

Small-sided game activities impact the specific motor skills and skill-related competencies of football players between the ages of 12 and 14 years

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Abstract:

This research aims to investigate the effects of S.S.G. exercises on motor and skill competencies in individuals aged 12 to 14 years. The playing style fulfills several objectives for coaches to enhance the proficiency of their players, particularly in age-specific categories. Motor abilities immediately influence skill capabilities, thereby conferring a significant advantage to the team. Age groups require emphasis since they constitute the essential foundation for elite teams and the extensive base for national teams. Consequently, they ought to be advanced to more rigorous and meticulously designed training to attain superior performance levels. The experimental approach employed a one-group design, with a sample including 15 players from the Baghdad Karkh Sports Talent Center for football. A collection of instruments was utilized, comprising goals of diverse heights and dimensions, ten regulation soccer balls, cones and markers, training platforms of varying elevations, a POLAR-TEAM intensity measuring device, and a protractor. The statistical software (SPSS) was utilized to compute the mean, median, standard deviation, skewness, and T-test for linked samples. The researchers determined that the motor and skill abilities of the study group improved at varying rates; nevertheless, the effectiveness regarding endurance and rolling speed was limited. The activities executed resulted in a more significant enhancement in skill capabilities relative to motor abilities. The implementation of applied exercises tailored for various age groups in training centers involves the design of diverse exercises, configurations, and environments, as well as the number of participants. Additionally, it focuses on developing more effective playing strategies and underscores the utilization of

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modern equipment to precisely calibrate training intensity standards, including the system. POLAR-TEAM.

Keywords: passing precision, rolling velocity, agility.

Introduction:

The contemporary game of football has garnered the interest of researchers, experts, and enthusiasts due to the swift advancements in training and playing techniques, generating excitement and delight for players, coaches, and fans alike. The advancement in football is attributable to a holistic endeavor encompassing disciplines associated with physical education and sports sciences. The use of these sciences is regarded as a robust foundation for attaining optimal outcomes, guiding us towards future achievement, contingent upon effective planning. The variety of contemporary training methods enhances players' performance in alignment with the advancement of modern playing techniques. Therefore, it is crucial for us as researchers to identify the most effective training methodologies that can adapt to the advancements in specialized activities and navigate the evolving dynamics of football. Small-sided games (S.S.G.) are regarded as a training approach that alternates between generating excitement and imitating competitive environments, culminating in the skill of scoring, which is the logical conclusion to every offensive endeavor. The S.S.G. must consistently incorporate physical, technical, tactical, and mental dimensions to enhance the efficacy of the training units. (Doewes et al., 2020).

The S.S.G. exercises are a training method that utilizes a scaled-down football match, facilitating increased ball contact and promoting continuous movement for players without extended pauses. Training methods are regarded as the fundamental and contributory factor in the coach's engagement with players, seeking to cultivate their skills in accordance with the demands of contemporary football. The researchers assert that football schools in Iraq employ conventional training techniques, frequently resulting in monotony for numerous players. The researchers, serving as instructors in football academies, want to implement training methods that actively involve players and enhance their motivation for training and development. Consequently, the researchers proposed the implementation of contemporary training exercises that correspond with the demands of modern football, marked by fluctuating competitive scenarios. Consequently, the research subject encompasses two aspects: firstly, the deficiency in certain motor skills and fundamental abilities of the athletes. Secondly, there is a lack of diversity in modern training approaches.

Minor games enhance motivation and exhilaration in training by fostering teamwork, mirroring the dynamics of a football match through the application of fundamental abilities. (Ali, 2022). Small games play a crucial role in establishing a physical and skill-based foundation, enhancing player effectiveness within a team, and fostering a competitive

mindset, all of which are essential for skill mastery and improvement (Ali, 2022). (Jameel and Laidh, 2019). The recent exercises employing the small-sided games methodology enhance the participants' performance levels, capacities, and talents. (Alhayali & Khalif, 2022). Consequently, foundational training for age groups should prioritize motor abilities or skills, since they are essential for establishing an appropriate training trajectory from a young age, surpassing the importance of individual physical attributes, although the latter should not be substantially overlooked. Consequently, it is essential to incorporate short games in the acquisition of motor abilities. (Nazar, A., & Aladdin, 2018). These activities enhance specific physical capabilities and augment the motor speed of young football players. (Alrubae and Kareem, 2015).

