



## A STUDY ON SELECTED SPORT-SPECIFIC PHYSICAL FITNESS EXERCISES FOR THE BOYS' FUTSAL TEAM AT LONG HUNG SECONDARY AND HIGH SCHOOL, CAN THO CITY, VIETNAM

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### Abstract:

Futsal is a sport widely favored by students as it not only supports physical development but also fosters coordination, tactical thinking, and teamwork. This study aims to select and apply specialized physical-fitness exercises for the boys' futsal team at Long Hung Secondary and High School, Can Tho City. The participants included 20 male student-athletes from the school team and 25 experts, coaches, and physical education teachers. The research used document analysis, expert surveys, pedagogical testing, pedagogical experiments, and statistical methods. The study successfully selected ten tests assessing sport-specific fitness and forty-two specialized training exercises most suited to school-level futsal. After a 12-week intervention (three sessions per week), the athletes showed marked improvement across all ten indicators, with statistically significant differences ( $p < 0.05$ ). Compared to pre-experiment results, there was a notable increase in speed, speed-strength, endurance, and agility after the experiment.

**Keywords:** exercises, tests, futsal, sport-specific physical fitness, students

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## 1. Introduction

In recent years, futsal, which is indoor football, has become one of the sports prioritized by the Vietnam Ministry of Education and Training. According to the orientation of the Department of Physical Education, school-based futsal is regarded as an effective means to enhance students' health and promote an active, healthy lifestyle. However, the effectiveness of futsal training in many schools remains limited. In practice, most school training programs still place a heavy emphasis on technical and tactical skills, while sport-specific physical fitness, which is an essential foundation for movement performance and competitive success, has not received adequate attention.

In Vietnam, particularly in the school setting, research on selecting and applying exercises to develop sport-specific physical fitness for lower and upper secondary students is still modest, especially in the Mekong Delta region. Can Tho City have a strong school sports movement. However, competition results show that the team still lacks sport-specific fitness, affecting its ability to maintain performance and achieve high results. This highlights the need for a system of training exercises tailored to students' physical characteristics, age, and school-based training conditions.

Long Hung Secondary and High School in Can Tho City has established a boys' futsal team that regularly competes in district- and city-level student competitions. Despite ongoing efforts in training, the team's performance has not been consistently stable. The athletes often show signs of early fatigue, reduced movement speed toward the end of matches, and limitations in duels and transitions, indicating a clear need for appropriate exercises to enhance sport-specific physical fitness.

From that practical situation, the authors decided to select sport-specific fitness exercises for the boys' futsal team of Long Hung Secondary and High School. The study used a scientific basis for school-based futsal training to assess the practical effectiveness of the selected exercises. The findings are not only to improve the physical-fitness training regimen of the school's futsal team but also to serve as a feasible training model for other secondary and high schools in Can Tho City and the wider Mekong Delta region. Hence, the research's title was named: A study on selected sport-specific physical fitness exercises for the boys' futsal team at Long Hung Secondary and High School, Can Tho city, Vietnam.

## 2. Methodology

Document analysis and synthesis were used to build the theoretical framework and collect information related to the study, providing the basis for defining the study's purpose, objectives, and hypotheses. These sources also supported the analysis and discussion of the study findings.

An expert survey conducted in two rounds was used to select the sport-specific fitness tests and the training exercises for the Long Hung boys' futsal team.

Pedagogical testing was carried out to administer the selected fitness tests to participants before and after the experiment.

A pedagogical experiment evaluated the effectiveness of the selected exercises when applied in a 12-week training program.

Statistical analysis was conducted using Excel and SPSS to process and analyze the collected data.

## **2.1. Participants**

20 male students from the school's futsal team (aged 13–17, with at least one year of futsal experience) and 25 experts (lecturers, coaches, and physical-education teachers) who participated in the selection survey.

## **3. Research Results and Discussions**

### **3.1. Identification of tests assessing the sport-specific physical fitness of the boys' futsal team at Long Hung Secondary and High School, Can Tho City**

To identify appropriate tests for assessing the current sport-specific fitness of the school's boys' futsal team, the study followed these steps:

- **Step 1:** Collect fitness assessment tests for boys' futsal teams from academic literature and research conducted by domestic and international authors.
- **Step 2:** Survey experts and physical-education teachers.

