-specific fitness and match-winning skills (Clemente et al., 2014),

which is a challenging, adaptable, fun, and social exercise where participants of all ages can combine high-intensity aerobic endurance, and strength training (Krustrup et al., 2016). The SSGs can emphasize player interactions due to the smaller number of players and smaller playing areas and impose intense physical demands (Clemente et al., 2014). SSGs involve modifications in pitch size (Clemente & Sarmento, 2020), using modified rules (Castellano et al., 2013) involving fewer players (Selmi et al., 2020), which are crucial for developing technical, tactical, and physiological outcomes (Hill-Haas et al., 2011; Rampinini et al., 2007). The SSGs are classified as small-sided (< 4 vs. 4), medium-sided (MSGs) (5 vs. 5 to 8 vs. 8), and large-sided (LSGs) (9 vs. 9) games (Owen et al., 2012).

The SSGs help to provide the ability to replicate the complicated characteristics of a competitive match by providing random situations and situational interference (Sarmento et al., 2018). Participating in SSGs enhances learning and contributes to the development of soccer players. SSGs enable coaches to create and control particular task constraints, such as numerical relationships, that influence players in exploring and finding solutions to their ability to adapt their behaviors to circumstances that are constantly changing (Davids et al., 2013). Manipulating task constraints in SSGs appears to be an effective method for skill acquisition (Francesco Sgrò et al., 2018). A commonly manipulated numerical relations constraint in SSGs is using floaters (Castellano et al., 2016). Changing the number of players introduces temporary "overload" and "under load" circumstances between the opposite teams through a "floater" player. The effect of incorporating floaters in SSGs is one of the most trending and frequently investigated task constraints (Moreira Praça et al., 2017).

The "floater" is a player who always plays with the team in possession during SSGs, providing numerical superiority (Lacome et al., 2018). The coaches aim to create an imbalance by including floater players, which makes the SSGs drill more reflective of real game scenarios because soccer often involves numerical imbalances, whether temporarily or permanently. This unbalanced training pattern facilitates ball retention and generates temporary 'overload' and 'underload' situations, improving defensive and attacking skills and increasing the physical load on the floater (Hill-Haas et al., 2010, 2011). This neutral (floater) player switches to the team in possession of the ball, creating these temporary situations. However, (Nagy et al. 2020) explained that as the number of "neutral" players (floaters) increased, the intensity of the small-sided games gradually decreased.

The floaters are typically used in two different manners: as in-floaters, they are positioned inside the pitch as regular players, switching teams every time ball possession changes while always remaining in the attack (Lacome et al., 2018). (Moniz et al., 2020) suggest that using inside floaters influences physical, technical, and collective tactical behavior. The second one is out-floaters, who stay on the sidelines and serve as an option for players in possession to perform wall passes (Castellano et al., 2016). (Lacome et al., 2018) reported that coaches often use floater players to manage the load of certain players. Their multifunctional nature and the use of floaters boost intensity, making them ideal for replicating the movement demands, physiological intensity, and technical requirements of competitive play.

Although previous studies have provided extensive information on the use of floaters during SSGs, there is a gap in the investigation regarding possible changes in training using floaters and SSGs on the physical performance of soccer players. Physical variables have been identified as one of the primary factors influencing performance in sports. Thus, this study aimed to assess the effect of 12 weeks of SSGs with floaters training on the physical performance of soccer players, specifically focusing on maximal aerobic endurance, leg explosive strength, agility, and speed.

Materials and Methods

Participants

The protocol for the investigation is summarised in Figure 1. To conduct this study, 52 football players selected from two academies (S.M.R.C. Kollemcode and S.B.F.A. Poovar) in Trivandrum, Kerala, India, were chosen. The age ranges from 14 to 16 years, and the players have a minimum of three years of experience in soccer. The participants were divided into two groups, each with 26 players. The characteristics of participants are presented in Table 1. The Group I (n = 26) experimental group underwent SSGs with floaters training. Group II (n = 26) served as the control group. Before participating, each participant issued written informed consent. The university's institutional ethical committee granted approval for the study (No.:HEC/PU/2023/03-07-2023).

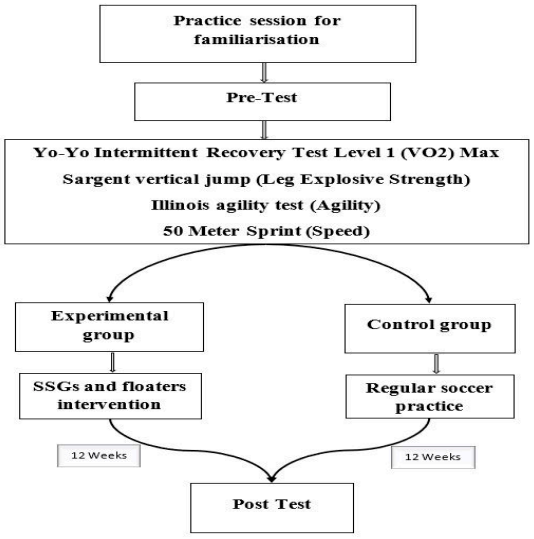

Fig. 1. Schematic diagram of the experimental protocol and variable measurements followed in experimental and control groups

