

DOI: <https://doi.org/10.59294/HIUJS.VOL.6.2024.636>

Selection and application of physical fitness evaluation tests for the U12 male football team at Nguyen Anh Thu Secondary School, District 12, Ho Chi Minh City

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ABSTRACT

Through the use of four traditional research methods including document synthesis, interviews, pedagogical testing, and statistical analysis with a sample of 12 male students, the study had synthesized documents, conducted interviews, and tested the reliability of the tests, selecting 10 physical fitness tests for the U12 male soccer team of the school with sufficient reliability (coefficient $r > 0.8$). The evaluation results of the physical fitness status of the U12 male soccer team of Nguyen Anh Thu Middle School, District 12, Ho Chi Minh City, show relatively consistent development. The mean value is highly consistent with a coefficient of variation (CV) $< 10\%$ and a relative error $\epsilon \leq 0.005$, indicating that these tests can represent the sample set. The selection and application of these tests to assess the physical fitness status of the U12 male soccer team are essential and practically significant for adjusting exercise content, training methods, and the volume and intensity of physical activity in a more scientific manner. This aims to enhance the training effectiveness and competitive achievements of the U12 male soccer team at Nguyen Anh Thu Middle School, District 12, Ho Chi Minh City.

Keywords: test, physical fitness, students, ages 12, football, Nguyen Anh Thu Secondary School

1. INTRODUCTION

Currently, football is one of the sports that is loved by many, especially by the youth. Developing and improving the quality of football has always been a strategic and long-term goal of the field of Sports and Physical Training. School football is enthusiastically welcomed with a series of tournaments for children and teenagers nationwide. This is a means for children to improve their health and express their passion for sports. It also presents an opportunity for them to become professional athletes.

At the age range of 12-13, children are going through a period of strong physical and mental development. Assessing the physical fitness of players at this age is very important to ensure they can adapt and develop well in the competitive environment, while also providing the necessary

information for coaches to make the right decisions on how to adjust the plan, lesson plan, and amount of exercise to ensure optimal results. Furthermore, physical fitness assessment also helps predict an athlete's potential and development direction in the future.

Nguyen Anh Thu Secondary School is actively responding to the physical education and sports development movement of District 12 and making efforts to improve the quality of football training. However, the U12-13 male football team has not achieved high achievement. The physical fitness of students in football is still weak compared to other schools in the district. Therefore, the research topic is "Selection and application of physical fitness evaluation tests for the U12 male football team at Nguyen Anh Thu Secondary School,

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District 12, Ho Chi Minh City". The research results will serve as a basis for the selection of exercises to improve physical fitness for students, contributing to improving the quality and effectiveness of football coaching in schools.

2. RESEARCH OVERVIEW

2.1. Physical characteristics in football practice activities

In any football activities, in order for athletes to be able to develop good techniques and tactics in situations that always change according to the match's progress, they need to be comprehensively prepared both physically and mentally in strength, speed, endurance, explosive power, suppleness, flexibility, etc. To be able to work actively and proactively in both defense and attack throughout 90 or 120 minutes of the match, players need to have better fitness levels than ever before. This requires careful and scientific preparation during training.

In the opinion of authors Nguyen Toan and Pham Danh Ton: "Physical qualities are relatively separate characteristics, aspects, and parts of human physical strength and are often divided into basic types: quickness, strength, endurance, and the ability to coordinate movements"[1].

An athlete's physical fitness means the basic movement capacity of the athlete's body, which is an important component of the athlete's ability to compete. In the case of football, it can be called "football fitness". It is the physical fitness of football athletes [2].

Quickness: The ability to perform movements in the shortest amount of time. Speed is a combination of three components: Reaction speed, movement speed, and movement frequency. The factor that determines the speed of all forms of speed is the plasticity of the nervous process expressed in the ability to rapidly change between excitement and inhibition in the nerve centers.

