ORIGINAL ARTICLE

The effect of tactical visual scanning exercises on a number of visual abilities of deaf soccer players

Ayman Mahmood Basher . *College of Physical Education and Sports Sciences. University of Mosul. Nineveh, Iraq.*
Mahmood Hamdoon Yonis. *College of Physical Education and Sports Sciences. University of Mosul. Nineveh, Iraq.*

ABSTRACT

The present study aimed at revealing the differences in a number of visual abilities between the experimental and control groups in the post-test. The researchers used the experimental method, and the experiment has been implemented on a sample of (20) advanced players from the National Paralympic Committee in Nineveh. They have been divided into two groups, with (10) players for each group. The research procedures includes designing tactical visual scanning exercises, which have been applied to the experimental group. The experimental group carries out the tactical visual scanning exercises, while the control group carries out the curriculum has been prepared by the team coach. The implementation of the experiment takes (8) weeks, with (3) training units per week. After that, the researchers conduct visual ability tests after the experiment ended on the two research groups, using the same procedures and steps followed in the pre-tests. The data have been statistically processed using SPSS to obtain the mean, standard deviation, percentage, t-test for related samples, t-test for independent samples, Shapiro test for normal distribution, Levene's test for homogeneity, Eta Squared test to determine the effect size for independent samples, and Cohen's d test to determine the effect size for related samples. The most notable results are that the visual scanning exercises performed by the experimental group improved all visual abilities, as demonstrated by comparing the pre- and post-test results of all abilities of the experimental group players.
Keywords: Sport medicine, Optical surveillance, Hearing impaired, Visual variables.

Cite this article as:
Basher, A. M., &, Yonis, M. H. (2025). The effect of tactical visual scanning exercises on a number of visual abilities of deaf soccer players. *Journal of Human Sport and Exercise, 20*(4), 1322-1331. https://doi.org/10.55860/zq34qg38

Corresponding author. *College of Physical Education and Sports Sciences. University of Mosul. Nineveh 41002, Iraq.*
E-mail: aymen.23ssp19@student.uomosul.edu.iq
Submitted for publication June 17, 2025.
Accepted for publication August 11, 2025.
Published August 23, 2025.
Journal of Human Sport and Exercise. ISSN 1988-5202.
©Asociación Española de Análisis del Rendimiento Deportivo. Alicante. Spain.
doi: https://doi.org/10.55860/zq34qg38

INTRODUCTION

Sports for the disabled is one of the sports that seeks to achieve raising the capabilities of the disabled individual and his physical and intellectual potential, and to refine and prepare his personality and rehabilitate him in a way that ensures his correct educational preparation. It is the means through which the disabled individual can get closer and integrated in the society, to eliminate the state of isolation and seclusion that he encounters as a result of his disability. Therefore, the process of rehabilitating the disabled in sports is a phenomenon that expresses the developed society, and an awareness of the responsibility of the importance of caring for this social segment, to play its positive role in the sports field. Jordet (2020) notes that tactical visual scanning is the process by which players move their heads to monitor their surroundings during a match, detecting the positions of teammates, opponents, and empty spaces. This helps them make better tactical decisions before receiving the ball or during critical moments. This behavior is considered as part of visual perceptual skills that enhance situational awareness and reduce opposing pressure (Jordet, 2020).

In parallel, the integration of cognitive and perceptual training within sports, especially for athletes with disabilities, has garnered increasing attention in recent years. For instance, Jordet highlights that tactical visual scanning—the systematic head movements to monitor the surrounding environment—is a key factor in tactical awareness. This scanning behavior allows athletes to perceive the positions of teammates, opponents, and open spaces, thereby enhancing decision-making under pressure (Jordet, 2020). While McGuckian, et al., 2018, indicate that visual abilities are the cognitive skills associated with processing visual information during a game, such as tracking the movement of the ball and players, estimating distances, detecting gaps, and predicting opponents' movements. These abilities include peripheral vision, rapid visual focus, and quick decision-making based on visual input, which contribute to improving players' tactical and technical performance (McGuckian, et al., 2018). Similarly, McGuckian et al. emphasize the importance of visual cognitive skills in sports performance. These include abilities such as peripheral vision, depth perception, anticipation of opponents' moves, and dynamic visual acuity, all of which contribute to effective gameplay and technical execution (McGuckian and Pepping, 2018). Sports for individuals with disabilities represent a vital domain that seeks not only to enhance the physical and intellectual capabilities of disabled persons but also to provide a structured platform for personal development, social integration, and psychological rehabilitation.