Design

The SSGs with floaters training group underwent weekly training for five days (Monday, Tuesday, Wednesday, Friday, and Saturday). The practice session was only held in the morning session. Each session lasts 90 minutes and includes warm-up, SSGs with floaters training, match practice, and cooling-down exercises. The control group engaged in their

weekly schedule; they were on regular practice sessions. The training program lasted a total of 12 weeks. The pre-test measurements were taken one week prior to the beginning of the study. In order to facilitate the participant's familiarisation with the assessments, each test was administered twice prior to their conducting. All tests were performed on a soccer field. The assessments were administered again one week after (post-test) the completion of the training to evaluate the effect of the SSGs with floaters training.

Procedure

The training sessions and physical performance tests were conducted in the same environmental conditions, such as a soccer field. On the testing day, all participants completed the same eight-minute warm-up before the tests, including multi-directional lunges and bodyweight squats combined with mild running and dynamic stretches. After the warm-up, subjects were given two practice trials for each test. Consistent feedback was provided throughout to ensure proper technique. These tests were conducted in a single session. The participants were instructed to avoid any strenuous exercise for at least 24 hours before testing. Furthermore, players were advised to refrain from consuming caffeine or other stimulants that might affect their natural performance. They were also reminded of the importance of maintaining proper nutrition and optimal hydration 48 hours before the testing session. The participants performed vertical jump tests with barefoot and maximal aerobic endurance, sprint, and agility testing with soccer boots. The testing sessions consisted of the subsequent sequence of tests: Sargent jump test for leg's explosive strength, 50-meter sprint, Illinois agility test and Yo-Yo intermittent recovery test level 1 for Maximal aerobic endurance (VO_2max).

Yo-Yo Intermittent Recovery Test Level 1

The participants were required to perform 2 × 20 m shuttles. They started with both feet positioned behind the starting line and took breaks by walking to a cone located five meters behind the starting line. The test was controlled by an auditory signal that gradually increased in speed. The test started at a running speed of 10 km/h, increasing by 2 km/h in the next level and by 1 km/h in subsequent levels, with further increases of 0.5 km/h in each subsequent level. At least one foot had to contact the 20-meter line before changing direction and returning to the start point. After each run, there was a 10-second rest period during which participants covered a distance of 10 meters (2 × 5 meters) behind the starting line to prepare for the next repetition. This sequence continued until the participant could not maintain the required pace set by the auditory signal for two consecutive runs. Participants could either voluntarily quit the test or were eliminated if they failed to reach the finish line on time twice. During the test, a yellow card was issued the first time a participant failed to reach the line on time, and the test was terminated with a red card on the second occasion. The score recorded was the distance of the last completed shuttle, converted to meters by multiplying each completed level by 40. The VO_2max could be estimated from the participant's performance in the test using the equation: VO2 max prediction (mL/kg/min) = Yo-Yo IR1 distance (meters) × 0.0084 + 36.4 recommended by (Bangsbo et al., 2008).

Vertical jump

The Sargent jump test was used to evaluate vertical jump performance as a measure of leg explosive strength. A tape measure was fixed to the wall for vertical jump measurement. The participants were standing sideways against a wall and stretching as high as possible with their fingertips. To perform the jump, participants began by standing upright and then lowered themselves into a knee-bent position to a depth of their choice, and they had to jump as high as possible, marking the wall using chalk. The vertical jump was determined based on the distance between the initial standing position and the mark created during the jump. During the execution of the jump, participants were required to maintain continuous movement throughout the descent and propulsive phases. Each subject underwent two assessments with a period of passive rest in between.

Illinois Agility Test

The starting and finishing points of the Illinois agility test are located in a 10-meter-long and 5-meter-wide rectangle. The start and finish points of the trail, as well as the two corners where competitors must turn, are marked with four cones. The testing area was set up with four cones, each spaced 3.3 meters apart. A stopwatch was used to measure the time. The test requires the participant to lie on their front with their hands resting on their shoulders and their head directed towards the start line. At the researchers' "Go" command, the stopwatch was started, and participants promptly stood up and sprinted 10 meters from the starting position to the first corner cone; participants had to touch or cross the tape mark with their feet. After turning around, they returned to the first centre cone and weaved back and forth through the four centre cones. Next, the participant should sprint as fast as possible to the second tape mark located on the far line, where they again needed to touch or cross the end-line tape marks with their foot. Finally, the participants quickly turned and sprinted across the finish line as quickly as possible without stepping on any of the cones. Each subject performed two trials with 2-minute rest intervals. The fastest time was measured in seconds.

50 Meter

The 50-meter sprint tests were performed to assess the maximum speed of the soccer players. The beginning and ending points were clearly indicated with cones. The sprint was timed using a stopwatch. The test was performed twice, with a recovery time of 6 minutes between trials. The individual should be motivated to avoid decelerating before reaching the finishing point. The fastest time from the two sprints was chosen for further statistical analysis. The scores were in seconds.