Method and tools:

The experimental approach employed a one-group design, with a sample including 15 players from the Sports Talent Center for Football in Baghdad, Karkh. A collection of equipment was utilized, comprising goals of diverse heights and dimensions, ten regulation footballs, cones and markers, training benches of varying sizes, a protractor, and a strain monitoring apparatus. POLAR-TEAM.

Tests:

Initial: Performance endurance assessment (60 seconds) average (Asliyo, 2022, p. 74):

The objective of the assessment is to evaluate performance endurance. The instruments utilized comprise a platform measuring $0.5 \times 0.5 \times 2$ meters and a soccer ball. Upon hearing the whistle, the player strikes the ball from a distance of 2 meters towards a 2-meter-wide platform and continues to pass after the ball rebounds for 60 seconds. The quantity of passes executed by the player within a 60-second interval is recorded.

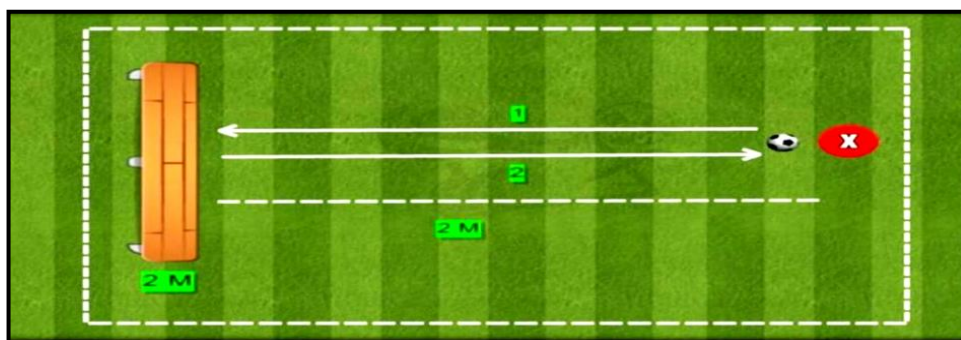


Figure (1) Performance endurance test (60 seconds)

Secondly: Reactive Agility Test (Pojskic, et al., 2018):

The objective of the test is to assess the duration of reactive agility. The instruments employed included six markers, a stopwatch, a measuring tape, and a protractor to ascertain the angles. The tester begins at the starting line and accelerates to maximum velocity in a straight trajectory of 5 meters. At this point (Trigger-Gate), the individual positioned at the conclusion of the assessment (Reactive-Gate) randomly elevates their arm to the right or left for each trial. The tester must react to the signal and complete the test. Exit Gate. The mean duration of the six trial efforts is computed.

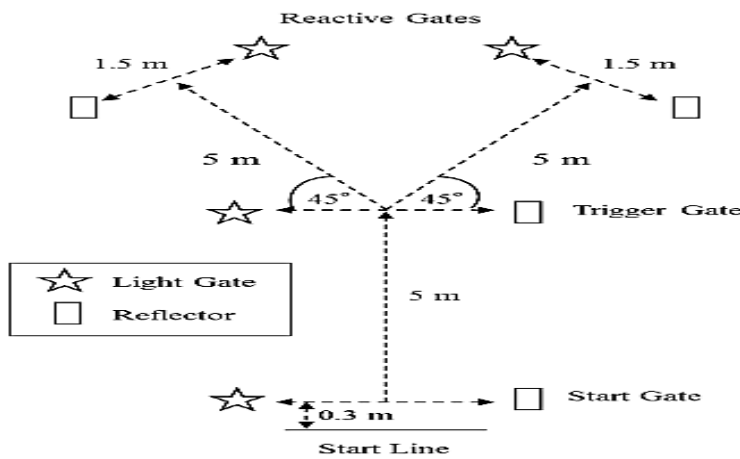


Figure (2) Reactive Agility Test (Reactive Agility)

