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The Role of Mental Imagery in Enhancing Skill Performance among Senior Volleyball Players: A Field Study of Selected Clubs in Laghouat Province

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Abstract:

This study aims to examine the impact of mental imagery on enhancing skill performance among senior volleyball players. Additionally, it aims to enhance the development of mental skills in conjunction with physical training by incorporating mental practice. To achieve these objectives, researchers employed a descriptive analytical method, as it is particularly well-suited to the nature of the research. The study sample consisted of 60 players randomly selected from various volleyball clubs in Laghouat Province. Moreover, based on a structured questionnaire was used to collect the data. Lastly, the findings indicate that mental imagery plays a significant and positive role in improving the skill performance of the players. Ultimately, the study emphasizes the importance of incorporating mental imagery techniques into regular training programs to enhance overall athletic performance.

Keywords: mental imagery, skill performance, volleyball.

1. INTRODUCTION

Mental imagery is considered one of the most critical techniques that enable athletes to achieve motor and skill requirements effectively. It provides practical strategies to organize and enhance athletic performance efficiency. This is particularly relevant given that the physical and skill demands in volleyball have direct connections with the mental aspect. Mental imagery is among the mental skills that players must train. It involves cognitive rehearsal, where individuals imagine themselves performing a motor skill from either a first-person perspective (internal imagery) or a third-person perspective (external imagery).

Typically, mental imagery follows muscular and mental relaxation, representing one of the most commonly used cognitive techniques. It is a form of silent mental simulation employed by individuals both within and outside sport domains, either intentionally or unintentionally (Elnkaib, 1992).

Mental imagery relies on both external visualization, which involves recalling a mental image of a particular skilled player's performance through careful observation and scrutiny, and internal visualization, in which the athlete imagines themselves executing the performance. Both forms significantly contribute to enhancing skill performance, which entails a specialized system of simultaneous and sequential motor actions. This system effectively organizes the interplay between internal and external forces impacting the athlete, thereby enabling full and efficient utilization to achieve optimal sporting outcomes. Skill performance also reflects athletes' levels and mastery of the skills incorporated in the game, representing the ideal model of technical execution and effective methods for accomplishing specific motor tasks (Al-Fateh & Al-Sayed, 2002).

Moreover, mental imagery of motor skills helps athletes understand the nature of skill execution, bringing them closer to performing correctly and successfully. It also enables athletes to mentally rehearse competitive scenarios mentally, thereby providing opportunities for strategic thinking to overcome opponents and make accurate decisions and responses at the right time and place (Ibrahim, 2014).

Accordingly, sports activities, including volleyball, depend heavily on fundamental skills as an essential foundation for progress. Consequently, coaches dedicate most of their training time to skill improvement, teaching, and decision-making. However, prolonged physical training is not the sole method for



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acquiring motor skills. Many alternative methods facilitate faster learning and acquisition of these skills, including relaxation exercises, mental imagery, and decision-making drills. These approaches help alleviate the physical burden on athletes by balancing the workload between the physical and mental components, acknowledging that learning is an integrated process encompassing both mental and physical aspects.

The capacity for mental imagery is a crucial variable that influences performance. It is utilized to embody performance by mentally rehearsing the skill, including the elimination of errors through visualizing the correct technique. This mental rehearsal is conducted following relaxation. Most athletes who possess a clear understanding of the key aspects of skill execution can use mental imagery to compare their responses to optimal performance and subsequently correct any errors (Chamoun, 1996).

Volleyball is characterized as a mental sport distinguished by rapid motor perception and frequent changes in gameplay situations that do not maintain a constant tempo. Therefore, accurate skill performance and effective decision-making in various game situations are crucial elements required in competitions and matches. The utilization of mental abilities to manage game situations often determines a team's victory or defeat, as skill accuracy holds a primary position in volleyball due to its importance in determining the superiority of competing teams. Moreover, Zeghloul (2012) notes that volleyball differs from other similar sports because it relies on mental capacities as much as on physical conditioning. Furthermore, Anan (2012) emphasizes that practicing mental imagery as a strategy is far more effective than not using it and should be applied complementarily with physical practice to produce the best outcomes.