Through regular physical activity and organized competition, individuals with disabilities are afforded the opportunity to overcome the constraints imposed by their impairments and to express themselves in ways that foster confidence, autonomy, and social belonging. This approach aligns with the modern societal values of inclusivity and equal opportunity, as sport becomes a vehicle for breaking the isolation and marginalization commonly experienced by disabled populations (Winnick and Porretta, 2016) (DePauw and Gavron, 2005). Inclusive sports play a transformative role in improving the quality of life of participants by strengthening motor skills, enhancing cognitive function, and promoting emotional resilience. As noted by DePauw and Gavron, sport participation supports the reconstruction of identity for individuals with disabilities and reinforces a sense of normalcy through structured physical engagement (Bailey, 2006). Moreover, sport serves as an educational medium, reinforcing discipline, teamwork, and perseverance—qualities essential for successful integration into broader society (Block and Obrusnikova, 2007). For disabled athletes, training these cognitive-perceptual functions becomes even more critical to compensate for potential sensory or motor limitations and to enhance competitive functionality (Wilson and Vine, 2017). Therefore, promoting and supporting sports for the disabled is not merely a humanitarian gesture but a reflection of a progressive and equitable society—one that acknowledges and leverages the potential of every individual, regardless of physical or cognitive differences.

MATERIALS AND METHODS

Choosing an experimental design is essential in every experimental research. It is a procedure that provides the researcher with the means to reach the desired results. Therefore, the researcher uses the experimental design called "*pre-post experiment on an experimental group and a control group*". (Al-Shafi'i and Morsi,1999).

Participants

The research sample is intentionally selected from the Nineveh Sub-Paralympic Committee players for deaf football, numbering (20) players, who represent (13.8%) of the research community. The sample has been divided into two groups (experimental and control) randomly using (lottery), with (10) players for each group. Homogeneity has been achieved for the research sample in the variables (age, height, mass, training age), and all selected visual abilities, using (Levene's Test), and Table 1 shows this.

Table 1. Values of Levene's and significance tests in the anthropometric measurements and visual abilities of the two research groups.

No	Variables	Unit of Measurement	L-T	Sig
1	Length	Cm	1.141	.300
2	Age	Years	0.230	.637
3	Training Age	Years	0.527	.477
4	Mass	Kg	3.505	.078
5	Visual Tracking	Score	0.330	.573
6	Peripheral Vision	Score	0.563	.463

It is clear from Table 1 that the significative values of the (Levene's) test for the research variables approached between (0.078-0.637) and are greater than the significance level (.05), which indicates the homogeneity of the research sample.

Equivalence has been achieved between the experimental and control research groups in the selected visual abilities, as shown in Table 2.

Table 2. The arithmetic means, standard deviations, calculated t values, and significative values for the equivalence of visual abilities between the two research groups.

No	Variables	Experimental group		Control group		t-value	Sig
		Mean	Deviation	Mean	Deviation		
1	Visual Tracking	6.300	1.494	6.700	1.337	- 0.631	.536
2	Peripheral Vision	5.500	1.354	6.300	1.059	- 1.472	.158

It is clear from Table 2 that the calculated (t) values are limited to ([1.472-]-[0.631-]) and by noting the significative values, which are limited to (0.158 - 0.536), all of them are greater than the significance level (.05), which indicates the absence of significant differences between the two research groups in visual abilities in the game of football for the deaf.

Visual abilities tests

In order to determine the tests for the research variables under study, represented by (visual tracking, peripheral vision), the researchers analyze the content of scientific sources and then presents the tests to a number of experts in the field of motor learning, measurement and evaluation and a number of soccer experts. The tests that obtained an agreement rate of (75%) has been approved, as (Bloom et al.) indicate

 © 2025 ARD Asociación Española

that "*the researcher must obtain an agreement rate of (75%) or more from the opinions of the arbitrators*" (Bloom et al., 1983). The visual tracking test has also been adopted, with the subject standing 3 meters behind a wooden wall, facing the ball. A colleague rolls the ball 5 meters from the top of the wooden wall toward the subject, ensuring the ball passes over the wall. The subject determines the color of the sticker placed on the ball before it crosses the 3 meters, as there are five different colors for the ball. Scoring: Each subject is given ten attempts. A score of 1 is awarded for determining only the color of the sticker. The minimum score is 0 and the maximum score is 10 in the test. Figure 1 illustrates the visual tracking test.