Statistical Analysis

Mean and standard deviation were calculated for all variables for descriptive statistics. The normality of the

examined parameters was assessed using the skewness and kurtosis test. Paired t-test was used to identify significant changes between the pre-test and post-test variables in both groups. Additionally, the effect of training was assessed using an analysis of covariance (ANCOVA) statistical model, in which baseline data were added as covariates. The size of the difference between the two groups was assessed by computing Cohen's d effect sizes. The interpretation of values was based on the recommendations of Hopkins et al. (2009), categorised as follows: < 0.20 was considered trivial, 0.20–0.60 as small, 0.61–1.20 as moderate, 1.21–2.0 as large, and > 2.0 as very large. The SPSS statistics 21 Packages were used to compute and evaluate all the data. The significance level was set at ≤ 0.05 level. SPSS Statistical package is used as a statistical tool.

Table 1. Characteristics of the participants

Participants	Control Group (M±SD) (n = 26)	Experimental Group (M±SD) (n = 26)
Age	15.60 ± .68	15.40 ± .59
Years of Experience	6.53 ± 1.99	6.43 ± 1.86
Height (cm)	160.70 ± 12.85	161.10 ± 12.08
Weight (Kg)	59.70 ± 3.9	60.10 ± 4.3

Table 2. The small-sided floaters training programme

Format	Size of Field (M) L x W	Regimen	Intensity
1 vs 1 +2 Floaters	6 × 18	6 × 1 min/ 2 min rest	80 %
2 vs 2 +2 Floaters	12 × 24	6 × 2 min/ 2 min rest	88 %
3 vs 3 +2 Floaters	18 × 30	6 × 3 min/ 2 min rest	92 %
4 vs 4 + 4 Floaters	24 × 36	6 × 4 min/ 2 min rest	91 %
5 vs 5 + 3 Floaters	30 × 35	6 × 4 min/ 2 min rest	93 %
6 vs 6 + 4 Floaters	30 × 40	3 × 4 min/ 3 min rest	87 %
7 vs 7 + 5 Floaters	64 × 46	3 × 7 min/ 3 min rest	94 %
8 vs 8 + 1 Floater	70 × 45	4 × 8 min/ 1 min rest	88 %
9 vs 9 + 1 Floater	60 × 50	3 × 5 min/ 4 min rest	81 %

Results

Table 3 displays the summary of test results for both the control group and the experimental group. Pre-test comparisons across variables showed no significant differences between groups at the baseline level. The paired t-test results for maximal aerobic endurance revealed a significant improvement between the pre-test and post-test for both the control and experimental groups ($p < 0.05$). The ANCOVA result further revealed a significant difference in maximal aerobic endurance between the control and experimental groups ($F = 4.676$, $p = 0.035$). Paired sample t-test result of leg explosive strength and agility revealed a significant improvement (ES = 0.46, ES = 0.43) for SSGs with floaters training group but no improvement in the control group ($p > 0.05$). The ANCOVA result showed that there is a significant difference between the control and experimental groups in leg explosive strength ($F = 6.452$, $p = 0.014$) and agility ($F = 5.64$, $p = 0.021$). The paired sample t-test results for speed indicated no significant improvement for both the control group and the experimental group. Additionally, the ANCOVA results revealed no significant difference in speed between the control and experimental groups ($F = 0.962$, $p = 0.331$).

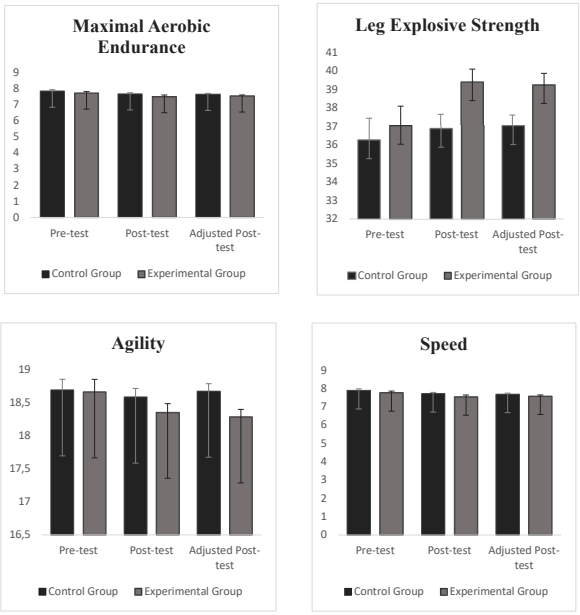

Fig. 2. Graphical presentation of the physical components in the experimental group and control group

Discussion

The primary objective of this study was to assess the effects of a 12-week training program involving SSGs with floaters intervention training on the physical performance,

Table 3. Results summary for all tests performed in the control and experimental groups