1.2. Statement of the problem

1.2.1 General Question

- Does mental imagery play a role in improving the skill performance among volleyball players?

1.2.2 Sub-Questions

- Does mental imagery play a role in improving relaxation among volleyball players?
- Does mental imagery play a role in improving internal imagery among volleyball players?
- Does mental imagery play a role in improving external imagery among

volleyball players?

1.2.3 General Hypothesis

Mental imagery plays a role in improving the skill performance among volleyball players.

1.2.4 Sub-Hypotheses

- Mental imagery plays a role in improving relaxation among volleyball players.
- Mental imagery plays a role in improving internal imagery among volleyball players.
- Mental imagery plays a role in improving external imagery among volleyball players.

1.3 Study Objectives

The objectives of this study are as follows:

- To identify the actual role that mental imagery plays in improving the skill performance of volleyball players.
- To understand the importance of the connection and harmony between the mental and physical aspects that contribute to effective skill execution.
- To provide insights and recommendations on how to integrate mental imagery into volleyball club training programs.
- To examine the key sensory processes that positively support mental imagery.
- To highlight the risks of coaches focusing solely on physical, technical, and tactical aspects while neglecting psychological components in their training programs.
- To rule out performance deterioration caused by promoting correct execution through accurate mental imagery of skills.
- To enhance the ability to repeat, stabilize, and control optimal skill performance in volleyball.
- To develop mental skill performance and prepare players for competition.

1.4 Significance of the Study

The significance of this study lies primarily in its attempt to shed light on the vital role that mental imagery plays in enhancing the performance of volleyball players. This study provides an overview of mental imagery and its impact on learning and skill development. Additionally, it highlights the integration of mental training and imaginal components within the theory and



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practice-based sessions that will be discussed. The idea is to enhance performance by providing athletes with insight into their responses to situations, allowing them to account for both the psychological and physical aspects of training, while acknowledging and developing each. It is also intended to highlight the teaching and learning of motor skills in a more contemporary and evidence-based manner, rather than the traditional and constrained approach often seen in coaching.

Furthermore, this study provides coaches with theoretical insights that can help them better understand how athletes are mentally feeling during competition, especially when under high stress. It is also a valuable resource for individuals seeking to learn more about the impact of mental imagery on volleyball performance. Moreover, by examining this area that has not been extensively studied before, the study makes a significant contribution to the body of sports science literature. It encourages further research on the topic in the future. Ultimately, the results may help make mental training more effective in sports, highlighting the importance of preparing mentally as well as physically, technically, and tactically.

1.5.1 Key Terms of the Study

1.5.1.1 Mental Imagery

1.5.1.1.1 Theoretical Definition

Mental imagery is at the core of practical thinking. It refers to the reflection of objects and phenomena that the individual has previously perceived, beginning with parts and progressing to wholes. The physiological basis of imagery involves sensory organ activity, even though these organs are not actively engaged in direct perception during the process (Al-Sattar, 2000, p. 197).

1.5.1.1.2 Operational Definition

Mental imagery is a cognitive technique used to form representations of past experiences or to generate new mental scenarios that have not yet occurred. This mental rehearsal serves as a preparatory tool for performance. It is often referred to as a “mental map,” and the clearer this map is in the athlete’s mind, the more effectively the brain can send precise signals to the body, guiding physical execution.

1.5.1.2. Skill Performance

1.5.1.2.1 Theoretical Definition

According to Mufti Ibrahim, skill performance involves equipping players with fundamental skills through structured exercises, information, and instruction, to

achieve accuracy and mastery in their execution (Hamada, 1994, p. 19).

1.5.1.2.2 Operational Definition

Skill performance is defined as the most efficient method of executing a skill with minimal physical effort.

2. Literature Review

A growing body of research has investigated the impact of mental imagery on physical and skill performance in volleyball. These studies provide valuable insights into how mental training strategies, particularly imagery-based techniques, contribute to athletic development, particularly in the context of volleyball.

Ghadban and Atia (2024) investigated the impact of a mental training program on the physical abilities of volleyball players. Using an experimental design with control and experimental groups, the study involved 28 male players from Iraq. The findings revealed statistically significant improvements in the physical abilities of the experimental group in the post-test, indicating that the mental training program had a positive impact on their physical abilities. The researchers recommended integrating such programs into regular training schedules to enhance physical performance.

