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SPECIAL TACTICAL EXERCISES ACCORDING TO BRAIN DOMINANCE AND THEIR IMPACT ON DEVELOPING THE TACTICAL ASPECT OF VOLLEYBALL PLAYERS AGED 12–14 YEARS

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ABSTRACT

The present study aimed to investigate the effect of specially designed tactical exercises, tailored according to brain dominance patterns, on the development of certain tactical aspects among volleyball players aged 12–14 years. The researcher adopted the experimental method due to its suitability for the nature of the research problem. The sample consisted of 10 players from the Hit Sports Club, who participated in pre-tests before undergoing the training program. The program lasted 8 weeks, with an average of three training units per week. Each training unit included an educational component in which differentiation was made between right-brain-dominant and left-brain-dominant players in the method of exercise presentation. In the applied component of the unit, all players trained together regardless of brain dominance. Upon completion of the educational program, the results showed a clear improvement in the studied tactical aspects, indicating the effectiveness of the adopted training approach. Considering brain dominance contributed to enhancing players' perception and understanding of the exercises, despite their complexity.

Keywords: *Tactical, Exercises, Brain.*

INTRODUCTION

In light of the continuous evolution in sports training sciences, particularly in the game of volleyball, it has become essential for coaches and researchers to seek innovative training methods that keep pace with this progress—especially when dealing with emerging age groups. Among the most effective training tools are exercises that simulate real game situations, as they play a significant role in enhancing players' tactical abilities on the court and in reinforcing their tactical understanding.

The importance of this research stems from its focus on tactical exercises specifically designed for the age group 12–14 years, taking into account the differences in thinking patterns resulting from brain dominance. Brain dominance refers to the control exerted by one of the two cerebral hemispheres over certain cognitive and motor functions. Left-brain-dominant players tend to respond better to verbal and structured instructions, whereas right-brain-dominant players prefer visual and kinesthetic guidance. This highlights the importance of aligning the method of presentation and training with the player's dominant cognitive style to achieve an effective and rapid response to training content.

RESEARCH PROBLEM

Despite the progress achieved in sports training, many volleyball coaches in Iraq still place excessive emphasis on the physical and technical aspects of training, often neglecting the tactical and mental dimensions, which are no less important. Moreover, the prevalent use of a unified training approach for all players—without consideration of their brain dominance patterns—can result in noticeable differences in response and comprehension among players, ultimately affecting the effectiveness of the training process. This research originates from the idea of employing specially designed tactical exercises that consider the cognitive style of each player, with the aim of strengthening tactical understanding and achieving the desired developmental outcomes.

RESEARCH OBJECTIVE

The primary objective of this study is to identify the impact of specially designed tactical exercises, tailored according to brain dominance, on the development of selected tactical skills among volleyball players aged 12–14 years.

RESEARCH HYPOTHESIS

The researcher hypothesizes that there will be statistically significant differences between the pre-test and post-test results in several tactical aspects among volleyball players in the targeted age group, in favor of the post-test results, due to the application of tactical exercises designed according to brain dominance patterns.

RESEARCH FIELDS

- **Human Field:** The study includes volleyball players from Hit Sports Club, aged 12–14 years.
- **Time Frame:** The research was conducted from January 1, 2025, to February 28, 2025.
- **Spatial Field:** The research took place on the volleyball court of Hit Sports Club.

RESEARCH METHODOLOGY AND FIELD PROCEDURES

Research Methodology: The researcher adopted the experimental method with a one-group pre-test/post-test design, as this design ensures high accuracy and is appropriate for the nature of the research problem.

Research Population and Sample: The research population consisted of volleyball players from Hit Sports Club, aged between 12 and 14 years, with a total of 16 players. The main research sample was intentionally selected and consisted of 10 players, representing 62.5% of the total population. Additionally, two players from outside the main sample were used to conduct the exploratory experiment.

Table 1. Research Population and Sample

Research Population	Experimental Research Sample	Research Sample Percentage	Exploratory Experiment Players
16 players	10 players	62.5%	2 players

Research Devices and Tools

- Dell laptop.
- White projection screen.
- Volleyballs (8).
- Measuring tape.
- Volleyball court.
- Stopwatch.