Based on the survey results and the established selection criteria, those that have an average approval rate of 80% or higher across both survey rounds would be retained for use in assessing the team's sport-specific fitness. Eventually, ten tests meeting the requirements were selected. These tests correspond to five key physical-fitness components, including speed, speed-strength, endurance, speed endurance, and agility/coordination, as follows:

- **Test 1:** Vertical jump heading (meters),
- **Test 2:** Long passing accuracy (within a 5-meter corridor) (meters),
- **Test 3:** 10-meter stationary ball shooting accuracy (balls/shots),
- **Test 4:** Instep juggling (times/reps),
- **Test 5:** 30-meter sprint (seconds),
- **Test 6:** 4 x 10-meter shuttle run (seconds),
- **Test 7:** 15-meter speed dribbling (seconds),
- **Test 8:** T-test (seconds),
- **Test 9:** Slalom dribbling (seconds),
- **Test 10:** Cooper test (meters).

**Table 1:** The professional fitness of the Long Hung  
Secondary and High School men's Futsal team, Can Tho City

| No. | Test  | Index     |          |      |      |           |           |
|-----|---|-----------|----------|------|------|-----------|-----------|
|     |   | $\bar{X}$ | $\delta$ | Cv%  | E    | $X_{min}$ | $X_{max}$ |
| 1   | Vertical jump heading<br>(meters)                             | 7.74      | 0.22     | 2.88 | 0.02 | 5.35      | 8.85      |
| 2   | Long passing accuracy<br>(within a 5-meter corridor) (meters) | 11.82     | 0.10     | 1.70 | 0.03 | 11.25     | 12.75     |
| 3   | 10-meter stationary ball shooting accuracy<br>(balls/shots)   | 2.80      | 0.16     | 5.56 | 0.03 | 2         | 4         |
| 4   | Instep juggling<br>(times/reps)                               | 5.35      | 0.39     | 7.34 | 0.01 | 3         | 9         |
| 5   | 30-meter sprint<br>(seconds)                                  | 6.97      | 0.12     | 1.71 | 0.03 | 6.25      | 7.88      |
| 6   | 4 x 10-meter shuttle run<br>(seconds)                         | 14.03     | 0.09     | 0.65 | 0.02 | 13.25     | 14.85     |
| 7   | 15-meter speed dribbling<br>(seconds)                         | 5.66      | 0.09     | 1.60 | 0.02 | 4.87      | 6.25      |
| 8   | T-test<br>(seconds)   | 48.18     | 0.38     | 0.80 | 0.03 | 44.56     | 49.85     |
| 9   | Slalom dribbling<br>(seconds)                                 | 7.98      | 0.08     | 0.96 | 0.01 | 7.65      | 8.86      |
| 10  | Cooper test<br>(meters)                                       | 2076.04   | 18.15    | 0.87 | 0.02 | 1956.85   | 2256.85   |

Low fitness performances may stem from the team's lack of a systematic and specialized futsal training program. These findings are consistent with the observations of Nguyễn Văn Bình (2005) and Cai Văn Hòa (2015). They both have noted that the physical fitness of secondary students, particularly in rural areas, often falls short of the demands of competitive sports. Understanding the current situation helps in the selection of appropriate exercises.

### 3.2. Selection and application of exercises to develop sport-specific physical fitness for the boys' futsal team at Long Hung Secondary and High School, Can Tho City

Based on the synthesis of various domestic and international sources, the study initially compiled a set of 42 exercises aimed at enhancing sport-specific fitness for the team.

To ensure objectivity in selecting the exercises, an additional expert survey was conducted with physical-education teachers and experts. The survey was carried out twice, one month apart, with the rule that only exercises receiving  $\geq 75\%$  approval in both rounds would be retained. Exercises failing to reach this threshold were excluded. The final selection of exercises is presented as follows.

Ngo Khen, Ho Quoc Cang, Vang Quoc Trung, Le Phu Dien  
A STUDY ON SELECTED SPORT-SPECIFIC PHYSICAL FITNESS EXERCISES FOR THE BOYS'  
FUTSAL TEAM AT LONG HUNG SECONDARY AND HIGH SCHOOL, CAN THO CITY, VIETNAM

