



## EFFECTIVENESS OF SELECTED PHYSICAL FITNESS EXERCISES FOR MALE FOOTBALL PLAYERS AT LY TU TRONG COLLEGE, HO CHI MINH CITY, VIETNAM

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### **Abstract:**

**Background:** Football, often hailed as the "king of sports," boasts millions of players and enthusiasts. It is a sport rich in emotion, intelligence, and creativity, offering a thrilling and impassioned experience. Football matches are characterized by their high-paced tempo, extended durations, the competitive intensity of matches, and the need for rapid decision-making and the maintenance of physical endurance within tight timeframes. In training and competition, football athletes are required to not only grasp and master fundamental techniques as a robust foundation for executing technical maneuvers flawlessly in diverse situations but also exhibit considerable physical stamina. As a result, physical fitness emerges as a pivotal element. **Methods:** The study enrolled 24 male athletes from the football team at Ly Tu Trong College, Ho Chi Minh City, aged between 18 and 20. The experimental training regimen encompassed 15 exercises tailored for physical fitness development during 5 months. More particular, participants underwent three training sessions per week, each lasting 120 minutes, with 30 minutes dedicated to physical fitness training. **Results:** The outcomes of the study revealed that, following the experiment, the performance of all specialized assessments for male athletes of Ly Tu Trong College Football Team in Ho Chi Minh City exhibited statistically significant differences at a significance level of  $P < 0.05$  with  $t_{\text{calculated}} > t_{0.05} = 2.069$ . The average growth rate was calculated at  $\bar{W} = 4.01\%$ , with test 1 registering the highest average growth rate at  $\bar{W} = 5.06\%$ , while test 3 displayed the lowest average growth rate at  $\bar{W} = 2.17\%$ . **Conclusion:** It has successfully selected five fitness assessment tests and a comprehensive collection of 15 specialized physical fitness development exercises for male athletes of Ly Tu Trong College Football Team in Ho Chi Minh City. These measures aim to enhance the team's overall performance and competitiveness in the realm of football.

**Keywords:** exercises, physical fitness, football athletes, Ho Chi Minh City

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## 1. Introduction

Football is regarded as the most captivating sport globally due to the multitude of spectators flocking to stadiums to witness a match, as well as the million people watching it through television screen. With its simple rules, low cost, and emphasis on teamwork, football exerts an enormous influence on the lives of enthusiasts, local communities, and even entire nations. Hence, it can be affirmed as the most popular sport worldwide [17]. Football is a complex sport that demands a combination of various elements (technique, strategy, physical fitness, psychology). Being a direct and team-based contact sport, football perpetually introduces elements of surprise, diversity, and high emotional intensity. In the contemporary era, football has evolved comprehensively on three fronts: skills, physical fitness, and intelligence. Modern football necessitates players to possess refined technical skills, robust physical conditioning, and more notably, academic knowledge to analyze, evaluate, and make accurate judgments about on-field developments during a match. The era emphasizing the technical aspects of South American football or the physical prowess of the European football style has gradually receded into the past [20].

Football is a direct, confrontational team sport where two teams alternately engage in attacking and defending. Consequently, modern football requires the high development of all physical attributes. Football players must continuously move, and adjust running speeds throughout the game. During 90 minutes or even 120 minutes, football athletes cover a total distance of 10,000 - 15,000 meters, involving various forms of running such as short sprints, medium-paced runs, and slow jogs, interspersed with changes in direction, walking, and standing still [18]. This underscores the need for modern football players to possess abundant and versatile physical stamina. While individual technical advancements create conditions for the entire team to become more proficient and flexible in tactical formations for more effective attacks, the development of physical attributes serves as the foundation for the enhancement of technical quality. In other words, to execute advanced tactical strategies, athletes are required to perform the corresponding physical fitness and technical skills. While classical football paid little attention to physical fitness, modern football (with comprehensive tactical schemes like the 4-2-4, 4-3-3, 4-4-2, or 3-5-2 formations, especially "total football") elevates the demands on physical fitness to a higher level. The total team-based attacking and defending style also necessitates players to possess ample physical stamina and rapid mobility [12].