Variable	Control Group				Experimental Group				F	ANCOVA, p (after intervention)
	Pre- Test	Post-test	p	Cohen's d	Pre-Test	Post-test	p	Cohen's d		
Maximal Aerobic endurance	43.17 ± 2.87	45.28 ± 3.07	.000*	1.01	41.99 ± 2.33	45.37 ± 2.88	0.000*	2.10	4.676	0.035*
Leg Explosive Strength	36.24 ± 6.20	36.85 ± 4.16	.603	0.11	37.01 ± 5.61	39.41 ± 3.60	0.001*	0.46	6.452	0.014*
Agility	18.70 ± 0.83	18.59 ± 0.68	.589	0.107	18.67 ± 0.98	18.36 ± 0.68	0.037*	0.43	5.64	0.021*
Speed	7.89 ± 0.51	7.72 ± 0.39	.074	0.365	7.77 ± 0.49	7.55 ± 0.53	0.001*	0.726	0.962	0.331

such as maximal aerobic endurance, leg explosive strength, agility, and speed of soccer players. Moreover, the study aims to determine whether the effects of a 12-week training program involving SSGs with floater interventions were more effective in improving physical performance compared to a control group.

The pre-and post-training results show that the experimental group, which underwent SSGs with floaters interventions, showed significant improvement in maximal aerobic endurance ($p < 0.0001$; $d = 2.10$). Our result is consistent with some of the previous studies stating that the use of a floater seems to be more effective in soccer games with a smaller size, and this could be suitable for the maintenance or development of aerobic capacity (Hill-Haas et al., 2010) and also regarding the team size, SSGs with fewer players appear to have a more significant effect on aerobic capacity (Pop et al., 2022). The control group also shows significant improvement in maximal aerobic endurance ($p < 0.0001$; $d = 1.01$). The control group showed a change in maximal aerobic endurance, likely due to their high-intensity daily training load (Table 3). This present study found a significant difference between the experimental and control groups. Compared to the control group, the experimental group showed greater maximal aerobic endurance; similarly, previous research has demonstrated a high increase in VO_2max ability in the small-sided games experimental group compared to the control group (Resah Pratama et al., 2024; Xu et al., 2024). Similarly, Rampinini et al. (2007) suggested that smaller-sided games induce higher physiological stress, resulting in superior cardiovascular adaptations compared to conventional endurance training. In contrast to our result, Thomakos et al. (2023) observed no significant improvement in aerobic fitness within an SSG group. This discrepancy could be attributed to differences in training intensity, duration, or tactical constraints imposed during sessions. Moreover, Aguiar et al.(2013) suggest that in SSGs, coaches can use fewer players, such as 2- and 3-a-side, to enhance cardiovascular effects. Conversely, using more players, like 4- or 5-a-side, can enhance variability and better align with the specific demands of competition. The studies corroborate that modifying the number of players and pitch dimensions directly influences training load, movement patterns, and aerobic responses (Owen et al., 2014; Dellal et al., 2012). The role of floaters in SSGs may provide a key differentiating factor by increasing overall game dynamics, movement variability, and positional play, leading to sustained high-intensity activity (Clemente et al., 2021; Castillo et al., 2018). However, these studies primarily focus on SSGs alone, without incorporating floater interventions, making this study a unique contribution to the field. Practically, integrating small-sided games with floaters can serve as an effective training strategy to enhance aerobic endurance. The inclusion of floaters provides tactical benefits, promoting increased ball possession, sustained movement intensity, and varied positional demands (Sánchez-Sánchez et al., 2018; Köklü et al., 2015). Coaches can optimize training by adjusting team formations, modifying pitch size, and managing the intensity of floater involvement to maximize physiological adaptations.

Analyzing the results in the explosive leg strength, our results suggest that SSGs with floaters intervention significantly improved leg explosive strength ($p < 0.01$; $d = 0.46$). These improvements are in accordance with previous studies explaining that vertical jump performance was significantly enhanced with the implementation of SSGs in sedentary adults, irrespective of sex (Xu et al., 2024), and Karahan (2020) suggests that SSGs were found to be effective in improving the explosive power and vertical jump heights of young soccer players during the pre-season preparation period. Conversely, other research demonstrates that there was no change in muscle power after six weeks of SSGs (Ouertatani et al., 2022). While comparing the difference between the experimental and control groups, the result shows that the experimental group (SSGs with floaters training) exhibited higher leg explosive strength after 12 weeks.

Regarding agility, the results of this study suggest that the 12 weeks of SSGs with floaters intervention significantly improved agility ($p < 0.05$; $d = 0.43$) from pre- to post-training. Our result aligns with other researchers who have found that SSGs enhance agility performance by improving the speed of cognitive decision-making rather than physical movement speed (Young & Rogers, 2014) According to Chaouachi et al. (2014), the SSGs can be an effective approach to enhancing agility and change of direction in elite-level young male soccer players, they also recommend reducing the number of players to improve agility. This study also found a significant difference between the experimental and control groups; the experimental group showed greater agility than the control group. Similarly, Subramani & Arumugam (2015) reported that the SSGs training group showed significant improvement in agility compared to the control group. Additionally, Salazar-martínez et al. (2023) Top of FormBottom of Form found the same stated that compared to the high-intensity interval training group, the SSGs experimental group showed better agility time. However, Karahan (2020) reported that practising skill-based training with maximum intensity might be more useful than small-sided games in enhancing the physical performance variables of young football players during the pre-competitive season. Nonetheless, these studies do not adequately address interventions involving floaters.