Third: Motor speed assessment (Asliouh, 2022, p. 73):
 The purpose of the test is to assess kinetic velocity. The instruments employed comprised a whistle, a stopwatch, two platforms (0.5×2 meters), a soccer ball, and a measuring tape. Upon hearing the whistle, the player kicks a single ball from a distance of 1.50 meters toward two opposing platforms, each situated 2 meters away. The ball is exchanged back and forth for 10 seconds, utilizing the same ball and moving in opposite directions toward the platforms. The quantity of passes executed by the player within a 10-second interval is recorded.

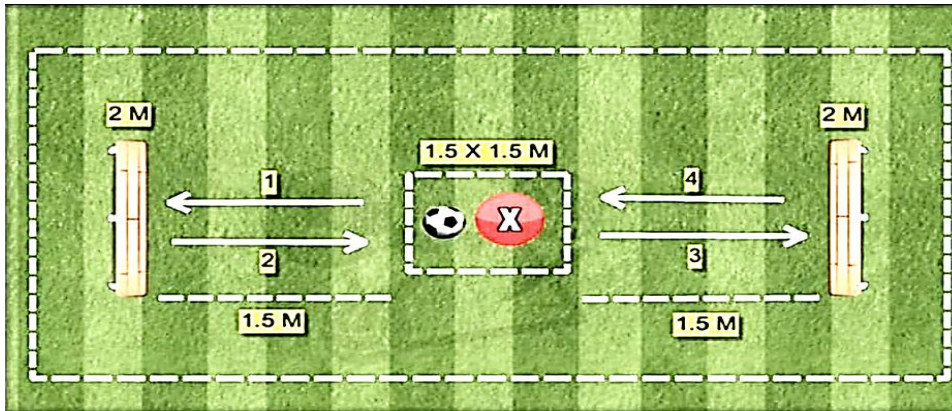


Figure (3) Motor Speed Test

Fourth, the passing accuracy assessment (Raad, 1999):

The objective of the test is to assess the precision and velocity of passing to a small target situated 15 meters distant. The equipment utilized included five soccer balls, one goal measuring 1×0.75 meters, a measuring tape, and colored adhesive tape. The beginning line is established at a length of one meter, positioned fifteen meters from the little goal, with five balls arranged along the starting line. Upon the sounding of the starting whistle, the tester consecutively passes these balls toward the little goal. The overall score achieved by the tester from successfully passing five balls is determined by dividing it by the total performance duration as follows: 2 points for each successful attempt, 1 point if the ball contacts the post or crossbar without entering the goal and 0 points if the ball exits the small goal.

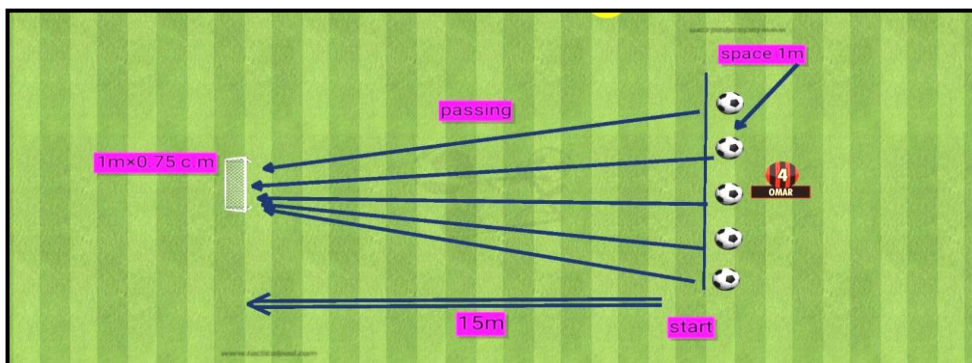


Figure (4) Handling Accuracy Test

Fifth: Rolling Speed Test (Ismail, 2002): The objective of the test is to assess the capacity for rapid rolling while altering direction (particular agility). The required equipment comprises a specified area with a starting line positioned 2 meters from the first

