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A study on the physical development of male athletes in the five-a-side football team of Tran PHU Primary School, Long Xuyen city, An Giang Province, Vietnam

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Abstract
In recent years, five-a-side football has witnessed strong growth in Vietnam. Schools frequently organize annual football tournaments for students, while neighborhoods, communes, and districts also host children's football matches with attractive prizes. This study aims to provide information on the current status and physical development of the male athletes in the football team of Tran Phu Primary School, Long Xuyen City, An Giang Province, after one year of training. The research employed common methods used in the field of sports science, including document review, interviews, pedagogical testing, and statistical analysis, to address the research objectives. The study participants were 12 male students from the five-a-side football team of Tran Phu Primary School, Long Xuyen City, An Giang Province. The research results identified eight tests to assess physical fitness. The evaluations showed that the participants had relatively similar baseline physical fitness levels, and after one year of training, their physical fitness improved significantly, with statistically meaningful increases ranging from 2.33% to 10.05%.

Keywords: Five-a-side football, fitness, development, primary school, an giang, Vietnam

Introduction

Football is often hailed as the king of sports. In many countries, it holds a profound influence, not only on the lives of fans but also within local communities and at the national level. As such, it is widely considered the most popular sport in the world [1]. Football is a complex game that integrates various elements, including technical and tactical skills, physical fitness, and psychological readiness. As a direct, competitive team sport, it is full of surprises and diverse situations, making it highly engaging and emotionally charged [2]. Football is also characterized by continuous competition between two teams that take turns attacking and defending. Players must constantly move and adjust their running pace throughout the match. Over the course of 90 minutes - or even up to 120 minutes - a footballer covers a total distance of approximately 10,000 to 15,000 meters through a combination of running, walking, short sprints, moderate-speed runs, jogging, and moments of standing still [3]. Modern football, therefore, demands the comprehensive development of all aspects of physical fitness. In other words, physical fitness plays a crucial role in determining a footballer's performance in both training and competition.

Football is one of the most popular sports among students because it is easy to play and is organized regularly through sports activities both inside and outside of schools [4]. In addition, football is one of the key events in the Phu Dong Sports Festival at both the city and provincial levels. In recent years, Tran Phu Primary School has actively participated in the Phu Dong Sports Festival at both city and provincial levels, as well as in other tournaments, achieving commendable results. Over the years, grassroots football tournaments in An Giang Province have consistently received strong support from people of all ages and social backgrounds. This affirms that grassroots football serves as a foundation for the development of elite football. The student football tournament system in the province has become increasingly diverse, attracting many students to participate in both training and competition. These include the An Giang Province Student Football Tournament, the district-level Phu Dong Sports Festival, the provincial-level Phu Dong Sports Festival, and the Provincial Children's Talent Sports Festival organized by the An Giang Children's House [5]. These tournaments not only give students the chance to enjoy playing football but also provide valuable opportunities to interact with peers, develop important life skills, and broaden their experiences. Furthermore, these events serve as platforms for coaches and experts to identify and nurture promising young talents — the future stars of provincial football.

After many years of development, football in An Giang has continued to attract growing attention and investment. The provincial student football tournament system has been steadily improved, drawing an increasing number of students to participate in both training and competition. These activities have enabled coaches to spot numerous promising young players with the potential to be nurtured into future pillars of provincial football. Moreover, the ongoing community football classes and summer programs have opened additional avenues for training centers to uncover and cultivate talented players who can strengthen youth teams. [6]. However, for An Giang football to regain its place in top-level competition, coaches and players are required to fully commit to each training session to improve their physical fitness, technical skills, and tactics. Strong support from local authorities and stakeholders is also essential. More financial support would help to improve training facilities and nutrition, and provide better incentives, all of which are needed to attract young talent and allow coaches to work more effectively. To meet the practical needs of teaching and coaching the school's football team, and to ensure professional development that suits the current situation, the researcher conducted this study, titled: *A Study on the Physical Development of Male*

Athletes in the Five-a-Side Football Team of Tran Phu Primary School, Long Xuyen City, An Giang Province, Vietnam.