Considering the speed, there is no improvement in SSGs with floaters intervention experimental group and control group. Our findings align with the works of Hill-Haas et al. (2009) and Radziminski et al. (2013), who reported that no significant change in speed performance after the SSGs intervention. As Nayıroğlu et al. (2022) noted, this result is anticipated in SSGs because there is often acceleration and deceleration, mainly caused by the reduced dimensions of the playing field and other limitations imposed by the drills. However, a four-week small-sided games training program resulted in a significant enhancement in repeated sprint ability, as evidenced by the decrease in the time taken to complete a 10-meter sprint (Owen et al., 2012). The result regarding speed also shows that there is no significant difference between the experimental and control groups. A similar result was reported by Karahan (2020), indicating that skill-based training helps to improve 20-meter sprint performance in soccer players compared to SSGs. Chaouachi et al. (2014) also found that the control group significantly improved in sprinting longer than 10 meters, and they recommend that this may be possible due to the potential impact of soccer training on short-term anaerobic

fitness. The lack of significant improvements in speed among soccer players in this study could be attributed to the limited training period and the starting level of physical fitness of players.

This study has certain limitations. The main limitation of this study was the small sample size, which limited the generalisations. Hence, it is important to interpret conclusions carefully. Additionally, another limitation of this study was absence of a specific small-sided games group (SSGs without floaters). Another major constraint of the study could be attributed to the fluctuation in climatic circumstances throughout the intervention period, which may have led to varied results. However, this is the first study to analyse a 12-weeks intervention involving SSGs with floaters intervention on the physical performance of soccer players. Furthermore, future investigations should focus on including players from various age groups and skill levels. They should also examine the differences in technical-tactical actions related to the manipulation of floaters' positioning.

Conclusion

The aim of this study was to evaluate the effect of SSGs with floaters intervention on the physical performance of junior soccer players. The findings suggest that SSGs with floaters training significantly improve physical performance variables, including maximal aerobic endurance, leg explosive strength, and agility. However, this specific training did not make any improvements in speed. There is a significant difference between the experimental and control groups in maximal aerobic endurance, leg explosive strength, and agility except for speed, and the experimental group showed significant improvement compared to the control group. The SSGs format, when combined with floaters, is well-suited for soccer training due to the number of opportunities it provides for players to deal with competitive game situations, including numerical imbalances in both attack and defense. Attention should be given to applying SSGs with floaters intervention methods to improve physical performance, incorporating more advanced training concepts to increase training efficiency and effectiveness, thereby enhancing athletic performance. This study highlights the need for further exploration into optimized training methods tailored for young soccer players.

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Conflicts of Interest

There are no conflicts to declare.

References

Kusuma, I. D. M. A. W., Kusnanik, N. W., Lumintuarso, R., Phanpheng, Y., Daniswara, L. D., & Dari, R. W. (2024). The Holistic and Partial Approach in Soccer Training: Integrating Physical, Technical, Tactical, and Mental Components: A Systematic Review. *Retos,* 54, 328-337. https://doi.org/10.47197/RETOS.V54.102675

Michaildis, Y., Bagkos, T., Kaldaras, V., Gissis, I., & Metaxas, T. (2024). The Profile of the Internal Load of Amateur Soccer Players during Official Matches with Formation 1-4-3-3 and Relationships with Indexes of External Load. *Applied Sciences (Switzerland), 14*(1). https://doi.org/10.3390/APP14010258

Mallo, J., & Navarro, E. (2008). Physical load imposed on soccer players during small-sided training games. *The Journal of Sports Medicine and Physical Fitness, 48*(2), 166-171. https://europepmc.org/article/med/18427410

Hoff, J., Wisløff, U., Engen, L. C., Kemi, O. J., & Helgerud, J. (2002). Soccer specific aerobic endurance training. *British Journal of Sports Medicine, 36*(3), 218-221. https://doi.org/10.1136/BJSM.36.3.218

Kvas-Cabral, V. C., Martins, H., Oneda, G., Enes, A., Moraes, I. F., & Leonel, D. F. (2022). Physical, technical, and tactical differences between continental soccer teams participating in the 2018 FIFA World Cup. *Journal of Physical Education and Sport, 22*(6), 1507-1515. https://doi.org/10.7752/JPES.2022.06190

Vella, A., Clarke, A. C., Kempton, T., Ryan, S., & Coutts, A. J. (2022). Assessment of Physical, Technical, and Tactical Analysis in the Australian Football League: A Systematic Review. *Sports Medicine - Open, 8*(1), 1-16. https://doi.org/10.1186/S40798-022-00518-8/TABLES/6