Similarly, Aroui et al. (2021) conducted a field study on volleyball players and coaches from Djelfa Province to explore the role of mental imagery in improving sports performance. The sample included 32 players and 10 coaches across three teams. Using a descriptive survey approach and a structured questionnaire, the study concluded that both players and coaches value mental imagery as an essential tool for supporting tactical and technical training. Moreover, it was found to help players better anticipate competitive situations.

In another study, Lbachiri (2021) examined the effect of incorporating mental imagery throughout a comprehensive annual physical preparation program on both physical and skill-related abilities in volleyball. The study employed an experimental design involving 12 players from the Achbal Bou Saâda club. Using standardized tests and a sport-specific mental imagery scale, the study found that applying mental imagery during both general and specific phases of physical preparation significantly improved skill performance. The research emphasized the importance of integrating mental training into all stages of preparation to optimize athletic output.

Ben Ghalia and Hafsaoui (2018) focused on the relationship between internal visual mental imagery and decision-making during the serve in volleyball.



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Conducted on a sample of 12 female players divided into an experimental and a control group, the study implemented a mental imagery-based relaxation strategy for the experimental group. Although no statistically significant difference was found between the groups, a positive correlation emerged: the better the internal visual imagery skills, the better the quality of decision-making during serve execution. This finding highlights the nuanced and individual-specific nature of mental imagery's effectiveness.

Finally, Kataoui (2013) evaluated the effectiveness of a mental imagery training program combined with skill drills in improving basic volleyball techniques among beginners, specifically overhead passing and serve reception. The study sample consisted of 40 players divided into two equal groups: one receiving combined mental and skill training, and the other receiving only conventional skill training. Results showed statistically significant improvements in the experimental group's performance, both in pre- and post-testing, compared to the control group. The researcher concluded that integrating mental imagery into technical training programs can significantly enhance skill acquisition in novice players.

Taken together, these studies provide consistent support for integrating mental imagery into volleyball training. Whether used to enhance physical conditioning, support decision-making, or develop fundamental skills, mental imagery appears to offer considerable benefits. However, further research is needed to explore the long-term effects of mental training across various age groups, competitive levels, and psychological profiles.

3. Methodology

3.1 Exploratory Study

The exploratory study serves as a fundamental step in the research process, allowing the researcher to gain an initial understanding of the fieldwork context. As noted by Zerouati (2002), this phase helps the researcher familiarize themselves with the various aspects of the research setting by conducting field visits and engaging with the target environment (p. 23).

In this study, an exploratory survey was conducted with several volleyball clubs in the Laghouat Province, including Olympique El Assafia, Ittihad Sidi Makhoulf, Ksar El Hirane Club, Nadhala Riadi Laghouat, and Mouloudia Club of Laghouat. This phase helped in verifying the feasibility and credibility of the data collection instrument.

3.2 Research Methodology

The selection of an appropriate methodology for any study or research phenomenon is of paramount importance, as it fundamentally depends on the nature of the research problem and its hypotheses. In this study, the research problem necessitated the use of a descriptive methodology. This approach was chosen because it aligns perfectly with the nature of our research topic and is the most suitable for answering the questions posed regarding it.

3.3 Population and Sample

The population for this research consisted of volleyball players from several clubs within Laghouat Province, specifically: Olympique El Assafia, Ittihad Sidi Makhlouf, Ksar El Hirane Club, Nidal Sportif Laghouat Club, and Mouloudia Laghouat Sportive Club. Lastly, researchers made a research sample consisting of 60 volleyball players selected using a random sampling method.

3.4 Timeframe and Location of the Study

- Timeframe: The study was conducted between December 2024 and May 2025.
- Location: The fieldwork took place in volleyball clubs located in Laghouat Province.
- Population: The study focused on volleyball players affiliated with local clubs.

3.5 Variables of the Study

3.5.1 Independent Variable: Mental imagery.

3.5.2 Dependent Variable: Skill performance in volleyball.

3.6 Data Collection Tools

A combination of relevant literature, including books, journals, and theses on mental imagery, motor performance, and volleyball, informed the development of the research instrument.