To effectively execute tactical activities during a match, players must ensure not only maintaining high intensity throughout the game but also sustaining performance in increasingly fatiguing conditions towards the match's conclusion. As the roles and responsibilities of players in modern football expand, the pace of play escalates, the ability to transition rapidly from offense to defense and vice versa intensifies, and the competition becomes fiercer, football players are demanded to operate with high intensity throughout the match. Consequently, a high level of physical fitness aids players in executing precise technical actions, sustaining concentration, and maintaining

a high level of attention throughout the match. *Dominating spatial and temporal control is the foremost element of modern football: gaining initiative through control, adjusting the pace of the game, employing appropriate, effective techniques, and high-level strategic applications* [19]. The fundamental basis for tactical technical activities is abundant and versatile physical fitness, which includes strength, endurance, speed, and agility.

It is widely known that in order to elevate football proficiency, physical qualities such as agility, flexibility, endurance, and skills must also be elevated. Moreover, the demands for physical fitness are essential in the context of modern football's development trends and serve as the foundation for refining technical and strategic aspects. Therefore, in football coaching at any level, physical fitness training remains of utmost importance.

## 2. Material & methods

### 2.1 Participants

The study was conducted at Ly Tu Trong College in Ho Chi Minh City, Vietnam, from February to June 2023. The study participants are 24 professional Football athletes playing for football teams in Ly Tu Trong College Ho Chi Minh City. All of them are male, and their age ranges from 18 to 20 years old. They have received training from coaches for about one to three years and have similar experience in competitions.

### 2.2 Intervention

To select the appropriate training exercises, first, the researchers carefully reviewed some books and curricula used for football training, such as John Jaman (1976) [7], Nguyen Thiet Tinh (1997) [12], Alagich R. (1998) [1], Nguyen The Truyen, Le Quy Phuong, Nguyen Kim Minh, Nguyen Duc Nhuan, Nguyen Thi Tuyet (1999) [14], Ma Thuyet Dien (2001) [4], Thanh Huyen (2001) [6], Nguyen The Truyen, Nguyen Kim Minh, Tran Quoc Tuan (2002) [13], Vietnam Football Federation (2004) [9], [10], Nguyen Hoang Yen (2015) [16], Vo Van Quyet (2016) [11], Duong Van Hien (2018) [5]. Finally, fifteen exercises were carefully selected with consultation of some coaches experienced in football training. Table 1 displays the exercises proposed for the experiment.

As presented in Table 1, the training program for the experimental group included 15 exercises with four purposes. The experiment lasted for five months with three training sessions per week, 120 minutes each session of which 30 minutes are for physical fitness training. In other words, the total number of training sessions for the experimental group in the 5-month pedagogical experiment program from February 2023 to June 2023, spanning 21 weeks, was 62 sessions, with a total duration of 124 hours of practical training (Appendix 5). The management of physical training strictly followed the program's guidelines, and any subjective factors that could affect training were eliminated in order to ensure that the results accurately reflect the impact of the exercises on the experimental subjects. The experiment program was carried out with the assistance of an experienced football coach.

**Table 1:** Description of physical fitness exercises offered to the football athletes in the experimental group

Purposes	Exercises
Developing speed	Exercise 1: High knee running at a spot
	Exercise 2: 15m sprints
	Exercise 3: 5m X 30 sprints
Developing strength	Exercise 4: Box jumps
	Exercise 5: Single-leg squats (Pistol squats)
	Exercise 6: High two-legged jumps with continuous knee lifts
	Exercise 7: Supine leg raises
	Exercise 8: Supine leg kicks
Developing endurance	Exercise 9: 5m X 30 sprints
	Exercise 10: 1000m run
	Exercise 11: 12-minute run (Cooper test)
Developing flexibility and agility	Exercise 12: 4x10m shuttle runs (zigzag)
	Exercise 13: Acceleration sprints
	Exercise 14: Zigzag X sprints
	Exercise 15: 5-5-10-10-15-15-20-20 shuttle runs

### 2.3 Assessments

The physical fitness assessment for the experimental group in football includes 5 tests conducted at both the initial and post-experiment stages. These tests were determined through a 3-step process as follows.