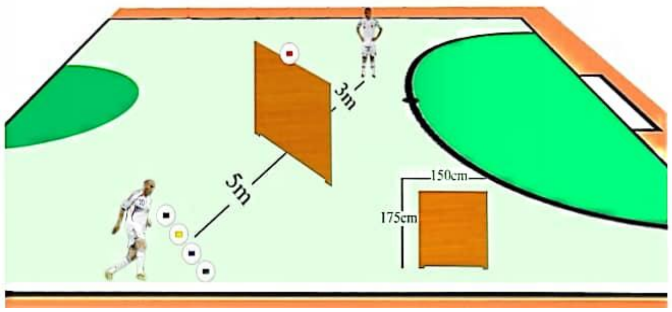

Figure 1. Visual tracking test.

For the peripheral vision test, the teacher and the subject standing in front of them continuously pass a ball over a distance of 8 meters. Fellow students standing 4 meters behind the subject make continuous passes with balls of different colors, with the distance between each student being 20 meters. The teacher gives instructions to the student standing in front of them to identify the color of the ball being passed between the students standing behind the subject. Scoring method: Each student is given ten attempts. A score of one is awarded for identifying the correct color only. The minimum score is zero and the maximum score is 10 in the test. (Al-Mutawaki, 2018), Figure 2 shows a peripheral vision test.

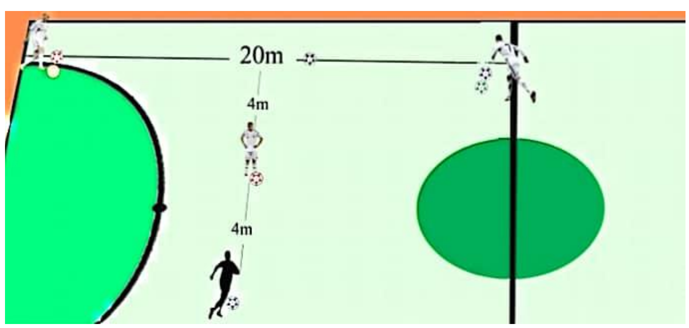

Figure 2. A peripheral vision test.

Training methods

The repetitive training method has been used in implementing the schematic visual scanning exercises. The schematic visual scanning exercises are applied in the main section of each training unit, specifically in the schematic aspect. The implementation of the schematic visual scanning exercises takes (8) weeks, with two intermediate cycles, and each intermediate cycle contains (4) minor cycles (weeks). Each minor cycle contains (3) training units per week, thus the total number of training units is (24) training units. The load movement oscillates in each intermediate cycle (1:3). The training units are conducted on (Sunday, Tuesday, Thursday) of each week at the Al-Mustaqbal Al-Mashreq Sports Club field.

The intensity (competitive intensity) of the visual scanning exercises was used. Positive rest has been used between repetitions and exercises. The number of repetitions is determined based on theoretical frameworks, as well as pilot experiments. The rest periods between repetitions, between sets, and between exercises are determined based on theoretical frameworks, as well as pilot experiments, by resting the heart rate to (100-110 bpm) between repetitions and (90 bpm) between sets and exercises. A Viatom-Checkme O_2 wristwatch and a pulse oxmeter are used to measure heart rate between repetitions, sets, and exercises. The exercise areas used in the research are determined inside the stadium according to what is indicated by (Labsy et al, 2014) and (Clemente, 2016) in a way that is consistent with the tactical situations according to the studies (Sporis et al, 2009), (Clemente, 2016) and (Hill-Haas et al, 2011). Both the size and the rest periods are fixed, and the change in the difficulty of performance was through reducing the specific areas if the largest area is used according to the number of players and then reducing these areas to increase the difficulty of performance (intensity) according to what has been indicated by both (Clemente, 2016, 86) and (Owen, et al, 2012, 51) as follows:

Table 3. The field sizes (width x length) (meters) used for the visual planning scanning exercises (Clemente, 2016, 86) and (Owen, et al, 2012, 51).