marker, followed by four markers spaced 1.5 meters apart, resulting in a total test distance of 8 meters and a total of 5 markers, in addition to a soccer ball. Upon receiving the start signal, the player swiftly rolls the ball, navigates past the five markers, and returns by traversing the markers to reach the start and finish lines in the minimum time achievable. The player may initiate passing the first marker from either the right or left side. If the ball exits the player's control, the attempt is deemed invalid. The participant is allotted two attempts, with the superior recorded time being considered. If the player surpasses one of the markers, the attempt is deemed invalid. The time is measured to the nearest 0.01 second.

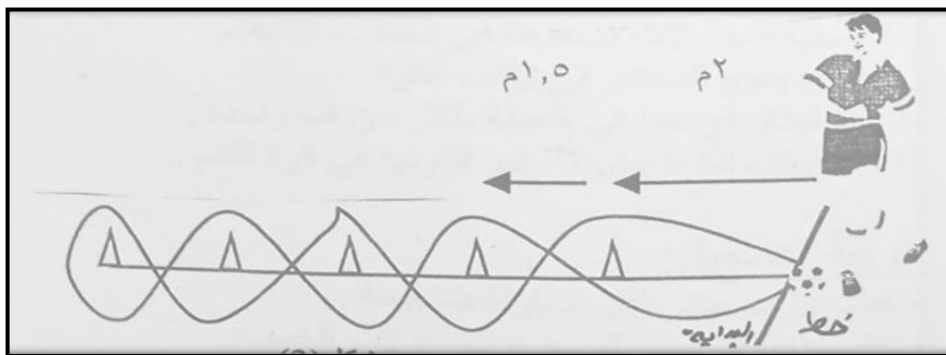


Figure (5) Rolling speed test

The sixth step is the ball reception and delivery assessment (Zuhair et al., 1999). The required equipment consists of five markers, five tiny goals measuring one meter in width and 0.5 meters in height, and five regular footballs. Five players are positioned in a linear arrangement with a separation of 2 meters between each individual, and five goals are situated 30 meters in front of them. The test player is positioned centrally between player one and goal one. Upon receiving the start signal, the test player obtains the ball from player number 1, swiftly pivots inside a designated radius of 2 meters situated centrally between the five goals and the sideline, and thereafter directs the ball towards goal number 1. This procedure is reiterated with the remaining teammates. The five players may pass the ball at varying elevations (ground level, medium height, high), and the test player is required to direct the ball towards the five goals while maintaining proximity to the ground. The ball's reception and control determine scoring. A point is granted for maintaining control within the specified 2-meter region, whereas no point is scored if the ball exits this zone. No points are granted for a missed target; however, one point is earned for each successful strike.

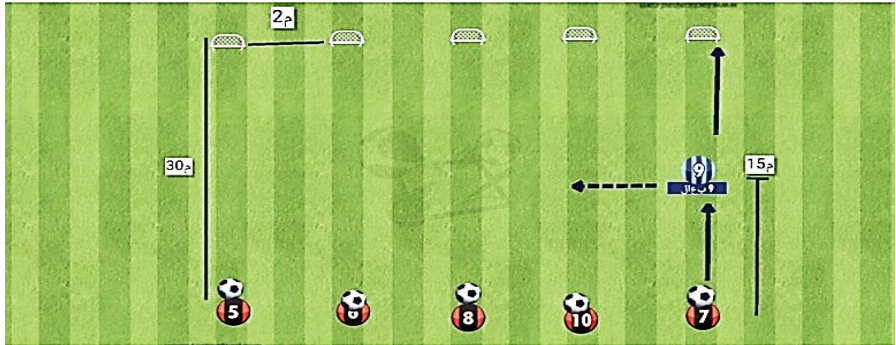


Figure (6) Acceptance and Delivery Test

The experiment:

Following the exploratory experiment on Saturday, January 7, 2023, the pre-tests for the skill assessments were administered on Wednesday, January 11, 2023, and the motor ability evaluations took place on Thursday, January 12, 2023. The researchers commenced the primary experiment on Saturday, January 14, 2023, which involved workouts tailored to S.S.G. games, incorporating three training sessions per week for each group on Saturday, Monday, and Wednesday. The course spanned 12 weeks, comprising 36 training units over a 3-month period. Each training unit had two exercises, each lasting 12 minutes, resulting in a total length of 24 minutes. The exercise intensity was determined using the Karvonen method and tracked via POLAR.TEAM, with intensities fluctuating between 70% and 85%.

The target heart rate is calculated by subtracting the age from the desired intensity. Training unit difficulty: Total (exercise volume × partial intensity)..... (2). Subsequent to the primary experiment, the post-skill assessments were administered on Wednesday, April 19, 2023, and the motor ability evaluations took place on Thursday, April 20, 2023.

The target heart rate is calculated by subtracting the age from the desired intensity. Training unit difficulty: Total (exercise volume × partial intensity)..... (2). Following completion of the primary experiment, the post-skill analyses were administered on Wednesday, April 19, 2023, and the motor ability evaluations took place on Thursday, April 20, 2023.

Results Table (1) Values of the Pre-Test and Post-Test Differences

Variables	The groups	S-	A±	F -S	A - F	H- A	T	Sig
1- Endurance performance/ Repetition	Before	35.73	2.02	-.400	.910	.235	1.702	.111
	After	36.13	1.64					
2- Interactive gility/ Thaa	Before	3.08	.262	.143	.129	.033	4.307	.001
	After	2.94	.235					
3- Speed Kinetic/ Repetition	Before	6.47	.834	-.400	.507	.131	3.055	.009
	After	6.87	.743					
4- Accuracy handling (m/s)	Before	.498	.146	-.084	.062	.016	5.211	.000
	After	.582	.130					
5- Speed Rolling/ sec	Before	10.28	1.19	.204	.455	.117	1.738	.104
	After	10.07	1.05					
6- Receiving and delivering The ball/ degree	Before	4.87	.990	-1.00	.655	.169	5.916	.000
	After	5.87	.743					

Degrees of freedom = 14... Significant at (Sig) ≤ (0.050).

Discussion:

A primary advantage of S.S.G is the enhanced engagement of players in executing appropriate passing decisions while preserving the essential contrasting attributes of the game. The examination of this subject is presently among the most debated topics in modern football research. Optimal benefits are attained when training stimuli reflect competition demands to cultivate technical and tactical proficiency in accordance with the exigencies of actual gameplay. (Hill-Haas et al., 2010). These games are optimal for enhancing training by fulfilling diverse physical fitness criteria alongside skill development and tactical decision-making. Consequently, they are extensively employed to improve fitness levels alongside technical and tactical abilities through many elements, including the number of participants, the dimensions and configuration of the field, the length of training sessions, and recovery intervals. Numerous studies have demonstrated that they influence players' physiological responses regarding endurance and speed by enhancing lactic components and aerobic capacity. (Jones & Drust, 2007). Furthermore, research indicates that S.S.G., in conjunction with enhancements in aerobic and anaerobic endurance, has contributed to advancements in players' performance regarding change of direction, agility, and technical skills across various age demographics (Dellal et al., 2011; Jensen et al., 2007). (Mallo, 2008). The researchers say that the differences in improvements in aerobic and anaerobic endurance are due to the type of workout program, which includes the number of participants, the space used, the length of the performance, and the breaks between sets. The training unit's objective drives the modification of these elements.