3.7 The Questionnaire

The questionnaire was selected as the primary data collection tool due to its efficiency in collecting a large amount of data within a limited time frame. According to Arish et al. (1999), the questionnaire is widely used in social science research to assess participants' attitudes, tendencies, motivations, and beliefs (p. 68). The instrument used in this study consisted of closed-ended items with binary ("Yes" or "No") response options, organized into three main sections.



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3.8 Questionnaire Design

The development of the questionnaire followed several key steps:

3.8.1 Item Construction

Initially, a review of the previous literature and related tools was conducted to compile a list of items that reflect aspects of mental imagery and its role in improving volleyball skill performance. Items were adapted from established scales and previous studies.

3.8.2 Expert Validation

In the second phase, the questionnaire was submitted to a panel of academic experts for content validation. The reviewers were asked to evaluate the relevance and clarity of each item and to provide feedback on the structure and thematic alignment of the questionnaire.

Validation Results: The expert panel provided input on the appropriateness of each thematic dimension. Items that were deemed misaligned or redundant were revised or removed. Construct validity and content validity were ensured through this iterative review process.

3.8.3 Psychometric Properties of the Instrument

3.8.3.1 Questionnaire Validity

3.8.3.1.1 Face Validity

To ensure the content validity of the instrument and its alignment with the study's objectives, the questionnaire was reviewed by five experts in physical and sports education from the University of Laghouat. Their feedback and suggestions were carefully examined, and modifications were made accordingly based on the panel's recommendations.

3.8.3.1.2 Construct Validity (Self-validity)

The construct validity coefficient was derived by calculating the square root of the reliability coefficient, which reached a value of 0.989. This high value indicates strong internal consistency and satisfactory construct validity.

3.8.4 Reliability of the Instrument

After presenting the questionnaire titled “The Role of Mental Imagery in Improving Skill Performance among Volleyball Players”, the researcher assessed its reliability using the Cronbach's Alpha method. This approach estimates the average correlation between items and the overall score.

Table 1. Results of Questionnaire Axis Using Cronbach's Alpha Reliability Coefficient

Study Dimensions	Number of Items	Cronbach's Alpha
Axis One	6	0.8710
Axis Two	6	0.9280
Axis Three	6	0.9310
Total Reliability	18	0.9720

SPSS 22: Bentireche and Zeghlache, 2025

As shown in the table above, Cronbach's Alpha values for all dimensions are high, ranging between **0.8710** and **0.9310**. The overall reliability coefficient for the entire instrument reached **0.9720**, indicating a high level of internal consistency. This suggests that the questionnaire is both reliable and suitable for analyzing and interpreting the study's results.

3.9 Statistical Tools

Data were analyzed using the **Statistical Package for the Social Sciences (SPSS) version 22**. The statistical analyses included the **Chi-Square test (χ^2)** to examine the relationships between categorical variables and **Cronbach's Alpha reliability coefficient** to assess the internal consistency of the questionnaire.

4. Presentation and Discussion of Results

First Axis: Mental Imagery Plays a Role in Improving Relaxation Among Volleyball Players.

The formula used: $\chi^2_{\text{calculated}} = 150.800$, $\chi^2_{\text{critical}} = 11.070$, $df = 5$, $p = .000$

Table 2. Statistical Results for the First Hypothesis

Suggestions	Freq	Pct (%)	χ^2 calculated	χ^2 tabulated	df	p-value	sig.
1	4	6.66%	150.800	11.070	5	0.000	0.05
2	1	1.66%					
3	1	1.66%					
4	1	1.66%					
5	8	13.3%					
6	45	75%					
Total	60	100%					

SPSS 22: Bentireche and Zeghlache, 2025

The table presents the frequencies and percentages for the first hypothesis. The calculated Chi-square value ($\chi^2 = 150.800$) is greater than the critical (tabulated) value ($\chi^2 = 11.070$), and the significance level (Sig. = 0.000) is less than the alpha level (0.05). Based on these results, we reject the null hypothesis and accept the alternative hypothesis, concluding that *mental imagery plays a statistically significant role in improving relaxation among volleyball players*.