Methodology

1. Research methods

- **Document Review:** The method of reviewing relevant literature was employed, including works by domestic scholars, textbooks, university course materials, scientific journals, and other sources related to the research topic. This method was applied to establish the theoretical foundation, select appropriate research methods, and choose specific tests for evaluating the topic.

- **Survey Method:** This method was used to identify specific tests that can assess the physical fitness of male students on the five-a-side football team at Tran Phu Primary School, Long Xuyen City, An Giang Province. A survey questionnaire was used, employing a classification method to assess the importance level of each test, categorized as follows: Very important, Important, Neutral, Little important, Unimportant.

- **Pedagogical Testing Method:** The pedagogical testing method was applied to assess physical fitness tests for male athletes on the five-a-side football team at Tran Phu Primary School, Long Xuyen City, An Giang Province. These physical fitness tests include speed, strength, endurance, flexibility, and agility, consisting of the following tests: 15m sprint (seconds); 30m sprint (seconds); Standing long jump (centimeters); 30m hop on one leg (seconds); 300m sprint (seconds); 5 x 30m shuttle run (seconds); 4 × 10m shuttle run (seconds); 20m slalom run (seconds).

- **Statistical Mathematical Method:** The statistical mathematical method was used to process and analyze the data collected in the study. This method applied mathematical statistics and data processing through the SPSS 22.0 software.

2. Participants

- 12 male students from the five-a-side football team at Tran Phu Primary School, Long Xuyen City, An Giang Province.
- 30 experts, including lecturers, teachers, coaches, and professionals who are currently teaching and coaching sports in Long Xuyen City, An Giang Province**.**

Results and Discussions

1. Identifying the physical fitness tests for male athletes on the five-a-side football team at Tran Phu Primary School, Long Xuyen City, An Giang Province.

The following are the steps of establishing a system of physical fitness tests for male athletes on the five-a-side football team at Tran Phu Primary School, Long Xuyen City, An Giang Province

Step 1: Collecting relevant documents to select football physical fitness tests

This involves reviewing research from both domestic and international sources, such as the works of Duong Nghiep Chi (2001) [4], Nguyen Duy Chinh (2015) [5], Nguyen Luong Khanh (2012) [7], Trieu Hoang Phuong (2015) [6], Tran Manh Hung (2023) [8], Nguyen Van Chinh (2023) [9], Hoang Minh Chien (2020) [10], Vu Dinh Mai (2019) [11], Le Ngoc Han Thuyen (2017) [12], Trinh Huu Loc – Ngo Huu Phuc – Lam Van Vu – Pham Thai Vinh (2015) [13], Dang Van Nhan (2016) [14], Lam Phuoc Binh (2012) [15], Ha Viet Dung (2016) [16], Pham Thanh Phi (2017) [17], Chau Hoang Cau, Dang Minh Thanh (2025) [18], and others. After synthesizing the results and consulting with experts in the field, and considering the practical conditions of facilities, as well as the physiological and psychological characteristics of the research subjects, 12 tests were chosen to assess the physical fitness of male athletes on the five-a-side football team at Tran Phu Primary School, Long Xuyen City, An Giang Province.

Step 2: Surveying experts about the chosen physical fitness tests for male athletes on the five-a-side football team at Tran Phu Primary School, Long Xuyen City, An Giang Province.

The study attempted to conduct surveys with 30 experts with a questionnaire. The survey was conducted twice, 15 days apart, using the same evaluation method, the same test system, and the same research subjects. The results were compared to check for differences between the two surveys using a Chi-square test. The results are shown in Table 1.