Stadium size	**1 VS 1**	**2 VS 2**	**3 VS 3**	**4 VS 4**	**5 VS 5**	**6 VS 6**
Small	5 VS 10	10 VS 15	15 VS 20	20 VS 25	25 VS 30	30 VS 35
Middle	10 VS 15	15 VS 20	20 VS 25	25 VS 30	30 VS 35	35 VS 40
Large	15 VS 20	20 VS 25	25 VS 30	30 VS 35	35 VS 40	40 VS 45

The researchers designed a number of exercises used to develop visual abilities. These exercises were applied to the experimental group and are withheld from the control group, as the control group used regular exercises designed by the trainer. The researchers are able to design 9 exercises for schematic visual scanning. Figure 3 show examples of one of the schematic visual scanning exercises that were designed. The objective of this exercise is to develop tactical visual scanning. A number of tools are used, such as footballs, colored jerseys, colored flags, and colored goals. The playing area and its dimensions: the attacking zone (30m x 35m). How to perform the exercise: Play (5x3) with (2) balls in the designated area. The team in possession of the balls consists of five players within the designated area, each with (2) balls. The team in possession of the balls takes possession during the specified time of the exercise. During the exercise, the players visually scan their teammates within the designated area and the coach to ensure the correct transfer of the ball. During the exercise, the coach raises one of the colored flags at the appropriate moment of his choice, allowing the team in possession to score on the goal according to the color specified by the coach. The exercise continues, with the positions being changed with each repetition. Each correct goal is awarded a point to the team. Two balls are used during each exercise.

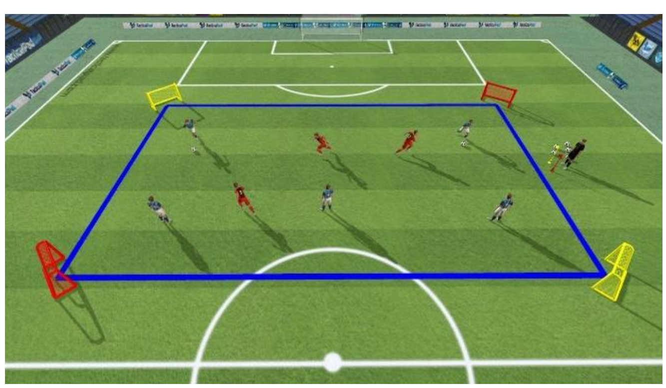

Figure 3. Examples of one of the schematic visual scanning exercises that were designed.

 © 2025 ARD Asociación Española

Figure 4 shows another visual development exercise, designed earlier. It differs from the previous exercise in terms of the playing area and zone. Equipment used: footballs, colored shirts, colored flags, colored rings. Playing area: center zone (30m x 35m). Method of exercise: Play (4x4+3) in the designated zone. The team in possession of the ball consists of four players inside the designated zone and three support players. The team in possession receives the ball during the allotted time of the exercise. During the exercise, the players visually check their teammates inside the designated zone, the support players, and the coach to ensure correct passing of the ball. During the exercise, the coach raises one of the colored flags at the appropriate moment of their choice, allowing the player in possession of the ball to pass it into the designated zone according to the color assigned by the coach. At the same time, the players visually check the coach to move to the zone to which the ball is being passed. The exercise continues, changing positions with each repetition.

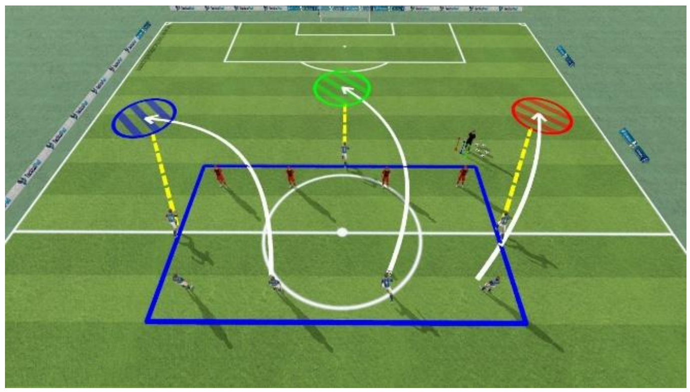

Figure 4. Examples of one of the schematic visual scanning exercises that were designed.

Statistical analysis

Statistical methods have been extracted using the SPSS statistical package, which included:

- Percentage.
- Arithmetic mean.
- Standard deviation.
- Shapiro test for normal distribution.
- Levene's test for homogeneity.
- t-test for independent samples.
- t-test for related samples.
- Eta squared test to determine the effect size for independent samples.
- Cohen's d test to determine the effect size for related samples.