Quickness is one of the basic qualities of a football athlete. It occupies a special position in the athlete's physical qualities. Nowadays, due to the increasing speed of matches, the requirement for agility of football athletes is also increasing. At a certain level, good speed in competition is always

an important factor to help dominate in terms of space and time. This not only shows in the intensity of the attack but also creates confidence in the defense for the whole team. In recent years, many of the world's most elite football teams have considered speed as one of the main criteria for evaluating and selecting athletes.

Quickness qualities in football include:

- + Mobility speed: Human movement distance in a unit of time.
- + Reaction speed: The athlete's ability to react to various types of external stimuli in a unit of time.
- + Movement speed: The angle and number of movements completed within an amount of time for the athletes.

Strength: The ability to overcome external gravity using muscular effort. In sports activities, strength always have a correlation to other physical qualities, especially speed and endurance. Therefore, strength is divided into three forms: maximum strength, fast strength, and endurance strength. Strength qualities are the basis for other physical qualities, and are also the basis for athletes to master motor skills and improve their motor performance. In today's football matches, which are fierce and fast-paced, each athlete on the field must continuously perform movements such as running, jumping, stopping, starting quickly, moving, and restoring inertia and resistance. In addition, each player must also perform excellent technical movements quickly and accurately, including kicking techniques, keeping the ball, dribbling, heading, and goal-kicking in conditions of opposition fighting and blocking for the ball. Therefore, strength has become one of the important measures in physical training for football athletes.

Endurance: The ability of the human body to resist fatigue to complete work for a long time with a certain intensity and effectively. Football is a sport that requires continuous and non-stop movement with a high demand on the athlete's endurance level. They have to run thousands of meters and compete fiercely with their opponents hundreds of times to complete technical and tactical movements. In addition, athletes also have to move in unexpected and

fast ways with reduced rest time between runs and breaks.

Flexibility: The ability to perform movements with large amplitude. Maximum amplitude of movement is a measure of flexibility capacity. Flexibility is essential for athletes to complete exercises with a large range of movements, which is an important premise to achieve the required quality and quantity of movements. In football matches, the athlete's body and the ball are always in a state of unpredictable activity. The angle of the athlete's technical movements is relatively large and typically uses sudden force, so the requirements for the athlete's flexibility are very high. The quality of flexibility can be divided into two types: One is general flexibility and specialized flexibility. Specialized flexibility in football is not only related to the activities of important joints in the body but also important in specialized football movements. Major joints such as the hip, knee, and ankle joints play a key role in performing technical movements. The flexibility and durability of these joints are indispensable conditions for mastering and improving the technical level of football athletes.

2.2. Related research

In the field of football coaching, the assessment of the physical and technical level of young players plays an important role in building an effective coaching program.

The work of Ly Vinh Truong, Nguyen Hong Son, et al. in "Football Coaching Curriculum" (2017) mentions the testing and evaluation of young players' training level by age. For ages 11-12, the test includes 10 specific contents as follows: height (cm), weight (kg), Standing long jump (cm), 30m flying sprint, ball juggling, 400 (m) run, ball dribbling (s), standard ball shot 11 (m), single reflex, complex reflex. These tests give the coach an overview of the physical and technical aspects of young players, thereby offering appropriate coaching methods to improve and develop their football skills [2].

Research by Nguyen Thai Ben in his PhD thesis "Research On Improving Physical Fitness Level For Male Football Athletes Aged 15-16 At SHB Da

Nang Football Club" (2018) has identified the typical physical qualities of young male football athletes aged 15-16. In particular, this study has compiled and selected a series of physical fitness tests such as: running 40m 6 times, 35m ball dribbling, run and goal kick 10 consecutive times (m), spot jump (cm), throw in (m), run 100m (s) to assess the physical level of male football athletes aged 15-16, all tests ensure its reliability and informality [3].

According to Bui Quang Hai and Pham Hong Diep's "Choosing A Test To Assess Physical Fitness Level For Male Football Athletes Aged 14-15 At The Hanoi Sports Training Center", they selected 15 tests including height (cm), weight (kg), Standing long jump (cm), Shuttle run 5x30m (s), crunches (number of times/30s), 30m flying sprint (s), flexibility (cm), 15m run (s), 12-minute run (m); 5 specialized physical fitness tests: throw-in (m), 12 skills ball juggling (rotation), 100m flying sprint, dribble 30m through the goal post (s), run and goal kick 10 consecutive times (s) [4].