The data analysis findings indicated an enhancement in passing accuracy following a 6-week training session. These games are frequently employed in training sessions to enhance the physical and technical capabilities of football players. They consistently incorporate elements of physical, technical, tactical, and mental training to enhance efficiency. They constitute a training method executed like a football match on a smaller pitch, facilitating increased ball contact. (Santos et al., 2022). Generally, small-sided games (S.S.G.) involving fewer participants can elicit a faster heart rate compared to larger player setups. Compact gaming forms may be appropriate for either preserving or enhancing aerobic fitness by adjusting workout duration. Research has demonstrated that greater field sizes conceal the effects of variations in player numbers. Diverse field dimensions and configurations can provoke physiological and perceptual reactions, as well as motor activity from players at particular moments. Coaches can modify training intensity by altering field dimensions. (Kelly & Drust, 2008)and (Salman et al., 2022).

The researchers concur that an expanded field size obscures disparities among players, whether in skill or physicality, as a wider area facilitates increased mobility, diminishes the challenges of passing and receiving precision, and permits extended rest

intervals for players. This can be alleviated by instituting shorter training durations with intermediate rest intervals. Field dimensions suggest that training on a larger field enhances aerobic activity, attaining the lactate threshold at an exercise intensity between 61% and 76%. Nonetheless, prior research varies on this matter, with some indicating a lack of agreement on the influence of field size on players' physiological responses. The extended duration of the game may impact speed, causing participants to diminish their playing tempo. (Carling & Bloomfield, 2010)and (Mahmood & Kadhim, 2023).

The researchers believe that effective playtime can provide a potential explanation for the differences in physiological and physical effort, implying that coaches should carefully consider the size of the field if the goal of the exercise is to combine physical training stimulus with skill training or to minimize physical effort while increasing skill demands. When comparing long, continuous game execution times to brief, intermittent periods, it was discovered that players obtained faster speed repetitions and a higher running percentage when compared to continuous. One possible explanation for these findings is that the comparatively long rest intervals between exercises enabled improved recovery. (Fanchini et al., 2011)and (Hammood et al., 2024).

The researchers believe that S.S.G. (Small-Sided Games) are modified game forms in which the coach adds or subtracts the number of participating players to develop the team's tactical situation through movement instructions, positioning, and the player's quick solutions. Manipulating these formats has an instantaneous impact on players' reactions, particularly in terms of tactical behaviors, technical execution, physiological and physical requirements, and cooperative play. This can happen throughout several weeklong training sessions. (Clemente et al., 2020)and (Mohsen et al., 2024).

The researchers believe that the impacts indicated in (S.S.G) on tactical, technical, physiological, and physical conditions may vary depending on age group, amount of expertise, and fitness condition. While these games may enhance players' tactical, technical, and physical behaviors due to their resemblance to real-world play demands, it's likely that these adaptations won't be uniform for all players. However, based on the results of the tables and observations of players during training sessions, these games primarily affect internal physiological variables, which in turn improve the efficiency of external variables represented by physical variables, increasing the player's skill and tactical ability. As a result, they can be used to improve player adaptation to game conditions as well as harmony. According to studies, reaction time increases after physical fatigue during match periods because the player is unable to maintain performance at a level that matches the intensity of the game. This leads to a loss of efficiency in the neuromuscular recruitment mechanism, resulting in increased time for skillful and physical movements within the game's characteristics (Frýbort et al., 2016)and (Abdulhussein et al., 2024). In terms of players' overall technical ability, research has shown that physical weariness caused by insufficient

endurance training has a negative impact on the fundamental tactics of passing, dribbling, and kicking. Research in this subject has demonstrated that physical exhaustion has a negative impact on leg muscle strength and movement biomechanics. Reduced endurance and early fatigue tend to have a negative impact on technical basics that rely on movement precision and efficiency. (Snyder et al., 2019).