Halouani, J., Chtourou, H., Gabbett, T., Chaouachi, A., & Chamari, K. (2014). Small-Sided Games In Team Sports Training: A Brief Review. *Ournal of Strength and Conditioning Research, 28*(12), 3594-3618. www.nsca.com

Clemente, F. M., Wong, D. P., Martins, F. M. L., & Mendes, R. S. (2014). Acute effects of the number of players and scoring method on physiological, physical, and technical performance in small-sided soccer games. *Research in Sports Medicine (Print), 22*(4), 380-397. https://doi.org/10.1080/15438627.2014.951761

Krustrup, P., Dvorak, J., & Bangsbo, J. (2016). Small-sided football in schools and leisure-time sport clubs improves physical fitness, health profile, well-being and learning in children. *In British Journal of Sports Medicine, 50*(19), 1166-1167). BMJ Publishing Group. https://doi.org/10.1136/bjsports-2016-096266

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

Castellano, J., Casamichana, D., & Dellal, A. (2013). *Influence Of Game Format And Number Of Players On Heart Rate Responses And Physical Demands In Small-Sided Soccer Games.* www.nsca.com

Selmi, O., Ouergui, I., Levitt, D. E., Nikolaidis, P. T., Knechtle, B., & Bouassida, A. (2020). Small-Sided Games are More Enjoyable Than High-Intensity Interval Training of Similar Exercise Intensity in Soccer. *Open Access Journal of Sports Medicine,* 11, 77-84. https://doi.org/10.2147/oajsm.s244512

Hill-Haas, S. V., Coutts, A. J., Rowsell, G. J., & Dawson, B. T. (2009). Generic versus small-sided game training in soccer. *International Journal of Sports Medicine, 30*(9), 636-642. https://doi.org/10.1055/S-0029-1220730

Rampinini, E., Coutts, A. J., Castagna, C., Sassi, R., & Impellizzeri, F. M. (2007). Variation in top level soccer match performance. *International Journal of Sports Medicine, 28*(12), 1018-1024. https://doi.org/10.1055/S-2007-965158

Owen, A. L., Wong, D. P., Paul, D., & Dellal, A. (2012). Effects of a periodized small-sided game training intervention on physical performance in elite professional soccer. *Journal of Strength and Conditioning Research, 26*(10), 2748-2754. https://doi.org/10.1519/JSC.0B013E318242D2D1

Sarmento, H., Clemente, F. M., Harper, L. D., Costa, I. T. da, 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

Davids, K., Araújo, D., Correia, V., & Vilar, L. (2013). How small-sided and conditioned games enhance acquisition of movement and decision-making skills. *Exercise and Sport Sciences Reviews, 41*(3), 154-161. https://doi.org/10.1097/JES.0B013E318292F3EC

Francesco Sgrò, Salvatore Bracco, Salvatore Pignato, & Mario Lipoma. (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). https://doi.org/10.17265/2332-7839/2018.01.002

Castellano, J., Silva, P., Usabiaga, O., & Barreira, D. (2016). The influence of scoring targets and outer-floaters on attacking and defending team dispersion, shape and creation of space during small-sided soccer games. *Journal of Human Kinetics, 50*(2), 153-163. https://doi.org/10.1515/hukin-2015-0178

Moreira Praça, G., Manuel Clemente, F., Gustavo Pereira de Andrade, A., Carlos Perez Morales, J., & Juan Greco, P. (2017). Network Analysis In Small-Sided And Conditioned Soccer Games: The Influence Of Additional Players And Playing Position. *Kinesiology, 49*(2), 185-193.

Lacome, M., Simpson, B. M., Cholley, Y., & Buchheit, M. (2018). Locomotor and Heart Rate Responses of Floaters During Small-Sided Games in Elite Soccer Players: Effect of Pitch Size and Inclusion of Goalkeepers. *International Journal of Sports Physiology and Performance, 13*(5), 668-671. https://doi.org/10.1123/IJSPP.2017-0340

Bangsbo, J., Iaia, F. M., & Krustrup, P. (2008). The Yo-Yo intermittent recovery test: a useful tool for evaluation of physical performance in intermittent sports. *Sports Medicine (Auckland, N.Z.), 38*(1), 37-51. https://doi.org/10.2165/00007256-200838010-00004

Hopkins, W. G., Marshall, S. W., Batterham, A. M., & Hanin, J. (2009). Progressive statistics for studies in sports medicine and exercise science. *Medicine and Science in Sports and Exercise, 41*(1), 3-12. https://doi.org/10.1249/MSS.0B013E31818CB278

Hill-Haas, S. V., Coutts, A. J., Dawson, B. T., & Rowsell, G. J. (2010). Time-motion characteristics and physiological responses of small-sided games in elite youth players: The influence of player number and rule changes. *Journal of Strength and Conditioning Research, 24*(8), 2149-2156. https://doi.org/10.1519/JSC.0B013E3181AF5265