Second Axis: *Mental Imagery Plays a Role in Enhancing Internal Imagery Among Volleyball Players.*

The formula used: $\chi^2 (6, N = 60) = 180.800, p < .001$

Table 3. *Statistical Results for the Second Hypothesis.*

Suggestions	Freq	Pct (%)	χ^2 Calculated	χ^2 Tabulated	df	p-value	Sig.
1	3	5%					
2	3	5%					
3	2	3.33%					
4	2	3.33%	180.800	12.592	6	0.000	0.05
5	2	3.33%					
6	3	5%					
7	45	75%					
Total	60	100%					

SPSS 22: Bentireche and Zeghlache, 2025

Table 3 presents the frequencies and percentages related to the second hypothesis. The calculated Chi-square value ($\chi^2 = 180.800$) greatly exceeds the tabulated critical value ($\chi^2 = 12.592$), with a significance level (Sig. = 0.000) that is lower than the set alpha level (0.05). Therefore, these results indicate a statistically significant difference, which leads us to reject the null hypothesis and accept the alternative hypothesis. Therefore, we conclude that *mental imagery plays a significant role in improving internal imagery among volleyball players*.

Third Axis: *Mental Imagery Plays a Role in Enhancing External Imagery Among Volleyball Players.*

The formula used: $\chi^2 (3, N = 60) = 86.000, p < .001$

Table 4. *Statistical Results for the Third Hypothesis*

Suggestions	Freq	Pct (%)	χ^2 Calculated	χ^2 Tabulated	df	p-value	Sig.
1	3	5%	86.000	7.815	3	0.000	0.05
2	4	6.66%					
3	7	11.66%					
4	46	76.66%					
Total	60	100%					

SPSS 22: Bentireche and Zeghlache, 2025

Table 4 displays the distribution of frequencies and percentages related to the third hypothesis. The calculated Chi-square value ($\chi^2 = 86.000$) is significantly higher than the critical tabulated value ($\chi^2 = 7.815$), while the significance level (Sig. = 0.000) is well below the threshold of 0.05.

These statistical indicators confirm the presence of a significant relationship, leading to the acceptance of the alternative hypothesis. Accordingly, we conclude that *mental imagery significantly contributes to the improvement of external imagery among volleyball players*.

5. Results Interpretation

5.1 Analysis and Discussion of the First Hypothesis

Based on the results from the tables related to the first hypothesis, it is evident that mental imagery plays a role in improving relaxation in volleyball players. This is shown through the players' responses, which indicate that mental imagery can only be performed effectively when the athlete is relaxed. This mental state enables them to execute skills without tension or muscular strain. Therefore, we assert that mental imagery typically follows both mental and muscular relaxation.

Mental imagery is widely used in various fields, especially in sports. It may be used deliberately or unintentionally. Furthermore, imagery leads to a high level of skill mastery among athletes. The ability to control mental images has become one of the fundamental skills in enhancing athletes' performance.

Moreover, the proper use of mental imagery helps athletes manage pressure and avoid muscular tension during and after matches. It also helps regulate emotional responses, maintain focus and attention, and boost self-confidence. It supports game planning and execution and assists in problem-solving.



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This finding aligns with the study of Merniz (2020), titled: *"The effect of a mental training program for the skills of relaxation and imagery on reducing aggressive behavior in handball."* Based on the above, we conclude that our study supports the hypothesis that mental imagery contributes to improved relaxation in volleyball players.

Chamoun also notes the importance of "replacing situations of stress, anxiety, or fear with ones that promote self-confidence," and "substituting negative situations and emotional control problems like anger with positive alternatives and focusing on good performance."

Furthermore, Martinez affirms that mentally imagining the execution of a specific skill triggers mental activity that strengthens the neural pathways responsible for transmitting nerve signals to the working muscles. Mental imagery offers athletes multiple opportunities to recall mental images of scenarios that may be challenging to practice physically during training.

5.2 Analysis and Discussion of the Second Hypothesis

The results in the corresponding table indicate that mental imagery plays a role in improving internal imagery in volleyball players. This is evident from players' responses, which suggest that skill development relies heavily on consistently and repeatedly visualizing movements. These mental images become stored as mental programs, which in turn enhance decision-making and adaptability in situations with both complex and straightforward motor demands. This cognitive adaptation to dynamic gameplay helps in rapid performance execution and accurate skill translation during matches. According to Allaoui, mental imagery can help athletes learn and master game plans and strategies specific to their sport.