In terms of the pass's technical foundation, accuracy was reduced, as were the negative consequences of physical involvement on the pass, which resulted in a fall in short pass accuracy and an increase in committed errors. These findings lend support to the idea that a general decrease in endurance has a negative impact on activities including player movements and path changes based on the game situation. (Moniz et al., 2020) and (Easa et al., 2022). Furthermore, some studies have found that the technical basis for intercepting a pass is unaffected by the player's physical and physiological condition, with no change in the number of attempts or percentage of correct responses to ball interceptions after inducing physical fatigue. However, when their stamina and ability declined, players became less motivated to perform the interception. (Barte et al., 2020) and (Kadhim, 2023).

• Conclusions:

The researchers' S.S.G. game workouts resulted in improvements in the research group's motor and skill capacities at varying rates. However, they were not particularly effective in terms of endurance or rolling speed. The game workouts that were developed resulted in a faster rate of improvement in skill abilities than in motor abilities. The implementation of applied exercises for different age groups in training centers, along with the design of exercises with various shapes and spaces, as well as the number of players, has been implemented. Additionally, more effective playing strategies have been developed for these exercises, and the use of modern devices to accurately adjust training intensity standards, including the system, has been emphasized. (POLAR-TEAM).

• Appendix:

Appendix (1) Model for Training Units

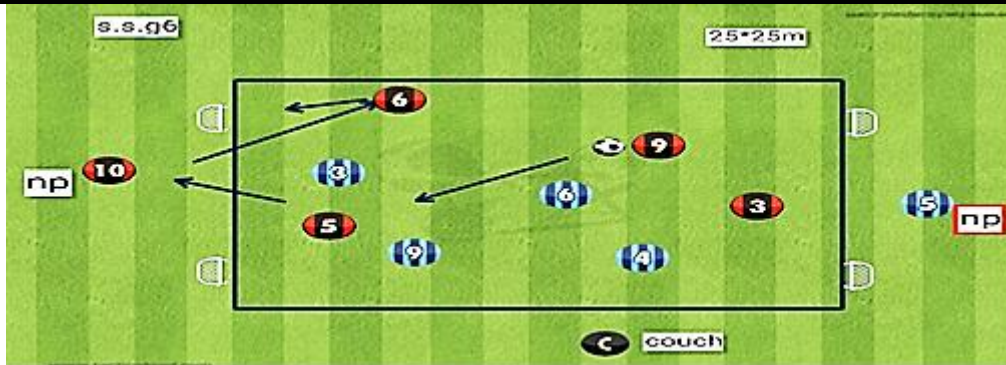
(First month):	First week,	Training unit	1
Exercise 1			
<p>• The playing space measures (25x25)m.</p> <p>The training name is Match with Multiple Small Goals.</p> <p>The number of players is four against four.</p> <p>Tool used: Cones + jerseys (red and blue) + (4) mini goals + balls. We have red and blue sweaters and shirts, along with four small goals and balls.</p> <p>Total exercise time: 16 minutes.</p> <p>Three repetitions multiplied by four minutes equal twelve minutes.</p> <p>Rest for 2 minutes in between repetitions. Rest for two minutes in between repetitions.</p> <p>Intensity: 70%, (144) reps per minute.</p>		<p>• The playing space measures (25x25)m.</p> <p>The training name is Match with Multiple Small Goals.</p> <p>The number of players is four against four.</p> <p>Tool used: Cones + jerseys (red and blue) + (4) mini goals + balls. We have red and blue sweaters and shirts, along with four small goals and balls.</p> <p>Total exercise time: 16 minutes.</p> <p>Three repetitions multiplied by four minutes equal twelve minutes.</p> <p>Rest for 2 minutes in between repetitions. Rest for two minutes in between repetitions.</p> <p>Intensity: 70%, (144) reps per minute.</p>	
			