- Whistle

Tactical Aspect Tests

The tests used to measure tactical aspects were selected after being reviewed by a panel of elite volleyball training experts, achieving an approval rate exceeding 85%. The approved tests included:

1. **Rapid Response Test**
2. **Motor Linkage Test**
3. **Adaptation to Changing Situations Test**

EXPLORATORY EXPERIMENT

On Wednesday, January 1, 2025, the researcher conducted an exploratory experiment involving a number of players from the original population. The aim was to assess the suitability of the Brain Dominance Scale for the target age group and to test the players' responsiveness and acceptance of theoretical explanations and visual presentations. The exploratory trial also helped determine the necessary technical and procedural requirements, including estimating the time needed to prepare and implement the main experiment.

BRAIN DOMINANCE SCALE

Following expert review and approval (≥85%), the Brain Dominance Scale was administered to the main sample. Data were collected, coded, and statistically processed, revealing that 4 players were right-brain dominant, while 6 were left-brain dominant.

FIELD PROCEDURES

7-1Pre-tests

The pre-tests were conducted in the volleyball hall of Hit Sports Club on Friday, January 3, 2025, at 4:00 PM. All environmental and procedural variables (e.g., performance timing, venue, equipment, tools, and assisting staff) were standardized to ensure that the same conditions would be applied during the post-tests, thereby enhancing the accuracy and reliability of the results.

7-2 Main Experiment

The researcher delivered the training program to the coach, who implemented the training units for players with right and left brain dominance, under the researcher's direct supervision. The main difference in the educational component of the training unit was in the method of exercise presentation:

- **Right-brain dominant players:** Exercises were presented using visual aids (videos).
- **Left-brain dominant players:** Exercises were explained verbally using a structured approach.

This differentiation was based on the perceptual preferences of each dominance type—right-brain dominant players favor visual processing, whereas left-brain dominant players prefer verbal processing—ensuring equitable opportunities for understanding and comprehension.

The program was implemented from Sunday, January 5, 2025, to Thursday, February 27, 2025, over a period of eight weeks, with three training units per week, totaling 24 units. Each session lasted 90 minutes, of which 60 minutes were devoted to the main section, split into educational and practical parts. The educational part was tailored to the players' brain dominance, while the practical part was conducted jointly for all players.

7-3 Post-tests

The post-tests were conducted in the same volleyball hall on Friday, February 28, 2025, at 4:00 PM, following identical procedures, environmental conditions, and tools as in the pre-tests to ensure measurement stability and objectivity.

STATISTICAL METHODS

The following statistical tools were used in data analysis:

- Mean.
- Standard deviation.
- Paired sample t-test.
- Percentage.

RESULTS

- **Presentation, Analysis, and Discussion of the Results**

PRESENTATION AND ANALYSIS OF THE RESULTS

Table 2. Statistical Values of the Sample in the Pre- and Post-Tests

Variable	Measurement	Mean (M)	SD	Mean Difference (F-)	SD of Difference	Calculated T	Significance
Motor Response	Pre-test	18.020	3.131	3.013	1.138	4.629	Significant
	Post-test	15.007	1.799				
Motor Linkage	Pre-test	28.089	2.829	3.870	1.094	9.774	Significant
	Post-test	24.219	1.430				
Adaptation to Changing Situations	Pre-test	29.631	3.214	5.112	1.201	5.150	Significant
	Post-test	24.519	1.782				

Note: The tabular t-value at a significance level of 0.05 and degree of freedom (df = 9) is **2.26**.

ANALYSIS

- For the **motor response** variable, the calculated t-value (4.629) exceeded the tabular value (2.26), indicating a statistically significant improvement in favor of the post-test.
- For the **motor linkage** variable, the calculated t-value (9.774) was also greater than the tabular value, confirming a significant difference in favor of the post-test.
- For the **adaptation to changing situations** variable, the calculated t-value (5.150) exceeded the tabular value, again showing a significant difference in favor of the post-test.

These results indicate a consistent pattern of improvement across all three tactical variables after implementing the training program.

DISCUSSION OF THE RESULTS

The findings revealed that all three measured variables—motor response**,** motor linkage**,** and adaptation to changing situation**s**—showed clear and statistically significant improvement following the application of the specially designed tactical training program based on brain dominance patterns.

The researcher attributes these positive outcomes to several key factors:

1. **Individualized Presentation Method:** The differentiation in the method of presenting exercises (visual for right-brain dominant players and verbal for left-brain dominant players) aligned with players' cognitive preferences. This alignment likely enhanced the speed of understanding and the quality of performance.
2. **Well-Structured Training Program:** The thoughtful planning and organization of the training units, tailored to the players' age and abilities, contributed to improving both comprehension and execution.
3. **Consistency and Time Management:** The strict adherence to the planned schedule and consistent application of the training program played a significant role in enhancing tactical performance. Tactical capabilities are closely linked to efficient preparation and effective on-court application.