- Step 1: Synthesizing relevant literature on football-specific physical fitness from selected research studies to select eight suitable tests.
- Step 2: Conducting interviews with experts, specialists, and coaches, which led to the selection of five tests.
- Step 3: Assessing the reliability of the chosen tests through the pre-test method [3], [8], [15].

The physical fitness tests were administered to the experimental group in two phases, with a 5-day interval between the two assessments. The testing conditions remained consistent between the two assessments. Then, the correlation coefficient (Pearson) ( $r$ ) of the results of the two trials was calculated. The results show that all five tests have  $r > 0.83$  and  $P < 0.05$ , which ensure the reliability of the test battery and could be used to assess the fitness of the participants. The five test items are described in detail in Table 2 below.

**Table 2:** Description of football physical fitness testing battery

Test items	Physical fitness assessed	How to score
Test 1: Long Jump (cm)	Explosive Strength	Athletes perform a long jump on a rubber mat. The measurement is taken from the starting line to the nearest point where the athlete's body touches the mat, and it is measured in centimeters (cm).
Test 2: 15m Sprint (s)	Speed	Athletes complete a 15-meter sprint, and their performance is timed in seconds (s) with accuracy up to 1% of a second.
Test 3: 5 x 30m Sprint (s)	Speed Endurance	Athletes perform five consecutive 30-meter sprints with a 1-minute rest between each sprint. The total time for the five sprints is recorded in seconds (s), with accuracy up to 1% of a second.
Test 4: Cooper Test (12-minute run) (m)	General Endurance	Athletes engage in continuous running for 12 minutes, and the distance covered is measured in meters (m).
Test 5: 5-cone Zigzag Run (seconds)	Agility	Athletes exert maximum effort to sprint to the first cone, execute a quick turn, sprint back to the starting line, and then zigzag to the second cone, repeating this pattern until reaching the fifth cone. Subsequently, they sprint back to the starting line. The time taken to complete this run is measured in seconds (s) with accuracy up to 1% of a second.

## 2.4 Data analysis

The results of the study were collected at two points of time, before and after the treatment. For the first time, it happened one week right before the experiment. For the second time, it occurred one week after the experiment. All data were calculated with the assistance of SPSS 22.0. The outcomes include mean (M), standard deviation (SD), mean difference, growth rate, or Percent change, paired samples t-test, and correlation coefficient (Pearson).

## 3. Results

After the experimental period, the research proceeded to evaluate the performance of the specialized physical fitness tests of the male athletes from Ly Tu Trong College Football Team in Ho Chi Minh City. Based on the collected data, the research conducted a comparison of the mean values of the athletes' performance in the specialized physical fitness tests before and after the experiment. This comparison was done through growth rate indices and testing the related average values of the two samples. (Paired Sample t-test).

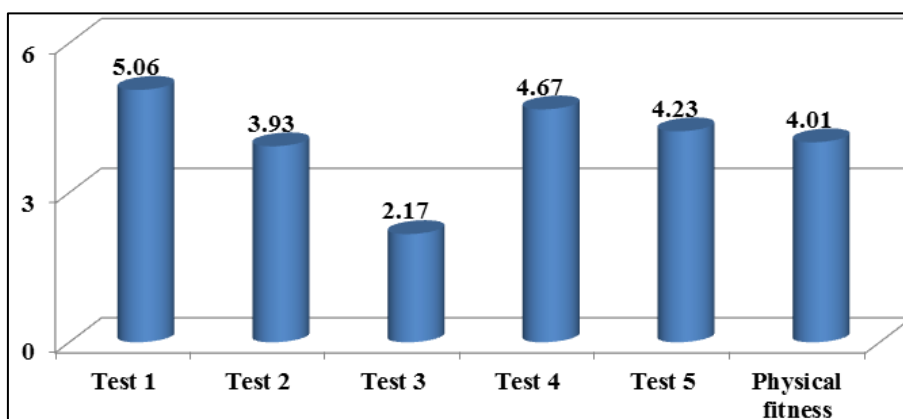
The results are presented in Table 3 below.