Vang Cong Danh: "Research On Selecting Standards For Assessing Physical Fitness Levels For Young Male Football Athletes Aged 15-16 At An Giang Football Club". The research has selected 11 tests that meet the standards in assessing physical fitness level for young football athletes aged 15-16 in An Giang Football Club which includes 30m flying sprint (s), throw-in with momentum (m), 30m zigzag run (s), long ball kick (m), spot jump (cm), 12 skills ball juggling (rotation), shoot the ball 10 times continuously with a 5m head start (s), 100m run (s), dribble 30m through the goal post (s), Cooper test (m) [5].

The above studies provide effective physical and technical assessment methods for young football players, thereby helping coaches develop appropriate training programs and improve the skills and performance of young football players.

3. RESEARCH METHODS

In order to accomplish the goals set by the research, the following research methods are used: Document analysis, interviews, pedagogical testing, and statistical methods [6].

4. RESULTS

4.1. Basis for selecting physical fitness assessment tests for the U12 male football team at Nguyen Anh Thu Secondary School, District 12, Ho Chi Minh City

In order to select physical fitness assessment tests for the U12 male football team at Nguyen Anh Thu Secondary School, District 12, Ho Chi Minh City, the research is conducted as follows:

- *Step 1:* Systematize physical fitness assessment tests for male football players aged 12-13 through documents, books, scientific journals, and related research works. The research synthesizes 30 evaluation tests for the U12 male football team at Nguyen Anh Thu Secondary School.
- *Step 2:* Through interviews with experts and specialists, select specific tests that are suitable for the target audience, and school facilities to

ensure accuracy.

The research conducted an interview questionnaire with 2 possible answers: agree and disagree. The research conducted interviews with 40 football experts, managers, coaches, and teachers with experience and seniority in teaching and training. The interview process was conducted twice on the same group of interviewees, with a 1-month interval between the two interviews. The number of questionnaires issued and collected is 30. The topic stipulates that tests with an average score of 75% or more will be selected for the test system used to evaluate physical fitness.

The results of interviews to select physical fitness assessment tests for the U12 male football team at Nguyen Anh Thu Secondary School are presented in Table 1.

Table 1. Interview results for selecting physical fitness assessment tests for the U12 male football team

TT	TEST	First interview (n=40) Number of votes	%	Second interview (n=40) Number of votes	%
1	Throwing a 2kg solid ball (m)	25	62.5	28	70
2	Bench press (3RM)	27	67.5	27	67.5
3	Weighted Squat (3RM)	20	50	17	42.5
4	Sit-up (time)	33	82.5	30	75
5	Jump rope (time/30s)	29	72.5	26	65
6	30 - 40 cm continuous platform jump	21	52.5	23	57.5
7	Ankle jump (30 seconds/time)	25	62.5	22	55
8	Frog jump 3 times x 10 times	27	67.5	27	67.5
9	Standing long jump (cm)	38	95	38	95
10	Spot jump (cm)	35	87.5	36	90
11	Leg force (kg)	17	42.5	17	42.5
12	60m run (s)	39	97.5	38	95
13	Stair climbing (times/30 seconds)	12	30	13	32.5
14	10 ball shooting (ball)	10	25	11	27.5
15	Throw-in with momentum in a 3m corridor (m)	17	42.5	17	42.5
16	20m run (s)	26	65	24	60
17	30m flying sprint (s)	37	92.5	40	100

