



**APPLICATION OF ADVANCED EXERCISES TO  
IMPROVE THE EFFECTIVENESS OF HIGH-SIDE BALL RIBS  
USING RUN-UP TECHNIQUE #4 FOR MALE VOLLEYBALL  
SPECIALIZED STUDENTS OF CLASS 8, DA NANG UNIVERSITY  
OF PHYSICAL EDUCATION AND SPORTS, VIETNAM**

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**Abstract:**

Using appropriate scientific research methods, this study selected 13 exercises and 3 tests to evaluate the effectiveness of the high spike technique performed in front of the court using the number 4 approach for male volleyball students at Da Nang University of Physical Education and Sports. Experimental results showed that the system of 13 exercises applied during the experiment yielded significant results in improving the effectiveness of the high spike technique performed in front of the court using the number 4 approach.

**Keywords:** exercises, spike effectiveness, number 4 position, volleyball students, Da Nang University of Physical Education and Sports

**1. Introduction**

Da Nang University of Physical Education and Sports aims to strategically become a prestigious multidisciplinary higher education institution within the Vietnamese higher education system, while simultaneously training a comprehensive workforce with strong professional knowledge and skills to serve the country's industrialization, modernization, and international integration. Based on this, the University continuously innovates its teaching content and methods, with Physical Education being one of the areas of particular focus. Along with the growing student sports movement, many sports teams have been established and maintain regular activities, including a specialized

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student volleyball team. However, despite attracting many students, the team has not yet achieved high results in student competitions.

In volleyball, the high spike technique using a number 4 approach run is a crucial offensive technique, playing a decisive role in completing tactical combinations for the team. Practical training and competition show that volleyball students at the University of Physical Education and Sports still have limitations in the stability and effectiveness of this technique. Specifically, students mainly perform the spike instinctively, lacking good control over the ball's direction, force, and coordination of their approach run, leading to low offensive effectiveness in both training and competition.

Based on this reality, researching and applying a system of exercises to improve the effectiveness of the high spike technique using a number 4 approach run for male volleyball students at the University of Physical Education and Sports is necessary and has practical significance.

During the research process, the study used the following methods: document analysis and synthesis; pedagogical observation; interviews and discussions; pedagogical experimentation; and mathematical and statistical methods.

## 2. Research Results and Discussion

### 2.1. Selection of exercises and tests to evaluate the effectiveness of the high front-side spike technique using the number 4 approach for male volleyball students at Da Nang University of Physical Education and Sports

#### 2.1.1. Selection of Exercises

Based on the results of evaluating the current situation and identifying the causes of limitations, through analysis, literature review, and discussions with lecturers of the University, the study has compiled 21 exercises to improve the effectiveness of the high front-side spike technique using the number 4 approach for the research subjects. The exercises were divided into 3 groups:

- **Group 1:** Exercises to improve technique (8 exercises),
- **Group 2:** Exercises to improve tactics (5 exercises),
- **Group 3:** Exercises to improve physical fitness (8 exercises).

To ensure objective selection, the study sent questionnaires to 25 experts, lecturers, and coaches from several universities in Da Nang City. Exercises that received 80% or more of the selections were used in the next research steps.

The results showed that 13 exercises were selected, including:

- **Group of Exercises to Improve Technique (4 exercises):**
  - **Exercise 1:** Tapping the ball against the wall while moving: Perform 10 repetitions across the wall x 3 groups, with a 1-minute rest between groups.
  - **Exercise 2:** Strongly hitting the ball at positions 4 and 2 continuously with the setter: Perform 15 repetitions x 3 groups, with a 1-minute rest between groups.

- **Exercise 3:** Spiking the ball directly into the net: Perform 10 times x 3 sets, rest 1 minute between sets.
- **Exercise 4:** Tossing the ball, spiking it over the net to designated positions: Perform 15 times x 3 sets, rest 1 minute between sets.
  
- **Tactics Refinement Exercises (3 exercises):**
  - **Exercise 5:** Coordinating back-row attack tactics with a setter: Perform 15 times x 3 sets, rest 1 minute between sets.
  - **Exercise 6:** Coordinating number 4 and number 2 attack tactics with a setter blocking: Perform 10 times x 3 sets, rest 1 minute 30 seconds between sets.
  - **Exercise 7:** Competition Exercise: Perform 3 sets/session.
  
- **Enhancing Fitness Exercises (6 exercises):**
  - **Exercise 8:** Squat with alternating legs: Perform for 1 minute x 3 sets, rest 2 minutes between sets.
  - **Exercise 9:** 30m sprint: Perform 1 time x 3 sets, rest 1 minute 30 seconds between sets.
  - **Exercise 10:** Jump onto a 60cm platform: Perform 10 times x 3 sets, rest 2 minutes between sets.
  - **Exercise 11:** Supine crunch: Perform 30 times x 2 sets, rest 1 minute between sets.
  - **Exercise 12:** Prone push-ups: Perform 30 times x 2 sets, rest 1 minute 30 seconds between sets.
  - **Exercise 13:** Knee-to-knee jumps in the sandpit: Perform continuously for 1 minute x 3 groups, rest between groups for 1 minute 30 seconds.