Hill-Haas, S. V., Dawson, B., Impellizzeri, F. M., & Coutts, A. J. (2011). Physiology of small-sided games training in football: A systematic review. *Sports Medicine, 41*(3), 199-220. https://doi.org/10.2165/11539740-000000000-00000

Nagy, N., Holienka, M., Babic, M., Michálek, J., & Kunzmann, E. (2020). Intensity of Soccer Players' Training Load in Small-Sided Games with Different Number of Players. *Acta Facultatis Educationis Physicae Universitatis Comenianae, 60*(1), 55-74. https://doi.org/10.2478/AFEPUC-2020-0005

Moniz, F., Scaglia, A., Sarmento, H., García-Calvo, T., & Teoldo, I. (2020). Effect of an Inside Floater on Soccer Players Tactical Behaviour in Small Sided and Conditioned Games. *Journal of Human Kinetics, 71*(1), 167–177. https://doi.org/10.2478/hukin-2019-0080

Pop, R. M., Grosu, V. T., Grosu, E. F., Zadic, A., Mâță, L., & Dobrescu, T. (2022). The Effects of Small-Sided Games and Behavioral Interventions on the Physical and Motivational Outcomes of Youth Soccer Players. *International Journal of Environmental Research and Public Health, 19*(21). https://doi.org/10.3390/IJERPH192114141

Resah Pratama, R., Fikri, A., & Lubis, J. (2024). The Effectiveness of Small Side Games in Increasing the Vo 2 max Ability of Football Athletes. *International Journal of Human Movement and Sports Sciences, 12*(1), 1-8. https://doi.org/10.13189/saj.2024.120101

Xu, Q., Qi, K., Liu, G., Li, T. Y., & Clemente, F. M. (2024). Effects of a 16-week recreational small-sided games soccer intervention on body composition and physical fitness in sedentary young adults: A randomized controlled study. *Heliyon, 10*(3). https://doi.org/10.1016/J.HELIYON.2024.E25242

Rampinini, E., Impellizzeri, F. M., Castagna, C., Coutts, A. J., & Wisloff, U. (2007). Technical performance during small-sided soccer games: A comparison of different player numbers and field dimensions. *Journal of Sports Sciences, 25*(9), 659-666

Thomakos, P., Spyrou, K., Tsoukos, A., Katsikas, C., & Bogdanis, G. C. (2023). High-Intensity Interval Training Combined with High-Load Strength Training Improves Aerobic Fitness, Match Goals and Match Result during the In-Season Period in Under-19 Soccer Players. *Sports 12*(1), 2. https://doi.org/10.3390/SPORTS12010002

Aguiar, M. V.D., Botelho, G. M. A., Gonçalves, B. S. V., & Sampaio, J. E. (2013). Physiological responses and activity profiles of football small-sided games. *Journal of Strength and Conditioning Research, 27*(5), 1287-1294. https://doi.org/10.1519/JSC.0B013E318267A35C

Owen, A. L., Wong, D. P., McKenna, M., & Dellal, A. (2014). Heart rate responses and technical comparison between small- vs. large-sided games in elite professional soccer. *Journal of Strength and Conditioning Research, 28*(4), 116-125.

Dellal, A., Chamari, K., Owen, A. L., Wong, D. P., Lago-Peñas, C., & Hill-Haas, S. (2012). Influence of the number of players in small-sided soccer games on the physical and physiological demands. *Journal of Strength and Conditioning Research, 26*(10), 2763-2770.

Clemente, F. M., Afonso, J., & Castillo, D. (2021). The effects of small-sided soccer games on tactical behavior and collective dynamics: A systematic review. *Human Movement Science,* 78, 102824.

Castillo, D., Raya-González, J., Weston, M., & Yanci, J. (2018). The influence of different small-sided game formats on physical and physiological demands and technical

performance in young soccer players. *Kinesiology, 50*(2), 150-158.

Sánchez-Sánchez, J., Ramirez-Campillo, R., Carretero, M., & Newton, R. U. (2018). Effects of different small-sided games on endurance, agility, and sprint performance in young soccer players. *Journal of Sports Medicine and Physical Fitness, 58*(1-2), 1-8.

Köklü, Y., Sert, O., Alemdaroğlu, U., & Arslan, Y. (2015). Comparison of the physiological responses to different small-sided games in elite young soccer players. *Journal of Strength and Conditioning Research, 29*(4), 964-971.

