



INVESTIGATION OF THE EFFECT OF VIDEO-ASSISTED MENTAL TRAINING ON THE TECHNICAL DEVELOPMENT OF MALE FOOTBALL PLAYERS IN THE 12-14 AGE GROUP

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Abstract:

This study aimed to examine the effect of video-supported mental training on the technical development of male football players in the 12-14 age group. 24 male athletes aged 12-14 participated in the study voluntarily. Volunteers were divided into a physical training group (FG, n:12) and a physical training and mental training group (FZG, n:12). Volunteers are given 4 weeks and 3 days a week; FG, physical football training only; FZG, on the other hand, participated in mental training programs before each physical training. Mor-Christian Test Station was used for shooting, passing and dribbling ability test measurements and measurements were taken twice, on the first day (T1) and the last day (T2) of the 4-week training period. The data obtained was analyzed using the SPSS 22.00 statistical program. In the study, significance was obtained at the $p<0.05$ level between FG, T1 and T2 measurements and at the $p<0.05$ level between FZG, T1 and T2 measurements. As a result of the statistics performed between the groups, a significance level of $p<0.05$ was obtained between the results of the FZG group and FG. As a result, it is thought that video-supported mental training will make significant contributions to the development of basic technical skills of young football players. It is thought that applying mental training together with physical training may be effective in achieving the highest efficiency in athletes. Therefore, considering the benefits of mental training and its effects on performance, it can be recommended that mental training be applied together with physical training in training planning.

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1. Introduction

Football is one of the most popular sports in the world, and it is followed by great interest. Success in football, especially, can be achieved by developing fundamental techniques at the grassroots level. The rapid and effective improvement of fundamental technical skills in football can provide athletes with significant advantages in the long run (Srebro, 2003).

The ages of 12 to 14 are a critical period for the development of young football players' technical and tactical skills. During this time, focusing on players' technical abilities, game knowledge, and mental resilience is among the determining factors for their future success (Lemyre *et al.*, 2006).

In football, various techniques are used to develop skills such as passing, shooting, ball control, and dribbling. Among these techniques, the practice technique, demonstration and execution technique, and self-learning technique are some of the most popular ones (Hegazy, 2012).

In addition to traditional training methods, innovations provided by technology in the field of sports are being integrated into athletes' development processes and offering different approaches. In recent years, studies have been conducted on how mental training can contribute to athletes' technical development. Video-assisted mental training is an effective method used to improve athletes' performance. This method provides players with feedback about game situations and visually analyses technical skills and developmental strategies (Renshaw *et al.*, 2010).

The use of visual materials, especially in the learning processes of young athletes, increases their attention and reinforces their motivation to learn (Williams & Ford, 2008).

When the literature is examined, there are many definitions explaining the concept of mental training applied to enhance an athlete's performance; mental training refers to the development of a specific movement using only imagination, without physically executing it (Hecker & Kaczor, 1988).

It is the process by which an athlete engages in mental preparation alone in order to achieve a targeted performance before executing a physical movement (Yalçın, 2022). The human body is a complex system where emotions, thoughts, and movements create a whole. In the life of sports, an individual's mental thoughts and mood are directly related to their performance. The athlete's emotional state and the preparation process for the competition are critical for achieving the desired performance (Konter, 2016). Mental training is implemented to help athletes cope more effectively with the challenges they face in training and competitions (Vealey, 2007).

In general, mental training helps athletes complete their training processes and improve their performance while also contributing to the positive modification of negative behaviors that hinder high performance. Additionally, it provides regular practices for identifying issues such as anxiety, lack of concentration, and pressure that athletes face, as well as methods for coping with these problems (Syer & Connolly, 1998).

Developments in the competitive environment have shown that athletes' physical abilities alone are insufficient. This situation has led athletes and coaches to understand the importance of sports psychology better. Mental training, which is part of psychological studies, plays a critical role in various areas, such as enhancing athletes' performance, managing stress and anxiety, providing motivation, recovering from injuries, and preparing for competitions (Ekmekçi, 2017).

Studies examining the effects of mental training on performance vary in terms of the variables and methods used. Some research addresses the impact of mental training in conjunction with other factors such as sport, gender, nutrition, and mental factors. In contrast, others focus solely on the effect of mental training on performance. It has been concluded that after the application of cognitive and other psychological methods, such as imagery, performance levels increase; however, these methods yield more effective results when combined with physical training (Jones & Stuth, 1997).