| No. | Exercise   | Result    |     |             |    | Percentage<br>of the<br>response<br>“necessary.” |
|-----|--|-----------|-----|-------------|----|--|
|     |  | Necessary |     | Unnecessary |    |  |
|     |  | Q         | %   | Q           | %  |  |
| 1   | Agility ladder drills  | 25        | 100 | 0           | 0  | 100  |
| 2   | Playing basketball   | 22        | 88  | 3           | 12 | 88   |
| 3   | Relay drills (or relay exercises)  | 21        | 84  | 4           | 16 | 84   |
| 4   | 2-player group passing drills  | 22        | 88  | 3           | 12 | 88   |
| 5   | Group passing drills   | 23        | 92  | 2           | 8  | 92   |
| 6   | 15 high knees followed by a 30m sprint   | 21        | 84  | 4           | 16 | 84   |
| 7   | 10 head-ball jumps followed by a 30m sprint  | 25        | 100 | 0           | 0  | 100  |
| 8   | 5m backpedal followed by a 20m sprint  | 21        | 84  | 4           | 16 | 84   |
| 9   | 2-player 1v1 attacking and defending drill<br>(or 2-player 1v1 possession/duel)              | 20        | 80  | 5           | 20 | 80   |
| 10  | 2-player 1v1 attack, defend, and shot on goal  | 25        | 100 | 0           | 0  | 100  |
| 11  | 2-player ball winning and shooting drill   | 23        | 92  | 2           | 8  | 92   |
| 12  | Boomerang run  | 22        | 88  | 3           | 12 | 88   |
| 13  | 2-player central axis drill<br>(interception, shot, and defense)                             | 20        | 80  | 5           | 20 | 80   |
| 14  | Ball toss, forward roll, ball catch, and 20m sprint  | 23        | 92  | 2           | 8  | 92   |
| 15  | Push-ups and 20m sprint combination drill  | 24        | 96  | 1           | 4  | 96   |
| 16  | 3-player central wall pass/give-and-go attack<br>(around the 6-yard box)                     | 21        | 84  | 4           | 16 | 84   |
| 17  | Triangular circuit run (20m sides, 2 cones on one<br>side, 30-40cm hurdle on another)        | 25        | 100 | 0           | 0  | 100  |
| 18  | Opposite movement, passing, and ball control drill   | 21        | 84  | 4           | 16 | 84   |
| 19  | 3-player movement, feint (or dummy),<br>and shot on goal combination                         | 24        | 96  | 1           | 4  | 96   |
| 20  | 4-player dribbling, movement, passing, shooting,<br>and positional rotation                  | 21        | 84  | 4           | 16 | 84   |
| 21  | 5-player flank attack and 6-yard box defending drill   | 22        | 88% | 3           | 12 | 88%  |
| 22  | A series running to develop speed endurance  | 25        | 100 | 0           | 0  | 100  |
| 23  | Movement, dribbling, passing, and short<br>burst acceleration combination                    | 24        | 96  | 1           | 4  | 96   |
| 24  | 4-player passing and positional rotation drill   | 25        | 100 | 0           | 0  | 100  |
| 25  | 2-player cone movement and pass/return drill   | 25        | 100 | 0           | 0  | 100  |
| 26  | 2-player central wall pass/give-and-go attack  | 20        | 80  | 5           | 20 | 80   |
| 27  | 4-player movement, passing, and shot on<br>goal combination                                  | 22        | 88  | 3           | 12 | 88   |
| 28  | 2-player central wall pass/give-and-go attack  | 24        | 96  | 1           | 4  | 96   |
| 29  | Star drill (change of direction with sprint,<br>lateral shuffle, and backpedal around cones) | 21        | 84  | 4           | 16 | 84   |
| 30  | Agility ladder movement combined with<br>cone slalom/weaving                                 | 23        | 92  | 2           | 8  | 92   |
| 31  | Sprint to receive the stationary ball, followed<br>by a 10m speed dribble                    | 25        | 100 | 0           | 0  | 100  |
| 32  | 10m maximum speed slalom dribbling   | 22        | 88  | 3           | 12 | 88   |
| 33  | 4-meter speed ladder run (40cm spaces)<br>combined with thigh trap and instep kick           | 24        | 96  | 1           | 4  | 96   |

|    |  |    |     |   |    |     |
|----|--|----|-----|---|----|-----|
| 34 | Fast dribbling through cones to shoot on goal (randomly placed 8-10 cones)         | 20 | 80  | 5 | 20 | 80  |
| 35 | 4-player one-touch passing in tight space, combined with a shot on goal            | 25 | 100 | 0 | 0  | 100 |
| 36 | 3-player high-speed one-touch passing in tight space, combined with a shot on goal | 23 | 92  | 2 | 8  | 92  |
| 37 | 3-player 2 attackers vs 1 defender (2v1) with shot on goal                         | 25 | 100 | 0 | 0  | 100 |
| 38 | Opposed attack drills (2 attackers vs 3 defenders and 3 attackers vs 2 defenders)  | 21 | 84  | 4 | 16 | 84  |
| 39 | Team play against man-marking  | 23 | 92  | 2 | 8  | 92  |
| 40 | 2-player shot and defense duel   | 22 | 88  | 3 | 12 | 88  |
| 41 | Small-sided game (with mini-goals)   | 23 | 92  | 2 | 8  | 92  |
| 42 | Full-sided scrimmage   | 25 | 100 | 0 | 0  | 100 |

The use of expert surveys to select training exercises ensures both objectivity and practical relevance. The final set of 42 exercises demonstrates diversity and comprehensive coverage of key physical qualities and futsal-specific technical demands. Compared with the works of Trịnh Đình Dương (2011) and Ngô Khén (2020), the novelty of this study lies in systematizing exercises specifically for secondary-school students, with adjustments in intensity, duration, and group coordination suitable for the school environment. This provides an important practical basis for implementing effective sport-specific fitness training.