Karahan, M. (2020). Effect of skill-based training vs. small-sided games on physical performance improvement in young soccer players. *Biology of Sport, 37*(3), 305. https://doi.org/10.5114/BIOLSPORT.2020.96319

Ouertatani, Z., Selmi, O., Marsigliante, S., Aydi, B., Hammami, N., & Muscella, A. (2022). Comparison of the Physical, Physiological, and Psychological Responses of the High-Intensity Interval (HIIT) and Small-Sided Games (SSG) Training Programs in Young Elite Soccer Players. *International Journal of Environmental Research and Public Health, 19*(21), 13807. https://doi.org/10.3390/IJERPH192113807

Young, W., & Rogers, N. (2014). Effects of small-sided game and change-of-direction training on reactive agility and change-of-direction speed. *Journal of Sports Sciences, 32*(4), 307-314. https://doi.org/10.1080/02640414.2013.82323

Chaouachi, A., Chtara, M., Hammami, R., Chtara, H., Turki, O., & Castagna, C. (2014). Multidirectional sprints and small-sided games training effect on agility and change of direction abilities in youth soccer. *Journal of Strength and Conditioning Research, 28*(11), 3121-3127. https://doi.org/10.1519/JSC.0000000000000505

Subramani, A., & Arumugam, S. (2015). Effect Of Small Sided Games Training On Speed And Agility Among Soccer Players. *International Peer Reviewed Journal, 1*(2), 2395-4396.

Salazar-martínez, J., Geovanny Valencia-sánchez, W., & Manuel Clemente, F. (2023). Comparative impact of small-sided games and high-intensity interval training on physical performance in youth soccer players. *Journal of Physical Education and Sport, 23*(10), 2769-2785. https://doi.org/10.7752/jpes.2023.10317

Radziminski, L., Rompa, P., Barnat, W., Dargiewicz, R., & Jastrzebski, Z. (2013). A comparison of the physiological and technical effects of high-intensity running and small-sided games in young soccer players. *International Journal of Sports Science and Coaching, 8*(3), 455-465. https://doi.org/10.1260/1747-9541.8.3.455

Nayıroğlu, S., Yılmaz, A. K., Silva, A. F., Silva, R., Nobari, H., & Clemente, F. M. (2022). Effects of small-sided games and running-based high-intensity interval training on body composition and physical fitness in under-19 female soccer players. BMC Sports Science, Medicine and Rehabilitation, 14(1), 119. https://doi.org/10.1186/s13102-022-00516-z

Вплив ігор неповними складами та інтервенції із застосуванням позиції флоатерів на показники фізичних компонентів футболістів

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Авторський вклад: A – дизайн дослідження; B – збір даних; C – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 9 с., 3 табл., 2 рис., 47 джерел.

Історія питання. Чисельна перевага у футболі підвищує ефективність як атакувальних, так і захисних дій, що виконуються гравцями. Щоб поліпшити результативність гравців, слід включати у тренувальні заняття ігри неповними складами (SSGs) із чисельною меншістю та перевагою.

Мета дослідження. Мета дослідження полягала в оцінюванні впливу 12-тижневої програми тренування із застосуванням позиції флоатерів та ігор неповними складами (SSGs) на фізичну працездатність футболістів.

Матеріали та методи. У дослідженні взяли участь 52 футболісти. Вік гравців коливався від 14 до 16 років. Учасників було розподілено на групу із проведенням ігор неповними складами із застосуванням позиції флоатерів (група I, SSGs+Floaters, n = 26) та контрольну групу (група II, n = 26). Експериментальна група пройшла 12-тижневу програму із впровадження ігор неповними складами, що передбачала проведення інтервенції із застосуванням позиції флоатерів, тренуючись п'ять днів на тиждень. Кожне заняття тривало 90 хвилин і включало в себе розминку, ігри неповними складами із проведенням інтервенції, що передбачала застосування позиції флоатерів, підвідні ігри та приведення організму до нормального стану після тренування. У контрольній групі програма тренувань із застосуванням позиції флоатерів не практикувалася. З метою оцінки максимальної аеробної витривалості (VO_2max) використовувався тест Йо-Йо з переривчастим відновленням рівня 1, для вимірювання вибухової сили ніг — стрибковий тест Сарджента (вертикальний стрибок), для оцінки футбольної спритності — Іллінойський тест на спритність, а для оцінки швидкості —спринтерський тест на дистанцію 50 метрів. Для вимірювання внутрішньогрупових відмінностей показників на етапах перед та після завершення тестування було проведено тест із застосуванням t-критерію для парних вибірок, а вплив тренувань оцінювали за допомогою коваріаційного аналізу (ANCOVA) та аналізу розміру ефекту.

Результати. Результати дослідження показали, що ігри неповними складами із проведенням інтервенції, яка передбачала застосування позиції флоатерів, сприяли значному покращенню показників максимальної аеробної витривалості, вибухової сили ніг та спритності, за винятком швидкості. Натомість контрольна група не продемонструвала подібних позитивних змін. Крім того, між експериментальною та контрольною групами спостерігалася суттєва різниця у показниках максимальної аеробної витривалості, вибухової сили ніг та спритності, проте щодо швидкості такої відмінності не встановлено.

Висновки. Отримані дані свідчать про те, що впровадження ігор неповними складами та інтервенції із застосуванням позиції флоатерів сприяє ефективному підвищенню показників фізичної працездатності юних футболістів.

Ключові слова: ігри неповними складами, тренування флоатерів, VO_2max, спритність, вибухова сила ніг, швидкість.

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