Table 1: Results of the two surveys regarding the selected physical fitness assessment tests for male athletes of the five-a-side football team of Tran Phu Primary School – Long Xuyen City – An Giang Province

No.	Test	1st (n = 30)		2nd (n = 30)		χ 2	P
		Total	%	Total	%		
1	15m sprint (s)	53	88	54	90	0.04	*>0.05*
2	30m sprint (seconds)	54	90	55	92	0.08	>0.05
3	Standing long jump (centimeters)	50	83	53	88	0.86	>0.05
4	300m sprint (seconds)	50	83	49	82	0.06	>0.05
5	500m sprint (seconds)	43	72	45	75	0.56	*>0.05*
6	30m hop on one leg (seconds)	56	93	57	95	0.08	>0.05
7	10m frog jump (seconds)	45	75	43	72	0.42	>0.05
8	5 × 30m shuttle run (seconds)	56	93	57	95	0.06	>0.05
9	4 × 10m shuttle run (seconds)	44	73	45	75	0.09	*>0.05*
10	Sit-and-reach test (centimeters)	54	90	55	92	0.08	>0.05
11	Zigzag run (seconds)	44	73	45	75	0.09	*>0.05*
12	20m slalom run (seconds)	56	93	57	95	0.08	>0.05

Table 1 shows that for all the tests, the calculated $\chi 2$ value was less than the critical $\chi 2$ value of 3.84 at a significance level of $P > 0.05$, indicating that there was no statistically significant difference between the two sets of observed values at the $P > 0.05$ level. Therefore, the results of the two surveys conducted with the experts are highly consistent in their responses.

Based on the survey results presented in Table 1, the study selected the tests with a total survey score of 48 or higher (equivalent to achieving 80% of the maximum score per test per total number of survey forms distributed). Based on these results, eight physical fitness tests were determined, including 15m sprint (s), 30m sprint (seconds), Standing long jump (centimeters), 30m hop on one leg (seconds), 300m sprint (seconds), 5 × 30m shuttle run (seconds), 4 × 10m shuttle run (seconds), Sit-and-reach test (centimeters), 20m slalom run (seconds).

Step 3: Checking the reliability of the tests

To determine the reliability of the tests, the study used the pre-test method [19], [20]. The subjects were tested twice, with a 7-day interval between the two sessions. The conditions during both tests were kept the same. Afterward, the correlation coefficient (r) between the two testing sessions was calculated, and the results are shown in Table2.

Table 2: Reliability (r) of the physical fitness tests of male athletes of the five-a-side football team of Tran Phu Primary School

No.	Test	1st $\overline{X}$ ± Sx	2nd $\overline{X}$ ± Sx	r	P
1	15m sprint (s)	2.42 ± 0.07	2.42 ± 0.07	0.84	<0.05
2	30m sprint (seconds)	5.25 ± 0.16	5.27 ± 0.17	0.82	
3	300m sprint (seconds)	67.06 ± 1.96	67.06 ± 1.95	0.81	
4	30m hop on one leg (seconds)	8.28 ± 0.62	8.28 ± 0.61	0.83	
5	Standing long jump (centimeters)	181 ± 10.66	181 ±10.40	0.81	
6	Sit-and-reach test (centimeters)	9 ± 0.65	9 ± 0.58	0.83	
7	5 × 30m shuttle run (seconds)	27.76 ± 0.98	27.76 ± 0.97	0.85	
8	20m slalom run (seconds)	3.54 ± 0.13	3.55 ± 0.12	0.87	

The data in Table 2 shows that all the reliability tests have correlation coefficients between the two test sessions of $r > 0.8$ and $P < 0.05$. Therefore, the tests are sufficiently reliable for assessing the physical fitness of the study participants.

Through the steps of literature review, surveys, and reliability testing of the tests, the study has identified the physical fitness tests for male athletes on the five-a-side football team at Tran Phu Primary School, Long Xuyen City, An Giang Province. The tests include 15m sprint (s), 30m sprint (seconds), Standing long jump (centimeters), 30m hop on one leg (seconds), 300m sprint (seconds), 5 × 30m shuttle run (seconds), 4 × 10m shuttle run (seconds), 20m slalom run (seconds).