### **3.3. Evaluation of the effectiveness of the sport-specific fitness exercises for the boys' futsal team at Long Hung Secondary and High School, Can Tho City**

A 12-week training program, conducted three sessions per week, was designed to suit the training conditions of secondary-school students and to apply the selected exercises in practice.

Following the implementation of this program for the school's futsal team, the study assessed the sport-specific fitness of the experimental group, thereby providing a basis for evaluating the effectiveness of the selected exercises. The comparison of fitness indicators before and after the intervention is presented in Table 2.

**Table 2:** Results of the professional fitness test of the Long Hung Secondary and High School Futsal team after 12 weeks of training (n=20)

| No. | Test   | Indexes        |          |                 |          |       |      |        |
|-----|--|----------------|----------|-----------------|----------|-------|------|--------|
|     |  | Pre-experiment |          | Post-experiment |          | W%    | t    | p      |
|     |  | $\bar{X}$      | $\delta$ | $\bar{X}$       | $\delta$ |       |      |        |
| 1   | Vertical jump heading (meters)                             | 7.74           | 0.22     | 8.99            | 0.15     | 14.94 | 4.64 | < 0.05 |
| 2   | Long passing accuracy (within a 5-meter corridor) (meters) | 48.18          | 0.38     | 50.99           | 0.37     | 5.66  | 9.09 | < 0.05 |
| 3   | 10-meter stationary ball shooting accuracy (balls/shots)   | 2.80           | 0.16     | 4.65            | 0.15     | 49.66 | 5.95 | <0.05  |
| 4   | Instep juggling (times/reps)                               | 5.35           | 0.39     | 8.80            | 0.30     | 48.76 | 4.44 | <0.05  |
| 5   | 30-meter sprint (seconds)                                  | 6.97           | 0.12     | 6.87            | 0.14     | 1.46  | 5.49 | < 0.05 |
| 6   | 4 x 10-meter shuttle run (seconds)                         | 14.03          | 0.09     | 12.28           | 0.13     | 13.33 | 3.27 | <0.05  |
| 7   | 15-meter speed dribbling (seconds)                         | 5.66           | 0.10     | 3.40            | 0.12     | 49.82 | 2.85 | < 0.05 |
| 8   | T-test (seconds)   | 11.82          | 0.10     | 10.02           | 0.11     | 16.52 | 3.16 | < 0.05 |
| 9   | Slalom dribbling (seconds)                                 | 7.98           | 0.08     | 5.98            | 0.10     | 28.72 | 3.88 | < 0.05 |
| 10  | Cooper test (meters)                                       | 2076.04        | 18.15    | 2116.47         | 16.45    | 1.93  | 4.21 | < 0.05 |

A 12-week program was enough to see the effects of the selected exercises in the students. Training three times per week fits well within the school schedule, avoiding overtraining while still ensuring effective results. After the training program, the Long Hung futsal team shows clear improvements in sport-specific fitness. There was a growth in all of the test results, with statistically significant increases in every indicator ( $p < 0.05$ ;  $t_{\text{calculated}} > t_{\text{table}}$ ). These results confirm that the 42 selected exercises had a positive effect on the players' sport-specific fitness.

Using a variety of sport-specific exercises that closely simulate real futsal game situations helped improve multiple aspects of the players' physical fitness at the same time. This finding is consistent with previous research (Cai Văn Hòa, 2015; Lê Văn Lẫm et al., 1999), which found that training sequences involving speed, coordination, and opposition movements can significantly enhance sport-specific performance.

The study has some limitations, including a small sample size ( $n = 20$ ) and no control group. Future studies should include more participants and a control group to better assess the impact and long-term stability of the training results.

#### 4. Conclusion

The study successfully identified ten sport-specific fitness tests and forty-two training exercises suitable for the boys' futsal team at Long Hung Secondary and High School, Can Tho City.

The 12-week experimental program led to significant improvements in all ten fitness indicators ( $p < 0.05$ ). The selected exercises enhanced speed, speed endurance, strength, and agility.

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#### Conflict of Interest Statement

The authors declare no conflicts of interest.

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