TT	TEST	First interview (n=40) Number of votes	%	Second interview (n=40) Number of votes	%
18	T-test (s)	17	42.5	17	42.5
19	4x10m run (s)	34	85	36	90
20	Zig-Zag Running around obstacles 30m (s)	20	50	22	55
21	Double leg hop (time/5 minutes)	24	60	26	65
22	5x30 m run (s)	34	85	35	87.5
23	5x5m run	16	40	17	42.5
24	Cooper test (m)	25	62.5	25	62.5
25	1000m run (s)	36	90	37	92.5
26	Run 5 minutes at own pace (m)	33	82.5	37	92.5
27	Standing flexion (cm)	12	30	11	27.5
28	Trunk flexion (cm)	24	60	27	67.5
29	12 skills ball juggling (time)	26	65	27	67.5
30	Dribble the ball through the goal posts (s)	38	95	39	97.5

According to the convention, the topic selects the following tests to evaluate physical fitness for the U12 male football team at Nguyen Anh Thu Secondary School, District 12, Ho Chi Minh City: Sit-up (time), Standing long jump (cm), Spot jump (cm), 60m run (s), 30m flying sprint (s), 4x10m run (s), 5x30 m run (s), 1000m run (s), Run 5 minutes at own pace (m), Dribble the ball through the goal posts (s).

-Step 3: Checking the reliability of the tests

In order to determine the reliability of the system

of tests to assess the physical level of the U12 male football team at Nguyen Anh Thu Secondary School, District 12, we conducted a research test with two rounds 7 days apart. We then calculated the correlation coefficient (r) according to Pearson of the indicators between the two rounds.

+ If the correlation coefficient $r > 0.8$, the test is sufficiently reliable.

+ If the correlation coefficient $r < 0.8$, the test does not have enough reliability.

The results obtained are presented in Table 2.

Table 2. Reliability coefficient of physical fitness assessment tests of the U12 male football team at Nguyen Anh Thu Secondary School, District 12

TT	TEST	First test (n=12)	Second test (n=12)	R	p
		$\bar{X}_1 \pm \delta$	$\bar{X}_2 \pm \delta$		
1	Standing long jump (cm)	167.17±1.07	166.50±1.07	0.97	<0.05
2	Sit-up (time)	13.00±0.70	13.08±0.70	0.94	<0.05
3	30m flying sprint (s)	6.01±0.14	6.00±0.14	0.94	<0.05
4	4x10m run (s)	12.44±0.17	12.49±0.17	0.89	<0.05

TT	TEST	First test (n=12)	Second test (n=12)	R	p
		$\bar{X}_1 \pm \delta$	$\bar{X}_2 \pm \delta$		
5	Run 5 minutes at own pace (m)	888.33±2.26	880.00±2.26	0.92	<0.05
6	Spot jump (cm)	33.00±0.73	32.25±0.73	0.84	<0.05
7	5x30 m run(s)	34.18±0.39	34.07±0.39	0.94	<0.05
8	Dribble the ball through the goalposts (s)	14.17±0.62	14.13±0.62	0.91	<0.05
9	60m run (s)	11.84±0.24	11.70±0.24	0.88	<0.05
10	1000m run (s)	345.50±1.05	339.83±1.05	0.93	<0.05

Table 2 shows that 10/10 tests have ($r > 0.8$) and $p < 0.05$. This shows that the above test system is sufficiently reliable and feasible to evaluate the physical fitness level of research subjects.

Thus, through the steps of synthesizing documents to systematize the tests, interviewing experts, and testing the reliability of the selected tests, the research selected 10 scientific and objective tests ensuring reliability to assess physical fitness level which consist of Sit-up (time), Standing long jump (cm), Spot jump (cm), 60m run (s), 30m flying

sprint (s), 4x10m run (s), 5x30 m run (s), 1000m run (s), Run 5 minutes at own pace (m), Dribble the ball through the goal posts (s).

4.2. Assessing the physical condition of the U12 male football team at Nguyen Anh Thu Secondary School, District 12, Ho Chi Minh City

Based on the tests selected above, the research applied the test to evaluate the physical status of the U12 male football team at Nguyen Anh Thu Secondary School, District 12. The results are presented in Table 3.