Elite athletes may encounter various issues in their personal lives outside of competitions. This situation can negatively affect their athletic performance. Therefore, it is important for athletes to work with professional mental training coaches and to allocate time for mental training in addition to physical training in order to strengthen themselves psychologically (Ekmekçi, 2017).

This process essentially involves the conceptualization and development of physical skills in mental domains. Athletes participate in mental rehearsals, where they vividly visualize themselves performing specific physical abilities. This strengthens the neural pathways associated with motor skills and enhances their capacity to perform at their best in real-life conditions (Schling & Gubelman, 1995).

Mental training is an important tool in psychology, particularly in applied sports psychology, to support the emotional, mental, and behavioral development of athletes. Such training plays a critical role in enhancing athletes' performance. Research shows the positive effects of mental training on performance; however, expecting immediate results during this process can be misleading. It is also a fact that the best results are obtained when mental training is applied alongside physical training. Considering the individual differences among athletes, it is important to identify the necessary methods in advance. Furthermore, the continuity and habitual incorporation of mental training lead to more effective results in the long term. Mental training is beneficial not only during competition periods but also during injury recovery and preparation phases. Especially during injury periods, it is crucial to utilize this training method to improve athletes' psychological states and accelerate their recovery processes. It is also noteworthy that mental training can shorten the learning process for physical training, ensure the correct execution of movements, reduce the risk of injury, and help athletes control their emotional states (Altıntaş & Akalan, 2008).

Athletes need to develop their physical, mental, motor, and emotional skills in a balanced way to achieve high performance. Physical skills enhance strength and endurance, while mental skills include elements such as motivation, concentration, and stress management. Coaches should support athletes' development in these areas and

create individualized training plans. This way, athletes can better identify their strengths and weaknesses, leading to a more effective training process (Yamak, 2019).

The increase in the number of people interested in sports and physical exercise, along with the growth of sports facilities in our country, has made it essential for sports to become more accessible and functional. This contributes to leading a more efficient life and ensures that sports lessons conducted in schools and sports clubs are more effective. Additionally, for our country's athletes to achieve success in all areas of sports, the integration of technology into sports has become a necessity. In today's sports system, a comprehensive approach is required to discover and develop future talents. It is critically important to identify and support athletic potential using scientific methods from childhood. Under the guidance of expert coaches, the holistic assessment of physical and mental abilities will enable the training of competitive athletes to international standards. In this process, the strategic use of technology emerges as a key factor in enhancing the effectiveness of athlete development programs (Yücel and Devecioğlu, 2011).

Technology has always played an important role in skill training. Videos, as an element of technology, facilitate the development of individuals' skill abilities (Metel & Uysal, 2010).

The use of scientific videos as a pedagogical tool in educational processes is an important approach that enriches the learning experience. This method aims to enhance the effectiveness of education by integrating theoretical knowledge with practical applications. The integration of video content into learning environments has the potential to provide multiple benefits. From a cognitive perspective, it allows students to grasp topics more deeply, retain information better in their memories, and recall it more quickly. On a psychological level, it increases motivation towards the learning process and makes the educational experience more enjoyable. The use of visual materials contributes to the easier understanding of complex information. Through videos, students can develop critical thinking, interpretation, and problem-solving skills. This process transforms learning from a passive act into an active mental activity. Video-supported teaching methods positively affect students' academic performance and motivation. The integration of audiovisual materials into the educational process turns learning into an experience based more on exploration and understanding (Schwan & Riempp, 2004).

The role of visual elements in the learning process is quite significant. Research shows that visual perception is approximately 83% effective in people's learning capacity. Therefore, it is crucial for educators to appeal to multiple sensory organs and particularly to utilize visual materials when conveying information. Contemporary educational approaches provide teachers with a rich array of visual tools. Various materials such as videos and images enable more effective and lasting communication of knowledge. These tools facilitate the understanding of complex concepts and keep students' attention engaged. The Video-Supported Education model is a flexible approach that can respond to the needs of students with different learning styles. It can be equally beneficial for visual, auditory, and kinesthetic learners (Yavaş & İlhan, 1997).

2. Materials and Methods

2.1 Research Model

This section includes information about the research methodology, population and sample, statistical analysis of the data, and data collection methods. The study was initiated after receiving ethical committee approval with meeting number 05 dated 05.05.2023 (2023/05). Additionally, the necessary parental consents for the individuals participating in the research were obtained, and a form indicating their voluntary acceptance to participate in the study was signed. In this way, the study was conducted in accordance with ethical standards, meticulously planned and implemented to obtain reliable results.