### 2.1.2. Selection of Tests to Evaluate Effectiveness

To evaluate the effectiveness of the exercises, the study selected tests for the research subjects through the following steps:

- Selection through literature review, pedagogical observation, and direct interviews with instructors currently teaching and coaching volleyball,
- Selection through large-scale interviews using questionnaires,
- Determining the reliability of the test,
- Determining the informativeness of the test.

The results of the study selected 3 tests to evaluate the effectiveness of attacking spikes at positions 4 and 2, including:

- Hitting the ball against the wall in 30 seconds (number of hits),
- Hitting the ball with an active block, 20 hits (number of hits),
- 60m Run (seconds).

## 2.2. Application and Evaluation of the Effectiveness of the High Front-Wing Spike Technique using the Number 4 Approach for Male Volleyball Majors at Da Nang University of Physical Education and Sports

### 2.2.1. Experimental Organization

After selecting 13 exercises, the study conducted an experiment over one semester.

- **Experimental Method:** Parallel comparative pedagogical experiment.
  - **Experimental Subjects:** 28 volleyball majors were randomly drawn to be divided into two groups, experimental and control, each with 14 students. Specific experimental content:
    - **Experimental Group:** Applied the system of exercises selected by the study, and these exercises were considered the main exercises, arranged for training in the program, plan, and lesson plan.
    - **Control Group:** This group applied the system of exercises that had been developed according to the previous training program, plan, and lesson plan content.
  - **Experimental Duration:** 4 months, 2 sessions per week, 90 minutes each session, according to the team's training schedule (Wednesdays and Fridays, 5:00 PM - 6:30 PM)
  - **Location:** Da Nang University of Physical Education and Sports
- The experimental process is presented in Table 1.

**Table 1:** Experimental process applying exercises of the experimental group

Order	Exercise name	Training sessions/Month sequence							
		1	2	3	4	5	6	7	8
1	Exercise 1	x		x		x		x	x
2	Exercise 2		x		x		x		x
3	Exercise 3	x		x		x		x	
4	Exercise 4		x		x		x		x
5	Exercise 5	x		x		x		x	
6	Exercise 6		x		x	x	x	x	x
7	Exercise 7	x			x		x		
8	Exercise 8	x		x					
9	Exercise 9			x		x		x	x
10	Exercise 10		x						
11	Exercise 11			x		x		x	
12	Exercise 12		x				x		
13	Exercise 13		x				x		x

### 2.2.2. Evaluation of Experimental Results

Before the experiment, the study used 3 selected tests to check the effectiveness of the high-angle spike technique in front of the subject using approach run number 4, thereby comparing the differences between the two groups.

The results are presented in Table 2.

**Table 2:** Results of tests evaluating the effectiveness of the high-angle spike technique in front of the subject using approach run number 4 before the experiment

Order	Tests	Test results ( $\bar{x} \pm \delta$ )		t	P
		Control Group (n = 14)	Experimental group (n = 14)		
1	Hit the ball against the wall in 30 seconds (number of hits)	23.0±0.92	23.5±0.82	0.16	>0.05
2	Hitting the ball with an active block: 20 hits (number of hits)	12.0±2.11	11.0±2.18	0.49	>0.05
3	Run 60m (seconds)	11.8±2.05	11.6±2.15	0.95	>0.05

Table 2 shows that: before the experiment, the effectiveness of the high-angle spike technique in front of the opponent using the number 4 run-up direction did not differ significantly ( $P>0.05$ ). Thus, before the experiment, the spike effectiveness of the two groups was equivalent, and the grouping was completely objective.

After the experiment, the study continued to use 3 tests to check and compare the differences in test results between the control and experimental groups.

The results are presented in Table 3.

**Table 3:** Results of tests evaluating the effectiveness of the high-angle spike technique in front of the opponent using the number 4 run-up direction after the experiment

Order	Tests	Test results ( $\bar{x} \pm \delta$ )		t	p
		Control Group (n = 14)	Experimental group (n = 14)		
1	Hit the ball against the wall in 30 seconds (number of hits)	24±0.92	27±0.82	5.12	<0.01
2	Hitting the ball with an active block: 20 hits (number of hits)	14±2.11	17±2.18	8.76	<0.01
3	Run 60m (seconds)	11.6±2.05	10.8±2.15	7.88	<0.01

Table 3 shows that: after 4 months of experimentation, the effectiveness of attacking spikes at positions 4 and 2 of the control and experimental groups showed a statistically significant difference with  $p<0.01$ . This proves that the exercises and experimental procedures developed in this study have improved the technical effectiveness of the high front-side spike using the number 4 approach for male volleyball students at Da Nang University of Physical Education and Sports.

### 3. Conclusion

The research process selected 3 tests to evaluate effectiveness and 13 exercises to improve technique, tactics, and physical fitness in the high front-side spike using the number 4 approach for male volleyball students at Da Nang University of Physical Education and Sports.

Initial application of the selected exercises in practice has shown that the selected exercises and the developed process have proven effective in developing the technique of high front-side spikes using the number 4 approach run for male volleyball students at the Da Nang University of Physical Education and Sports.

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#### Conflict of Interest Statement

There is no conflict of interest.

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