Exercise 2			
<p>• Key training points:</p> <p>1. Improving attention and awareness for an aim on an unequal side. Attention and awareness are directed toward each goal on</p>		<p>Play area: (20 × 20) m.</p> <p>The training is named "Match with multiple Small Goals."</p> <p>Number of players: four against four.</p>	

<p>qual sides. Keeping the ball within the body (protecting Maintaining the ball within the body Protecting it). Assisting the player in possession of the ball. Supporting the player in possession of the ball. Timing of support. Timing while in help mode. Spread throughout the field. Spreading across field.</p> <p style="text-align: center;">Training Objectives:</p> <p>(3) vs. (4), a team defends two goals and scores two. Scoring accuracy is comparable to a pass Kicking accuracy like a pass. Physical performance (endurance plus speed agility while dribbling past an opponent). Physical performance (endurance plus speed and agility while dribbling the opponent).</p>	<p>Tools used: Cones + small goals + shirts (red + blue) + balls. We have cones, small goals, shirts in red blue, and balls. Total exercise time: (16) minutes. (3) repetitions × (4) minutes = (12) minutes. Rest between repetitions: 2 minutes. Rest between repetitions: (2) minutes. Intensity: 70%, 144 reps/min.</p>
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<p>During the first month, the first week of Training Unit 2 includes Exercise 1.</p>	
<p>The primary focus of training is to create documentation for the ball holder. You should pass ball to the player who is holding it. Pay attention and keep your head up. Pay attention lift your head.</p>	<ul style="list-style-type: none"> • The playing space measures (25m). <p>The training name is Match with Multiple Goals. There are four players competing against</p>

<p>Speed when changing directions with the ball. ned when shifting direction with the ball.</p> <p>Training</p> <p>precise passing and shooting. Accuracy in passing shooting.</p> <p>Working on passes with a neutral player. You are cticing passes with a player who is impartial. numerical edge with touches. A numerical increase touches.</p> <p>The supporting player assists during the attack but s not participate in the defense. The supporting ver's role is to assist with the offense rather than to rvne in defense.</p> <p>Physical training (endurance, speed, and reactive ity). Engaging in physical training enhances ormance endurance, speed, and reactive agility.</p>	<p>n other, plus one neutral player.</p> <p>The tools utilized were:</p> <p>Cones, small goals, red and blue shirts, neutral green balls are used.</p> <p>Total exercise time: 18 minutes.</p> <p>Three repetitions multiplied by four utes equal twelve minutes.</p> <p>est 3 minutes between repetitions. Rest three minutes between repetitions.</p> <p>ensity: 70%, (144) reps per minute.</p>
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Exercise 2

- | | |
|--|---|
| <ul style="list-style-type: none"> • Playing field measures 25 x 25 meters. <p>the training program is called Match, and it includes eral smaller goals.</p> <p>Each team consists of three players.</p> <p>Tools used:</p> <p>Cones, small goals, red shirts, blue, green, and ow balls are used. We have cones, small goals, red ts, blue, green, yellow, and balls.</p> | <ul style="list-style-type: none"> • The playing space measures (x25) m . <p>the training name is Match with Multiple Goals.</p> <p>here are a total of 12 players, with three nbers on each team.</p> <p>Tool used:</p> <p>Cones, miniature goals, red shirts, blue,</p> |
|--|---|

Total exercise time: 18 minutes.
 Three repetitions multiplied by four minutes equals
 total of twelve minutes.
 Allow 3 minutes of rest between repetitions. The
 periods between repetitions are three minutes.
 intensity: (70%), 144 repeat per minute.

en, and yellow balls are used. The items
 include cones, miniature goals, red shirts,
 e, green, and yellow balls.
 Total exercise time: 18 minutes.
 Three repetitions multiplied by four
 utes equal twelve minutes.
 rest 3 minutes between repetitions. Rest
 three minutes between repetitions.
 intensity: 70%, (144) reps per minute.



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