This study is an experimental research conducted to examine the effect of video-supported mental training on the technical development of male football players aged 12-14, using quantitative research methods. The data obtained from the research group were analyzed in terms of the individual's personal characteristics and certain variables addressed in the study and presented in a report.

2.2 Data Collection Tools

To measure the passing, shooting, and dribbling skills of the football players, the Mor-Christian general football skills test was applied during the pre-test and post-test phases of the research.

2.2.1 Soccer Passing Test

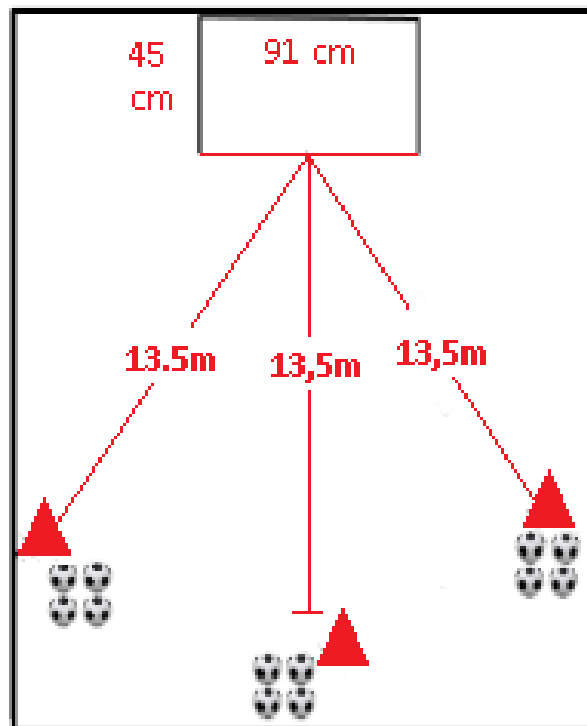


Figure 1: Mor Christian Soccer Passing Test

In the accurate passing test, a goal measuring 91 cm in width and 45 cm in height is used as the target. The test is conducted from three different points. These points are positioned 13.5 meters away from the goal line, with two cones forming a 45-degree angle with the goal line, while the third cone is positioned 13.5 meters away at a 90-degree angle to the goal line. Football players take four shots from each of the designated three points (a total of 12 passes) toward the goal using the ground and their preferred foot. Each successful pass earns 1 point, and balls that hit the goalposts are also counted as successful. The final score of the test is calculated as the total points from the 12 passes. Participants are allowed to practice at each point before the actual test (Strand & Wilson, 1993).

2.2.2 Soccer Shooting Test

In the shooting test aimed at measuring footballer performance, points are awarded based on the shots taken by the athletes. In this test, football players take shots at the goal from a distance of 14.5 meters using their preferred foot. The goal is equipped with four separate target circles, each with a diameter of 120 cm. Each player takes four shots at each target, resulting in a total of 16 shots. The scoring system is designed with precision. A shot that hits the desired target earns 10 points, while a shot that enters the adjacent lower or upper target earns 4 points. Shots that directly enter the designated target or the adjacent lower or upper targets are considered successful, while shots that do not hit the circles receive no points. The total score obtained from the 16 attempts is recorded as the final score (Strand & Wilson, 1993).

- 1) Shots aimed at the correct target: 10 points,
- 2) Shots aimed at adjacent targets: 4 points,
- 3) Shots aimed outside the target: 0 points.