2. Assessing the initial physical status of the male athletes of the five-a-side football team of Tran Phu Primary School, Long Xuyen City, An Giang province.

To assess the physical fitness status of male athletes on the five-a-side football team at Tran Phu Primary School, the study used the eight tests selected from section 3.1. The tests from section 3.1 were conducted at the initial stage, calculating the mean value, standard deviation, coefficient of variation, and relative error of the mean. The results are shown in Table 3.

Table 3: The physical condition of the male athlete of the five-a-side football team of Tran Phu Primary School before training

No.	Parameter values / Test	$\overline{X}$	X_{Max}	X_{Min}	S_x	Cv%	ε
1	15m sprint (s)	2.42	2.52	2.32	0.07	2.81	0.02
2	30m sprint (seconds)	5.25	5.42	4.94	0.16	3.02	0.02
3	Standing long jump (centimeters)	181	200	168	10.66	5.90	0.04
4	300m sprint (seconds)	67.06	70.03	64.45	1.96	2.93	0.02
5	20m slalom run (seconds)	3.54	3.75	3.33	0.13	3.59	0.02
6	30m hop on one leg (seconds)	8.28	9.24	7.23	0.62	7.44	0.05
7	Sit-and-reach test (centimeters)	9	10	8	0.65	7.50	0.05
8	5 × 30m shuttle run (seconds)	27.76	29.64	26.27	0.98	3.52	0.02

The data in Table 3 indicate that the initial physical fitness status of the male athletes on the five-a-side football team at Tran Phu Primary School is highly representative, as $P > 0.05$. In addition, the research participants show a relatively uniform performance, with a coefficient of variation (Cv) less than 10%. The study continued to assess the physical fitness development of the participants after one year of training.

3.3. Assessing the physical status of the male athletes of the five-a-side football team of Tran Phu Primary School, Long Xuyen City, An Giang province, after one year of training

After one year of implementing the training plan, assessments were conducted, and data were collected and analyzed. The study obtained results on the physical fitness of the male athletes of the five-a-side football team at Tran Phu Primary School following one year of training. The results are presented in Table 4.

Table 4: The physical condition of the male athlete of the five-a-side football team of Tran Phu Primary School after one year of training

No.	Parameter values Test	$\overline{X}$	X_{Max}	X_{Min}	S_x	Cv%	ε
1	15m sprint (s)	2.31	2.36	2.26	0.03	1.28	0.01
2	30m sprint (seconds)	5.12	5.28	4.82	0.15	2.89	0.02
3	300m sprint (seconds)	64.09	64.81	63.24	0.56	0.88	0.01
4	30m hop on one leg (seconds)	7.89	8.55	7.11	0.41	5.15	0.03
5	Standing long jump (centimeters)	192	207	185	7.69	4.00	0.03
6	Sit-and-reach test (centimeters)	10	11	9	0.67	7.00	0.04
7	5 × 30m shuttle run (seconds)	27.12	27.87	26.01	0.51	1.88	0.01
8	20m slalom run (seconds)	3.30	3.36	3.21	0.05	1.46	0.01

The physical fitness test results of the male athletes on the five-a-side football team at Tran Phu Primary School after one year of training are highly representative, as ε > 0.05. In addition, the sample group shows a high level of consistency, with a coefficient of variation (Cv) less than 10%. The study calculated the growth rate of physical fitness development in these athletes after one year of training, as shown in Table 5.