RESULTS

Table 4. Arithmetic means, standard deviations, calculated t values, significance, and effect size (Cohen's d) for the pre- and post-tests of visual abilities for the experimental group.

No	Statistical parameters variables	Unit of measure	Pre-test		Post-test		(T) calculated	Sig.	Effect size	Std
			Mean	Deviation	Mean	Deviation				
1	Visual Tracking	Score	6.300	1.494	9.400	0.843	-5.670	.000	1.79	Large
2	Peripheral Vision	Score	5.500	1.354	9.100	0.737	-6.409	.000	2.02	Large

Table 4 shows that there are significant differences between the averages of the pre- and post-tests in the visual ability tests for the experimental group, as the significative values reached (.000/.000), respectively, which is smaller than the significance level (.05), and the value of the effect size (Cohen's d) was (1.79/2.02), respectively, indicating a large effect size in favor of the post-test.

Table 5. Arithmetic means, standard deviations, calculated t values, significance, and effect size (Cohen's d) for the pre- and post-visual ability tests for the control group.

No	Statistical parameters variables	Unit of measure	Pre-test		Post-test		(T) calculated	Sig.	Effect Ssze	Std
			Mean	Deviation	Mean	Deviation				
1	Visual Tracking	Score	6.700	1.337	8.400	0.699	- 4.295	.002	1.35	Large
2	Peripheral Vision	Score	6.300	1.059	8.000	1.247	- 3.285	.009	1.03	Large

Table 5 shows that there are important differences between the averages of the pre- and post-tests in the following visual ability tests (visual tracking, peripheral vision) for the control group. The significative values reached (.002/.009), respectively, which are smaller than the significance level (.05). The effect size value (Cohen's d) is (1.35/1.03), respectively, indicating a large effect size in favor of the post-test.

Table 6. Arithmetic means, standard deviations, calculated t values, significance, and effect size (Eta squared) for the post-tests of visual abilities for the experimental and control groups.

No	Statistical parameters variables	Unit of measure	Experimental group		Control group		(T) calculated	Sig.	Effect size	Std
			Mean	Deviation	Mean	Deviation				
1	Visual Tracking	Score	9.400	0.843	8.400	0.699	2.887	.010	0.316	Large
2	Peripheral Vision	Score	9.100	0.737	8.000	1.247	2.400	.027	0.242	Large

Table 6 shows that there are outstanding differences between the averages of the two post-tests in the visual ability tests for the experimental and control groups. The significative values are (.010/.007), respectively, all of which were smaller than the significance level (.05). The effect size values (Eta squared) are (0.316/0.340), respectively, indicating a large effect size in favor of the experimental group.

DISCUSSION

The researchers attribute the development in the results of visual abilities in Tables (4)(5)(6), which indicates the development of the experimental group players in visual abilities, as well as the superiority of the experimental group players over the control group players in all visual abilities, to the effective positive effects of the tactical visual scanning exercises. The researchers attribute the development in peripheral vision to the tactical visual scanning exercises, as the results that appeared for peripheral vision in the pre- and post-test of the experimental group indicate the presence of significant differences, indicating a significant improvement that can be explained by the ability of the tactical visual scanning exercises to improve peripheral vision in deaf soccer players, who are in dire need of this visual ability due to the absence of their sense of hearing. This is consistent with what (Al-Zamli) indicated, that there is a direct relationship between offensive and defensive abilities and sports visual vision.

The researcher attributes the reason for this to the fact that this skill (peripheral vision) is used when the player is in influential positions that contribute to uncovering the field and creating gaps in the opponent's defense. The correct vision of the playmaker player is the real key to team play, as it enables the attacking team to continue the control of the largest possible area of the field, the team also enables it to optimally

 © 2025 ARD Asociación Española

exploit gaps in the opposing defense. Long passes are often used for escaping attacking players, often behind defenders. Given the significant developments in modern football, the team with the best and fastest ability to spread out is the most dangerous to the opposing team's goal (Al-Zamli, 2012). Donald & Caroline assert that vision is the primary sense used to obtain information from our environment, and that it is important for distinguishing between sight and sports-related vision. Visual training provides the brain with information from other senses (the corresponding internal senses) and improves the body's motor systems (neuromuscular) for output (response) (Donald & Caroline, 1995). Fleh's study demonstrates the importance of peripheral vision exercises as effective tools for developing the visual abilities of deaf football players and enhancing their peripheral vision. This training revolves around creating training situations that simulate match conditions, in which players are exposed to multifaceted visual stimuli, increasing their awareness of the positions of teammates, opponents, and the empty spaces around them.