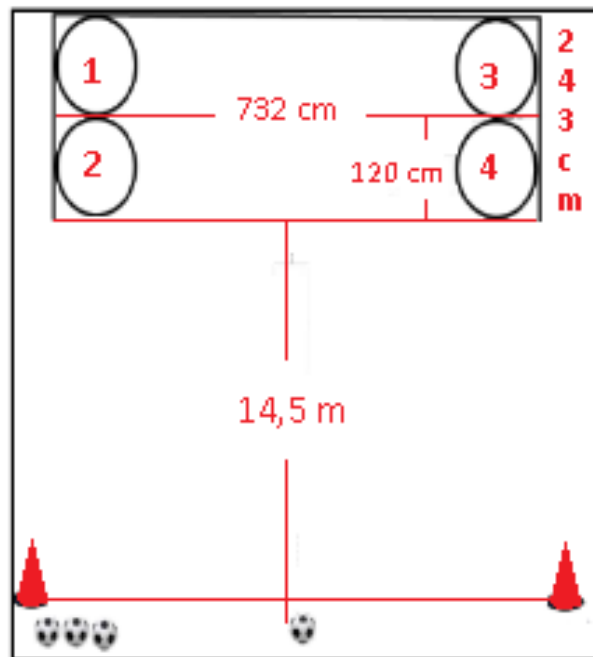


Figure 2: Mor Christian Soccer Shooting Test

2.2.3 Dribbling Test

This test, conducted in a circular area with a diameter of 18 meters, measures the dribbling skill of football players. Twelve cones, each 45 cm high, are placed at intervals of 4.5 meters within the test area. The starting line is positioned outside the circle. Upon the command "start," the player dribbles the ball through the cones and returns to the starting point. In addition to trials conducted in two different directions (clockwise and counterclockwise), one direction of the athlete's choice is also allowed, and measurements are taken. The average of the best two times is recorded as the test score (Strand & Wilson, 1993).

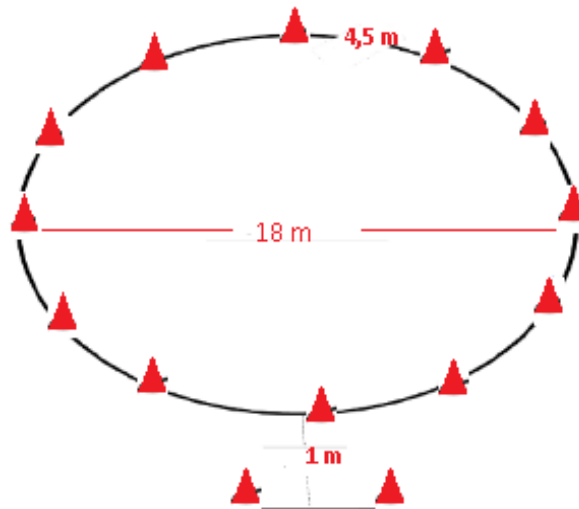


Figure 3: Mor Christian Soccer Dribbling Test

2.3 Analysis of Data

The data analysis was conducted using the SPSS 22.00 software. Normality tests were performed on the collected data, and it was observed that the Skewness-Kurtosis values were between -1.5 and +1.5, indicating that the data was normally distributed. Therefore, parametric tests were used. In addition to descriptive statistics, the Independent Sample T-test was employed to compare the pre-test and post-test differences between the experimental and control groups, while the Paired Sample T-test was used to compare the pre-test and post-test within the groups themselves. A 95% confidence interval was adopted for detecting significant differences.

3. Results

In this section, the findings obtained from the statistical analyses of the data collected in the study are presented in tabular form.

Table 4.1: Descriptive Parameters of the Experimental and Control Groups

	Group	N	Min.	Maks.	N	Ort.	S. S.
Age (kg)	Experimental Group	12	13	14	12	13,75	0,452
	Control Group	12	12	14	12	13,58	0,669
Height (cm)	Experimental Group	12	144	178	12	158,25	9,79
	Control Group	12	140	172	12	157,42	10,11
Body Weight (kg)	Experimental Group	12	38	55.80	12	46,78	5,39
	Control Group	12	37	67	12	46,70	8,16

Table 4.1 shows the frequency values of the participants in our study according to their age groups. Accordingly, our study consists of a total of 24 people, with 12 in the experimental group and 12 in the control group. When examining the descriptive parameters of the participants, the average height of the experimental group is 158.25 ± 9.79 cm, and the average weight is 46.78 ± 5.39 kg. The average height of the control group is 157.42 ± 10.11 cm, and the average weight is 46.70 ± 8.16 kg.