Table 3. Physical status of the U12 male football team at Nguyen Anh Thu Secondary School, District 12, Ho Chi Minh City

STT	TEST	\bar{X}	$\pm S$	Cv%	ϵ
1	Standing long jump (cm)	167.17	± 7.03	4.21	0.02
2	Sit-up (time)	13.00	± 1.28	9.84	0.05
3	30m flying sprint (s)	6.01	± 0.17	2.90	0.02
4	4x10m run (s)	12.44	± 0.31	2.46	0.01
5	Run 5 minutes at own pace (m)	888.33	± 34.33	3.86	0.02
6	Spot jump (cm)	33.00	± 2.13	6.46	0.04
7	5x30 m run(s)	34.18	± 1.17	3.42	0.02
8	Dribble the ball through the goalposts (s)	14.17	± 1.19	8.40	0.05
9	60m run (s)	11.84	± 0.40	3.42	0.02
10	1000m run (s)	340.50	± 9.84	2.89	0.02

Based on the results from Table 3.3, the initial achievements of the test contents all have a coefficient of variation $< 10\%$, so the achievements of the subjects are relatively uniform with a high uniform average value. Relative error ≤ 0.05 proves that the average achievement value of the research content is highly representative. The current physical status of the U12 men's football team at Nguyen Anh Thu Secondary School, District 12, Ho Chi Minh City develops quite evenly ($Cv\% < 10\%$)

4. CONCLUSION

Through this research, 10 tests have been identified as sufficiently reliable with $r \geq 0.8$ to evaluate the physical fitness of the U12 male football team at Nguyen Anh Thu Secondary School.

The research concluded that the physical condition of the U12 male football team at Nguyen Anh Thu Secondary School develops quite evenly ($Cv\% < 10\%$) with high uniformity, most of which have a variation of $Cv < 10\%$, relative error $\varepsilon = 0.001 - 0.005$ which can represent the sample population.

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Lựa chọn và ứng dụng các test đánh giá thể lực cho đội tuyển bóng đá nam U12 Trường Trung học cơ sở Nguyễn Ảnh Thủ, Quận 12, Thành phố Hồ Chí Minh

Nguyễn Thị Hà và Đinh Quốc Đạt

TÓM TẮT

Thông qua việc sử dụng bốn phương pháp nghiên cứu truyền thống gồm: phân tích tổng hợp tài liệu, phỏng vấn, kiểm tra sự phạm và toán thống kê với mẫu nghiên cứu là 12 học sinh nam, qua tổng hợp tài liệu, phỏng vấn và kiểm nghiệm độ tin cậy của test, đề tài đã lựa chọn được 10 bài test đánh giá thể lực cho đội tuyển bóng đá nam U12 của trường có đủ độ tin cậy (hệ số $r > 0.8$). Kết quả đánh giá thực trạng thể lực của đội tuyển bóng đá nam U12 Trường Trung học cơ sở Nguyễn Ảnh Thủ, Quận 12, Thành phố Hồ Chí Minh cho thấy sự phát triển tương đối đồng đều, giá trị trung bình có độ đồng nhất cao với hệ số biến thiên $Cv < 10\%$ và sai số tương đối $\varepsilon \leq 0.005$, cho thấy các bài test này có thể đại diện cho tập hợp mẫu. Việc lựa chọn và ứng dụng các bài test để đánh giá thực trạng thể lực cho đội tuyển bóng đá nam U12 là rất cần thiết và có ý nghĩa thực tiễn nhằm điều chỉnh nội dung bài tập, phương pháp huấn luyện,

khối lượng và cường độ vận động ngày càng khoa học hơn. Từ đó, nâng cao hiệu quả huấn luyện và thành tích thi đấu cho đội bóng đá nam U12 của Trường Trung học cơ sở Nguyễn Ảnh Thủ, Quận 12, Thành phố Hồ Chí Minh.

Từ khóa: *test, thể lực, học sinh, tuổi 12, bóng đá, Trung học cơ sở Nguyễn Ảnh Thủ*

Received: 02/04/2024

Revised: 02/06/2024

Accepted for publication: 06/06/2024