The use of these methods has been shown to improve the spatial perception and expand the peripheral vision, which positively impacts the team's tactical performance by enhancing the speed of reading the scene and making decisions. The study also confirms that these exercises provide an effective solution to compensate for the deficient visual sense resulting from hearing impairment, helping deaf players acquire visual tactics that are reflected in their better ball control and movement on the field (Fleh, 2021). The researchers attribute the development in visual tracking to the tactical visual scanning exercises, as these exercises included tracking the ball's movements and the color of the flag raised by the coach so that the player could choose the target that matches the color of the raised flag. The results that appeared for visual tracking in the pre- and post-test for the experimental group indicate the presence of impressive differences in favor of the post-test, in addition to the superiority of the players of the experimental group that used the tactical visual scanning exercises over the players of the control group in the post-tests in visual tracking. This is consistent with (Al-Zamli), that the process of tracking the ball for the defender or the attacker is a necessary matter, and that the limited level of vision will lead the players to make incorrect decisions capable of creating surprising positive circumstances. It is also characterized by the classic form, which distinguishes it by being exposed to the opponent and free of surprise. (Al-Zamli, 2012).

The researchers also believe that structured visual training contributes effectively to improving the visual tracking skills of deaf soccer players, which enhances their ability to follow the ball, interact with it, and assess the positions of the players around them, despite limited hearing. This is confirmed by a study that included an age group (12–14 years). The researchers used an experimental model that included an experimental and control sample, during which they applied specialized visual exercises – including visual scanning and tracking in training situations that simulated a competitive context. This shows a primordial improvement in the experimental group compared to the control group, as it shows an obvious improvement in the accuracy and speed of visual tracking – and this is attributed to the scanning exercises that forced the players to follow the ball and the movement of the players using visual filing (Ben Zidane, et, al, 2020).

The experiences of researchers in this field confirm the existence of a close relationship between the level of comprehensive vision and technical and tactical ability. A large percentage of players who possess a broad and comprehensive vision are those who possess field intelligence and high technical ability. Furthermore, the type of game has an impact on the level and breadth of vision. Experiments conducted in the former Soviet Union confirm that football, basketball, handball, boxing, wrestling, and weightlifting players possess a high level of comprehensive vision (Jaber et al., 1991).

The characteristics of fatigue and the variables present require developing the lateral vision of players, especially since there are kinetic variables occurring within a single moment. They also require developing the level of ball tracking, the depth of vision, and the required shape. Therefore, when the ball is at or below eye level, directing the ball toward the goal and scoring a goal will not be as intended. This indicates the addition of attributes to attackers from the moment the attacker receives the ball and handles it on the field through several stages, including:

1- Knowledge of the ball's flight and the accuracy of its arrival.
2- The best way for a player to receive the ball. (Al-Zamli, 2012).

CONCLUSIONS AND RECOMMENDATIONS

In light of the results obtained, the researchers reach the following conclusions:

- The visual scanning exercises implemented by the experimental group resulted in positive development in all visual abilities.
- The curriculum prepared by the trainer and implemented by the control group resulted in positive development in all visual abilities.
- The experimental group, which used the visual scanning exercises, outperformed the control group in all visual abilities.

After examining the findings, the researchers make the following set of recommendations:

- The need to emphasize the tactical visual scanning exercises by deaf football coaches, given the research results' positive improvement in the visual abilities of deaf football players.
- Emphasis should be placed on using the repetitive training method in tactical visual scanning exercises, as this allows the coach to better control the components of the training load.
- The possibility of conducting similar research on other age groups and genders in deaf football, as well as conducting similar studies on other team sports.

AUTHOR CONTRIBUTIONS

Yonis initiated the idea, supervised the research, and evaluated and edited the research paper. Basher wrote the first draft, documented the training methods, and Yonis provided the training materials and assisted Basher in analysing the results. The authors contributed to drafting the final manuscript and discussing the findings.