Table 4.2: Comparison of Pre-Test and Post-Test Results of the Experimental Group

		Ort.	N	SS.	t	p
Dribbling	Pre-test	16,84	12	0.48	3.27	0.007
	Post-test	16,70	12	0.49		
Shooting	Pre-test	42,00	12	13.53	-2.86	0.015
	Post-test	50,66	12	12.30		
Passing	Pre-test	6,91	12	0.99	-4.30	0.001
	Post-test	8,25	12	0.62		

Table 4.2 shows the Dribbling, Shooting, and Passing test results of the experimental group that participated in our study. The pre-test average for dribbling in the experimental group was $16.84 \pm .48$, and the post-test average was $16.70 \pm .49$. The pre-test average for shooting was 42.00 ± 13.53 , and the post-test average was 50.66 ± 12.30 . The pre-test average for passing was $6.91 \pm .99$, and the post-test average was $8.25 \pm .62$. As a result of the analyses conducted, it can be seen in Table 4.2 that there is a statistically significant improvement ($p < 0.05$) in the results between the pre-test and post-test for dribbling, shooting, and passing in the experimental group.

Table 4.3: Comparison of Pre-Test and Post-Test Results of the Control Group

		Ort.	N	SS	t	p
Dribbling	Pre-test	16,87	12	0.75	-2.028	0.067
	Post-test	17,00	12	0.75		
Shooting	Pre-test	45,66	12	10.47	-2.569	0.026
	Post-test	51,66	12	11.46		
Passing	Pre-test	7,91	12	1.16	-1.332	0.210
	Post-test	8,33	12	1.30		

Table 4.3 shows the Dribbling, Shooting, and Passing test results of the control group that participated in our study. The pre-test average for dribbling in the control group was

16.87±.75, and the post-test average was 17.00±.75. The pre-test average for shooting was 45.66±10.47, and the post-test average was 51.66±11.46. The pre-test average for passing was 7.91±1.16, and the post-test average was 8.33±1.30. As a result of the analyses conducted, it can be seen in Table 4.3 that there is a statistically significant improvement ($p<0.05$) in the results between the pre-test and post-test for shooting and passing in the control group, whereas no significant difference was found in the dribbling test results.

Table 4.4: Comparison of Pre-Test Post-Test Differences of Experimental and Control Groups

	Group	N	Ort.	SS	t	p
Dribbling	Experimental Group	12	0.14	0.14	3.542	0.002
	Control Group	12	-0.12	0.21		
Shooting	Experimental Group	12	8.66	10.49	.697	0.493
	Control Group	12	6.00	8.09		
Passing	Experimental Group	12	1.33	1.07	2.082	0.049
	Control Group	12	0.41	1.08		

When examining Table 4.4, which shows the pre-test and post-test differences of the experimental and control groups, a significant difference ($p<0.05$) was found in the results of the dribbling and passing tests, while no significant difference was found in the shooting test results.

4. Discussion and Conclusion

When examining the descriptive parameters of the experimental and control groups, the frequency values according to the age groups of the participants in our study are shown. Accordingly, our study consists of a total of 24 individuals, with 12 in the experimental group and 12 in the control group.

When examining the descriptive parameters of the participants, the average height of the experimental group was found to be 158.25±9.79 cm, with an average weight of 46.78±5.39 kg. The control group had an average height of 157.42±10.11 cm and an average weight of 46.70±8.16 kg.

When comparing the pre-test and post-test results of the experimental group, the analyses show that there is a statistically significant improvement ($p<0.05$) in the results between the pre-test and post-test for dribbling, shooting, and passing in the experimental group.

4.1 Comparison of Pre-Test and Post-Test Differences Between Experimental and Control Groups

When examining the pre-test and post-test differences of the experimental and control groups, significant differences ($p<0.05$) were found in the results of the dribbling test and passing test, while no significant difference was detected in the shooting test results.

The most common application of mental training is the development of sports skills. Skills can be enhanced through positive visualization, and by addressing the

weaknesses in these skills, they can be executed more successfully and effectively. Mental training is a psychological skill that possesses significant potential to enhance an athlete's performance (Konter, 1999).

The study conducted by Özdal *et al.* (2013) demonstrates that video-supported mental training positively influences shooting skills in football. This research reveals that when mental training is applied in conjunction with physical training, it is more effective than the application of either physical or mental training alone. Therefore, it is recommended that mental training be integrated into physical training periods when preparing annual training programs. Written texts, videos, and audio recordings used for mental training play a significant role in enhancing athletes' performance (Özdal *et al.*, 2013).

Kulak's (2020) doctoral thesis titled "Examining the Effects of Imagery and Self-Talk Techniques on Shooting Performance in Amateur Football Players" shares positive similarities with our study. Imagery and self-talk methods enhance athletes' performance in a positive manner and prepare them to cope with adverse situations, making them more prepared and balanced. Therefore, integrating mental training into physical training programs is of great importance, as athletes who are not mentally prepared may experience a decline in their physical performance (Kulak, 2020).