In sum, the results underscore the effectiveness of using brain-dominance-oriented tactical exercises in improving key tactical skills among volleyball players aged 12–14 years. These findings suggest that incorporating cognitive style considerations into sports training design can yield substantial benefits in skill acquisition and performance optimizatio

CONCLUSIONS

1. The specially designed tactical exercises prepared by the researcher demonstrated a clear and positive effectiveness in raising both the skill and tactical levels of the players, reflecting the success of the applied training program.
2. The tactical exercises proved to be appropriate for the targeted age group (12–14 years), contributing to the achievement of the intended objectives through the players' acceptance of the exercises and the ease of their practical application.
3. The method of presenting exercises according to the principle of brain dominance proved effective in enhancing comprehension, even when dealing with exercises characterized by complexity and precision.
4. Allocating sufficient time for the tactical component within the training units played a decisive role in strengthening players' ability to link motor sequences during gameplay, a result that was clearly reflected in the post-test outcomes.

RECOMMENDATIONS

1. Emphasize the development of tactical skills for volleyball players in the 12–14-year age group, given their direct impact on improving in-game performance.

2. Recommend the use of modern training methods that take into account individual differences in perceptual patterns, in order to facilitate practical learning and enhance response effectiveness.
3. Encourage the adoption of innovative and varied tactical exercises tailored to different age categories, as they play a crucial role in improving team performance and increasing players' readiness for competitions.

REFERENCES

[1] Alawi, M. H., & Radwan, M. N. (1982). *Motor performance tests*. Cairo: Dar Al-Fikr Al-Arabi.

[2] Al-Fartousi, A. S. (2012). *Principles of statistical methods in physical education*. Baghdad: Dar Al-Kutub wa Al-Watha'iq.

[3] Boichuk, R., Iermakov, S., Nosko, M., Nosko, Y., Harkusha, S., Grashchenkova, Z., & Troyanovska, M. (2023). Features of planning training loads of coordinating orientation in young female volleyball players aged 10-17, taking into account their age development. *Pedagogy of Physical Culture and Sports*, *27*(5), 419-428.

[4] Costa, G. C., Castro, H. O., Mesquita, I. R., Afonso, J., Lage, G. M., Ugrinowitsch, H., ... & Greco, P. J. (2018). Tactical knowledge, decision-making, and brain activation among volleyball coaches of varied experience. *Perceptual and Motor Skills*, *125*(5), 951-965.

[5] Poureghbali, S., Arede, J., Rehfeld, K., Schöllhorn, W., & Leite, N. (2020). Want to impact physical, technical, and tactical performance during basketball small-sided games in youth athletes? Try differential learning beforehand. *International Journal of Environmental Research and Public Health*, *17*(24), 9279.

[6] Popowczak, M., Domaradzki, J., Rokita, A., Zwierko, M., & Zwierko, T. (2020). Predicting visual-motor performance in a reactive agility task from selected demographic, training, anthropometric, and functional variables in adolescents. *International Journal of Environmental Research and Public Health*, *17*(15), 5322.

[7] Haugan, J. A., Lervold, K., Kaalvik, H., & Moen, F. (2025). A scoping review of empirical research on executive functions and game intelligence in soccer. *Frontiers in Psychology*, *16*, 1536174.

[8] Sebastia-Amat, S., Ardigò, L. P., Jimenez-Olmedo, J. M., Pueo, B., & Penichet-Tomas, A. (2020). The effect of balance and sand training on postural control in elite beach volleyball players. *International journal of environmental research and public health*, *17*(23), 8981.

[9] Barczyk-Pawelec, K., Rubajczyk, K., Stefańska, M., Pawik, Ł., & Dziubek, W. (2022). Characteristics of body posture in the sagittal plane in 8–13-year-old male athletes practicing soccer. *Symmetry*, *14*(2), 210.

[10] Popovych, I., Borysiuk, A., Semenov, O., Semenova, N., Serbin, I., & Reznikova, O. (2022). Comparative analysis of the mental state of athletes for risk-taking in team sports. *Journal of Physical Education and Sport*, *22*(4), 848-857.