SUPPORTING AGENCIES

No funding agencies were reported by the authors.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

REFERENCES

Al-Mutawaki, A. (2018). The effect of proposed exercises in developing the most important visual and cognitive abilities among players of the Al-Qadisiyah University futsal team, unpublished master's thesis, College of Physical Education and Sports Sciences, Al-Qadisiyah University, Iraq.
Al-Shafei, H. (1999). Principles of Scientific Research in Physical Education and Sports, Maaref Foundation, Alexandria, Egypt.

 © 2025 ARD Asociación Española

Al-Zamili, A. (2012). Some visual abilities and their relationship to the performance of some offensive and defensive skills among players of the Al-Qadisiyah University team in five-a-side football, Al-Qadisiyah Journal of Sports Education Sciences, 12(1), 198-202.

Bailey, R. (2006), Physical Education and Sport in Schools: A Review of Benefits and Outcomes. Journal of School Health, 76: 397-401. https://doi.org/10.1111/j.1746-1561.2006.00132.x

Ben Zidane, H., Mokrani, J., Ben Berno, O. (2020). The effectiveness of using visual training to improve and master some football skills for deaf people (12-14 years old). Journal of Sports Creativity, 11(2), 244-263.

Block, M. E., & Obrusnikova, I. (2007). Inclusion in Physical Education: A Review of the Literature from 1995-2005. Adapted Physical Activity Quarterly, 24(2), 103-124. Retrieved Aug 18, 2025, from https://doi.org/10.1123/apaq.24.2.103

Bloom, B. et al. (1983). Assessment of Student Learning: Summative and Evaluative, Translated: Muhammad Amin Al-Mufti et al., McCormick House, Cairo, Egypt.

Clemente, F. M. (2016). Small-Sided and Conditioned Games in Soccer Training, Instituto Politécnico de Viana do Castelo, Escola Superior de Desporto e Lazer, Melgaço, Portugal.

DePauw, K.P. , & Gavron, S.J. (2005). Disability Sport. Champaign, IL: Human Kinetics. Retrieved August 18, 2025, from http://dx.doi.org/10.5040/9781492596226

Donald F.C. & Caroline J. M. (1995). Sports Vision", 1st.

Fleh, A. H. (2021). The use of conditional competition exercises to develop visual vision skills and its impact on mental abilities and basic football skills for deaf and dumb. Journal of Sports, 6(2), 223-228.

Hill-Haas, S. V. & Dawson, B. & Impellizzeri, F. M. & Coutts, A. J.(2011). Physiology of Small-Sided Games Training in Football, A Systematic Review, School of Sports Science, Exercise & Health, University of Western Australia, Perth, Western Australia, Australia. https://doi.org/10.2165/11539740-000000000-00000

Jabr, S. R. et al (1991). Football for the third grades, Dar Al-Hikma for Printing, Mosul.

Jordet, G. (2020). Perceptual-cognitive skills and their interaction in football, International Journal of Sports Science & Coaching, 15(3), 291-298.

Labsy, Z. & Tourny, C. & Gallice, J. & Ahmaïdi, S. (2014). Jeux à effectifs réduits et préparation physique intégrée, Département Éducation et Développement technique de la FIFA, Zurich, Suisse.

McGuckian, T. B., Cole, M. H., Chalkley, D., Jordet, G., & Pepping, G. J. (2018). Visual exploratory activity and resultant behavioural analysis of youth midfielders during 11v11 match-play, Journal of Sports Sciences, 36(22), 2597-2603.

McGuckian, T. B., Cole, M. H., & Pepping, G. J. (2017). A systematic review of the technology-based assessment of visual perception and exploration behaviour in association football. Journal of Sports Sciences, 36(8), 861–880. https://doi.org/10.1080/02640414.2017.1344780

Owen, Adam & Twist, C. & For, P. (2012). Small-Sided Games: The Physiological And Technical Effect of Altering Pitch Size and Player Numbers.

Sporis, G., Jukic, I., Ostojic, S. M., & Milanovic, D. (2009). Fitness Profiling in Soccer: Physical and Physiologic Characteristics of Elite Players. The Journal of Strength & Conditioning Research, 23(7). https://doi.org/10.1519/JSC.0b013e3181b3e141

Wilson, M. R., & Vine, L. (2017). Visual attention in sport: Concepts and applications, Current Opinion in Psychology, 16, 1-5. https://doi.org/10.1016/j.copsyc.2017.03.008

Winnick, M. C. & Porretta, D. L. (2016). Adapted Physical Education and Sport, 6th ed., Human Kinetics.

This work is licensed under a Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0 DEED).