In his research, Sosovec (2004) examined the effects of visual imagery on football penalty kicks. The subjects in this study were divided into three groups: those practising mental training, those practising physical training, and those who applied both types of training together. The results of the research indicated that the group engaging in both physical and mental training achieved a higher number of accurate shots compared to the other groups. This finding demonstrates the positive impact of combined training methods on performance (Sosovec, 2004).

In the study conducted by Baikoğlu and Kandemir (2020), it was observed that 14 female volleyball players who voluntarily participated were included in a physical training program three days a week. The study was conducted over a period of six weeks, during which video-supported mental training was implemented following physical training sessions. Upon analyzing the measurements related to the athletes' horizontal jump performance, a statistically significant difference was found between the jump values obtained prior to the imagery session and the second horizontal jump values obtained after a three-week physical training period followed by imagery training that included correct techniques shown in videos. These findings highlight the performance-enhancing effect of video-supported mental training (Baikoğlu and Kandemir, 2020).

In the six-week study conducted by Olsson *et al.* (2008) on high jump athletes, the experimental group participated in a mental imagery program totalling 72 hours in addition to their regular training. The results of the research were examined in terms of variables such as jump height, failed jumps, jump angle, and bar clearance distance. A comparison between the two groups revealed a significant difference in favor of the experimental group only regarding bar clearance distance. These findings suggest that

mental training can assist in enhancing the components of sports skills, supporting our study (Olsson C. *et al.*, 2008).

In Jordet's (2009) study titled "Perceptual Training in Football and Image Intervention in Elite Football Players," the importance of using imagery to enhance the productivity of elite football players during activities and in setting future goals is emphasized. The findings of the research indicate that the use of imagery positively affects performance. These results serve as a valuable resource that supports our study as well (Jordet, 2009).

In the study conducted by Botwina and Krawczynski (2003), the effect of mental training on football penalty kick performance was examined. A total of 21 football players voluntarily participated in the research, which involved dividing the participants into three groups. One group engaged solely in physical training, while another group underwent both physical and mental training, and the third group participated only in physical training. All groups took part in 37 video-watching activities related to the World Cup. The mental training group was also encouraged to visualize their penalty kicks continuously during training, and additional mental training support was received. Although no significant difference was found among the participants in terms of physical and skill levels, it was concluded that the group applying mental training alongside physical training achieved higher scores. This finding serves as important evidence supporting the performance-enhancing effects of mental training (Botwina *et al.*, 2003).

In the study conducted by Altıntaş and Akalan (2008), the effects of mental training methods applied alongside physical training on the technical skill performance of beginner football players aged 10-12 were examined. The results of the research demonstrate that the experimental group, which underwent both physical and mental training, made progress in terms of dynamic balance, flexibility, and speed. In contrast, the control group that engaged solely in physical training showed a decline in dynamic balance skills and did not achieve significant improvements in flexibility and speed. These findings indicate that when mental training is combined with physical training, it can play an important role in enhancing the technical skills of young football players (Altıntaş & Akalan, 2008).

In Stewart's (2006) study conducted on beginner figure skaters aged 7-10, the control group participated solely in physical training, while the experimental group underwent physical training in addition to mental training and video-watching methods. The results of the study indicated that the combined use of mental training and video watching was significantly more effective than traditional physical training methods. These findings demonstrate that mental and visual supports contribute significantly to the performance development of young athletes (Stewart, 2006).

Fallby's (2003) study shows that Olympic athletes who engage in systematic mental skills training experience positive improvements in their performance. Such training plays a significant role in enhancing athletes' moods and developing their goal-setting abilities. Therefore, the findings from this study parallel our research, highlighting that systematic mental training is an essential component for athletes (Fallby, 2003).

The study conducted by Thiese and Huddleston (1999) reveals that athletes who engage in mental preparation perform better than their counterparts. This finding provides significant additional evidence supporting the impact of mental training. Concluding that mental preparation contributes to the development of athletes indicates the need for further research and application in this area (Thiese & Huddleston, 1999).

In conclusion, it is believed that video-supported mental training will significantly contribute to the development of fundamental technical skills in young football players. The combination of mental training with physical training is thought to be effective in achieving optimal performance in athletes. Therefore, considering the benefits of mental training and its effects on performance, it is advisable to incorporate mental training alongside physical training in training planning.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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