Table 5. Growth rate of physical fitness of the male athletes on the five-a-side football team at Tran Phu Primary School before and after training

No.	Parameter values Test	$\overline{X}_{before}$	$\overline{X}_{after}$	d	t	P	W
1	15m sprint (s)	2.42	2.31	-0.11	6.53	< 0.01	4.58%
2	30m sprint (seconds)	5.25	5.12	-0.13	7.87		2.51%
3	300m sprint (seconds)	67.06	64.09	-2.97	5.95		4.53%
4	30m hop on one leg (seconds)	8.28	7.89	-0.38	3.23		4.72%
5	Standing long jump (centimeters)	181	192	11.33	6.52		6.09%
6	Sit-and-reach test (centimeters)	9	10	0.92	6.17		10.05%
7	5 × 30m shuttle run (seconds)	27.76	27.12	-0.64	3.26		2.33%
8	20m slalom run (seconds)	3.54	3.30	-0.25	5.91		7.19%
$\overline{W}$							**5.25%**

The results show the development of physical fitness among the male athletes on the five-a-side football team at Tran Phu Primary School, Long Xuyen City, An Giang Province, after one year of training as follows.

After one year of training, the mean values ($\bar{x}$) of all eight physical fitness tests showed a clear improvement at a significance level of P < 0.01, as the calculated t_{value} were greater than the critical t_{value} (t_{table} = 3.106) with degrees of freedom df = n – 1 = 11.

The average growth rate ($\overline{W}$) across the physical fitness tests was 5.25%. Overall, the development of physical fitness in the male athletes was modest. Among the tests, the sit and reach test (centimeters) showed the highest growth rate. $\overline{W}$ at 10.05%, while the 5 × 30m shuttle run (seconds) recorded the lowest growth rate $\overline{W}$ at 2.33%.

These results are illustrated in Figure 1.

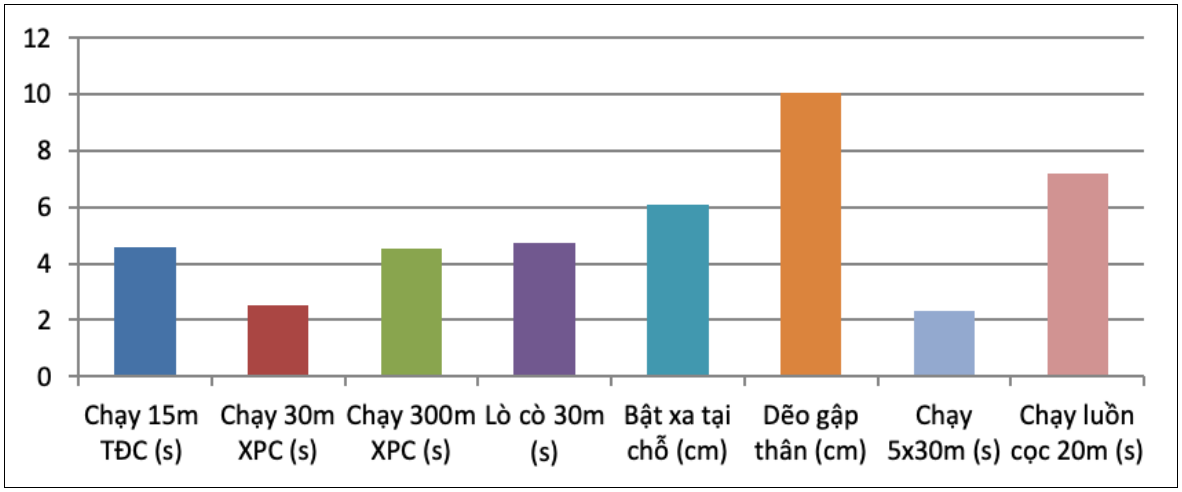

Fig 1: Physical growth of the five-a-side football team of Tran Phu Primary School after one year of training.

Conclusion

The study identified eight physical fitness tests for assessing the professional physical health of male athletes on the five-a-side football team at Tran Phu Primary School, Long Xuyen City, An Giang Province.

The physical fitness levels of these athletes were relatively consistent before the training. After one year of training, their fitness showed significant improvements, with growth rates ranging from 2.33% to 10.05%.

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