Additionally, Ghadban & Atia (2024) emphasize that a training program incorporating mental practice contributed to improving the physical abilities of volleyball players. They recommend applying mental training techniques more widely to enhance players' physical capabilities.

Our study's findings also align with the research of Ben Ghalia and Hafsaoui (2018), which concluded that there is no statistically significant relationship between internal visual imagery skills and decision-making; however, a positive correlation was found between the two variables. i.e., the higher the internal visual mental imagery skills, the better the decision-making during skill execution.

5.3 Analysis and Discussion of the Third Hypothesis

According to the results of the third hypothesis, mental imagery contributes to improving external imagery among volleyball players. Players' ability to mentally recall basic skills as they are seen in reality enhances their technical performance.

Improving volleyball skills depends on retrieving both internal and external mental images as a reference. This process accelerates the player's motor rhythm during performance. Moreover, the ideal visualization of skills and their perfect execution reduces physical effort and enhances the body's mechanical response, preparing it to perform the required movements effectively.

Moufti (2002) suggests that mental training aids athletes in recalling sensations associated with optimal performance. Daily mental training plays a role in acquiring, practicing, and refining motor skills. Accurate mental visualization of a skill supports the neural pathways that enable the athlete to execute it correctly during repetition. Moreover, Allaoui confirms that mental imagery training increases the speed of learning various motor skills by recalling the correct movement model.

6. Conclusion

After thoroughly analyzing the data and examining the results obtained throughout this study, it is now possible to draw meaningful conclusions regarding the role of mental imagery in enhancing skill performance among senior volleyball players. The purpose of this final section is to synthesize the key findings, reflect on their significance within the broader context of sports performance and psychological preparation, and highlight the practical implications for coaches, athletes, and sports psychologists. This conclusion also provides recommendations for future practice and research, grounded in the evidence and insights generated by the study.

The findings of this study demonstrate that mental imagery plays a significant role in improving the technical performance of volleyball players. Although often overlooked, mental imagery is a crucial component of training that warrants greater attention due to its proven contribution to achieving high-level results, particularly in competitive settings. By incorporating mental imagery into both theoretical and practical training sessions, coaches can help athletes enhance their focus, decision-making, and overall execution of skills.

It is undeniable that every individual engages in some form of thinking and mental imagery, consciously or unconsciously. However, the key lies in



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understanding how, when, and for what purpose these mental processes are activated. A professional athlete can harness their cognitive and imaginative capacities at the right time, in the proper context, and with appropriate responses. Volleyball, as a fast-paced and cognitively demanding team sport, requires high levels of focus and rapid decision-making. Any uncalculated movement or mental lapse can lead to critical mistakes. Hence, mental training in general, and mental imagery in particular, becomes essential, especially during competitions, where they support optimal performance outcomes.

In conclusion, this study aims to contribute to the development of sports performance, particularly in volleyball, by raising awareness among coaches, team managers, and practitioners about the value of mental imagery in skill development. Encouraging the integration of psychological preparation into regular training routines can lead to more consistent and effective performance. Moreover, this study emphasizes the importance of a comprehensive training approach, one that encompasses not only physical and technical aspects but also psychological strategies. Future collaborations with sports psychologists and mental performance experts are highly recommended to enhance athlete preparation and long-term success further.

7. Recommendations and Suggestions

Based on the study's findings, and given the key role of mental imagery in improving volleyball performance, the following recommendations are proposed to help coaches, psychologists, and sports institutions effectively integrate it into training and development plans.

- Integrating mental imagery into sports training programs to help athletes adapt and improve performance, especially in volleyball
- Approaching the athlete as a unified biological, psychological, and social being, in line with advancements in sports psychology
- Including mental training within annual training plans to enhance skill development and address performance gaps in volleyball
- Applying mental imagery before executing any motor skill to prepare the athlete and enhance performance quality mentally
- Giving greater attention to psychological and mental preparation as a key component of modern sports training
- Conducting further scientific and field-based studies and applying them in practice to elevate athletes to higher levels

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