**Table 3:** Growth rates of specialized physical fitness assessment tests for male athletes from Ly Tu Trong College Football Team in Ho Chi Minh City after the experiment

No	Test items	Before experiment		After experiment		$\bar{W}$	t	P
		Mean	SD	Mean	SD			
1	Test 1	241.17	12.69	253.58	11.12	5.06	21.17	<0.05
2	Test 2	2.06	0.12	1.98	0.11	3.93	10.85	<0.05
3	Test 3	20.05	0.64	19.62	0.60	2.17	11.49	<0.05
4	Test 4	2965.00	174.58	3106.67	182.63	4.67	9.26	<0.05
5	Test 5	15.73	0.58	15.07	0.47	4.23	8.64	<0.05
	<b>Physical fitness</b>					4.01		

**Note:** Df = n - 1 = 23,  $t_{0.05} = 2.069$

Table 3 shows that, after the experiment, the mean values ( $\bar{X}$ ) of all specialized physical fitness assessment tests for male athletes from Ly Tu Trong College Football Team in Ho Chi Minh City have increased, and this growth is statistically significant at a probability level of  $P < 0.05$  with  $t_{\text{calculated}} > t_{0.05} = 2.069$ . Figure 1 below illustrates the growth of performance in the specialized physical fitness assessment tests for male athletes from Ly Tu Trong College Football Team in Ho Chi Minh City after the experiment.



**Figure 1:** Growth in performance in specialized physical fitness assessment tests for male athletes from Ly Tu Trong College Football Team in Ho Chi Minh City after the experiment

It is revealed that the performance in all specialized physical fitness assessment tests for male athletes from Ly Tu Trong College Football Team in Ho Chi Minh City has statistically significant differences at a probability level of  $P < 0.05$  with  $t_{\text{calculated}} > t_{0.05} = 2.069$ . The average growth rate is  $\bar{W} = 4.01\%$ , with test 1 having the highest average growth rate at  $\bar{W} = 5.06\%$ , while test 3 has the lowest average growth rate at  $\bar{W} = 2.17\%$ .

It demonstrates that the selected exercises had a positive impact on the performance of specialized physical fitness assessment tests for the experimental group, confirming the effectiveness of the chosen exercises in training.

To further affirm the effectiveness of the selected exercises on the performance of specialized physical fitness assessment tests for male athletes from Ly Tu Trong College

Football Team in Ho Chi Minh City, the researchers attempted to calculate the growth rates of each athlete after the experiment, and the results are presented in Table 4.

**Table 4:** Growth rates of performance in specialized physical fitness assessment tests of each male athlete from Ly Tu Trong College Football Team in Ho Chi Minh City after the experiment

No	Athletes	Test					
		Test 1	Test 2	Test 3	Test 4	Test 5	$\overline{W}$
1	No 1	4.02	5.84	1.89	<b>9.52</b>	5.67	<b>5.39</b>
2	No 2	4.41	4.35	3.15	2.27	5.43	3.92
3	No 3	4.48	7.14	1.36	8.18	4.42	5.12
4	No 4	<b>3.47</b>	4.12	3.47	4.69	<b>0.75</b>	3.30
5	No 5	6.90	4.44	3.20	2.17	5.28	4.40
6	No 6	3.73	2.19	1.39	2.21	5.84	3.07
7	No 7	3.68	2.34	1.65	5.31	8.95	4.39
8	No 8	4.46	4.26	2.10	5.30	6.53	4.53
9	No 9	6.90	5.66	1.67	1.90	2.73	3.77
10	No 10	5.43	3.47	1.78	6.90	2.58	4.03
11	No 11	4.50	3.83	1.76	8.10	5.96	4.83
12	No 12	3.72	3.88	1.41	4.08	3.42	3.30
13	No 13	5.11	3.39	1.94	8.17	2.45	4.21
14	No 14	5.02	3.83	1.52	7.02	3.44	4.17
15	No 15	6.61	5.57	1.63	4.55	1.62	4.00
16	No 16	4.98	3.02	3.27	6.12	1.88	3.85
17	No 17	4.57	4.26	3.16	2.27	4.83	3.82
18	No 18	4.98	<b>8.65</b>	2.92	3.85	2.00	4.48
19	No 19	4.69	2.52	1.44	2.23	1.63	<b>2.50</b>
20	No 20	6.26	2.75	1.62	2.00	2.34	3.00
21	No 21	4.29	4.60	1.60	6.96	6.81	4.85
22	No 22	5.07	<b>0.99</b>	<b>0.71</b>	4.31	4.51	3.12
23	No 23	<b>9.40</b>	1.65	<b>4.57</b>	2.25	2.51	4.08
24	No 24	4.76	1.53	2.98	<b>1.69</b>	<b>9.84</b>	4.16
$\overline{W}$		<b>5.06</b>	<b>3.93</b>	<b>2.17</b>	<b>4.67</b>	<b>4.23</b>	<b>4.01</b>

Table 4 indicates that the performance in specialized physical fitness assessment tests of all athletes has significantly improved after the experiment. Athlete No. 1 exhibited the highest average growth rate  $\overline{W}\% = 5.39\%$ , while Athlete No. 19 had the lowest average growth rate  $\overline{W}\% = 2.50\%$ .

#### 4. Discussion

Through the synthesis of the literature, and interviews with experts, specialists, and coaches, the study has selected 15 specialized physical fitness exercises for male athletes of Ly Tu Trong College Football Team in Ho Chi Minh City. Those fifteen exercises are referenced from a number of reliable experts in the field, including Alagich.R (1998) [1], Ma Tuyet Dien (2001) [4], Thanh Huyen (2001) [6], Vietnam Football Federation (2004)

[9], [10], Nguyen Thiet Tinh (1997) [12], Nguyen The Truyen – Nguyen Kim Minh – Tran Quoc Tuan (2002) [13], Nguyen Hoang Yen (2015) [16], and Duong Van Hien (2018) [5]. The exercises used in this research are adapted from those of the previous authors, and adjusted to fit the features of the experimental group.

The construction of a system of exercises for developing specialized physical fitness is the process of selecting appropriate exercises for the development of specialized physical fitness of male members of Ly Tu Trong College Football Team in Ho Chi Minh City. It includes arranging training content systematically in a scientific order, which is crucial for the development of physical fitness and technical skills for the team. To achieve its goal, the study attempted to synthesize both domestic and international documents, observe actual football training sessions at sports centers, and interview coaches and football experts in Ho Chi Minh City to create a foundation for developing specialized physical fitness and technical skills for the experimental group.

The next step is to interview experts to select the set exercises including 15 exercises that are eligible for application in the experiment. It is to ensure objectivity and reliability for the practical application in training and developing specialized physical fitness for the experimental group.

After 5 months of experiment, the study has built a specialized physical fitness training program for male football players from Ly Tu Trong College in Ho Chi Minh City. It has been developed through a process involving the review of literature and discussions with coaches and football experts in Ho Chi Minh City.

The pedagogical experiment was conducted over 5 months by applying a system of exercises aimed at developing specialized physical fitness for male members of Ly Tu Trong College Football Team in Ho Chi Minh City. The training plan for these 5 months is designed based on time duration and the distribution of other fitness exercises according to the training schedule. Taking into account the specific characteristics of each training session, the research has tried to arrange and apply the training sessions appropriately to ensure the development of two or more physical fitness qualities, such as exercises for developing speed and speed-strength, endurance and speed-strength, speed, and flexibility. During the experimental process, the authors also conducted an interview with the athletes after each training session to gather their feedback on exercise selection. The result is, all of them have stated that the exercises are arranged appropriately, and challenging yet manageable. Even though they sometimes felt somewhat tired, overall, the exercises ensured their recovery for the training sessions on the following days.

## 5. Conclusions

The research has found 15 comprehensive specialized physical fitness exercises for male football athletes in a college. The experimental group's specialized physical fitness performance has been significantly improved as a result of the 5-month long experimental program. Hence, it can be inferred that the chosen exercises have a positive



impact and are suitable to the characteristics of male football players from Ly Tu Trong College Football Team in Ho Chi Minh City. The study has also indicated that the fitness tests used are sufficiently reliable and valid to assess the performance of the young generation's specialized physical fitness.

### **Conflict of Interest Statement**

The author declares no conflicts of interest.

### **About the Author(s)**

Giang Phi Hung has been a physical education lecturer at Department Physical Education, Ly Tu Trong College of Ho Chi Minh City, Vietnam.

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