



## DEVELOPING PROFESSIONAL ENDURANCE ASSESSMENT TESTS FOR MALE VOVINAM ATHLETES OF VIETNAM AVIATION ACADEMY

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### Abstract:

Vovinam is a traditional martial art that was founded by the Vietnamese people. To perform at a high level, Vovinam athletes must demonstrate strong technical skills, tactical thinking, physical fitness, and psychological resilience. Among these, physical fitness plays a particularly important role, as it ensures athletes can maintain dominance in both attack and defense until the final moments of a match. This study aims to develop professional endurance tests for male Vovinam athletes at the Vietnam Aviation Academy. To achieve this objective, the researchers applied methods such as document analysis, interviews, pedagogical testing, and statistical analysis. The study was conducted with 20 male athletes from the Vietnam Aviation Academy's Vovinam team. As a result, seven endurance tests were selected, and corresponding scorecards, including a comprehensive scoring system, were developed to evaluate the athletes' professional endurance. The findings show that, among the athletes assessed, 10.0% achieved an excellent level, 30.0% a good level, 35.0% an average level, 15.0% a weak level, and 10.0% a poor level.

**Keywords:** tests, professional endurance, male athlete, Vovinam, Vietnam Aviation Academy

### 1. Introduction

Over the past 75 years of establishment and development, Vovinam has been recognized as the national martial art of Vietnam. It is a direct, individual competition between two

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opponents, performed with high intensity and volume. A match consists of three rounds of two minutes each, with a one-minute break between rounds. Vovinam differs from other martial arts in that it not only uses arm and leg techniques but also features distinctive aerial attacks, such as flying scissor kicks targeting the chest, thighs, and knees. Points are awarded for strikes to the opponent's face, armored areas, and successful execution of flying leg-clamping techniques, making both offensive and defensive skills critically important. Therefore, during competition, athletes must deliver continuous strikes, maintain high concentration, react quickly, and engage almost all parts of the body [1].

According to the current competition rules, each Vovinam match lasts two minutes for both male and female athletes and involves intense psychophysiological stress, meaning that the body's energy system mainly operates anaerobically at maximum intensity [2]. Furthermore, to reach the final stages of a tournament, athletes typically must go through four to five matches or more, often competing across all weight categories within a single day. This places significant demands on their ability to endure both physical strain and psychological pressure. Practicing Vovinam helps athletes enhance essential physical qualities such as speed, strength, endurance, agility, and flexibility through the active engagement of muscles and body systems.

To achieve the highest levels of success in Vovinam, athletes are required not only to develop technical and tactical skills and psychological resilience but also exceptional physical strength, which is a decisive factor in competitive performance [2]. Recognizing the crucial role of physical conditioning, Vovinam trainers have increasingly focused on improving the physical fitness of Vovinam athletes.

This also urges the researcher to conduct his study under the title: *"Developing Professional Endurance Assessment Tests for Male Vovinam Athletes of Vietnam Aviation Academy"*.

## 2. Methodology

The research process employed the following methods. The method of synthesizing and analyzing documents was used to review and compile materials from various domestic and international sources. This helped to systematize relevant knowledge, establish a theoretical foundation, formulate and test scientific assumptions, define research objectives, select appropriate methods, and verify results throughout the project.

The interview method was applied to consult specialists in Vovinam training, aiming to identify appropriate professional endurance assessment tests for athletes at the Vietnam Aviation Academy. Both direct and indirect interviews were conducted using structured questionnaires to gather expert opinions.

The pedagogical testing method was used to verify the selected endurance assessment tests for male Vovinam athletes. Tests were administered initially and repeated after one week to examine their reliability.

Statistical mathematical methods were employed to process and analyze the collected data, using statistical formulas with the support of SPSS 22.0 software to ensure objective and accurate results.

The study involved 20 male Vovinam athletes from the Vietnam Aviation Academy. In addition, 24 experienced experts, coaches, and lecturers specializing in Vovinam training were consulted during the interview phase.

### 3. Results and Discussions

#### 3.1. Selection of professional endurance assessment tests of Male Vovinam athletes of Vietnam Aviation Academy

The study was conducted in three steps:

- **Step 1:** Synthesizing professional fitness assessment tests for Vovinam athletes. This step involved reviewing previous research by domestic and international authors such as Nguyen Van Chieu et al. (2008) [1], Nguyen Thanh Tuan (2002) [2], Vo Duc Co (2016) [3], Le Duc Anh (2021) [4], Nguyen Ngoc Cu et al. (1998) [5], Nguyen Thi Kim Hoang (2017) [6], Le Van Phuc (2017) [7], and Tran Hong Quang (2016) [8], Pham Thi Xuan Thuy (2016) [9], among others. Based on the synthesis of these materials, observations of training sessions, and consideration of the specific characteristics of the target group, fourteen tests were initially identified to evaluate the professional fitness levels of male Vovinam athletes at the Vietnam Aviation Academy.
- **Step 2:** Interviewing experts, coaches, and lecturers. A questionnaire was developed and distributed twice, one month apart, to 24 specialists involved in Vovinam training and education. Each round collected 24 completed responses. The interviews maintained consistent content and format across both rounds. Respondents were asked to rate each test on a five-point scale: 1 – Strongly Disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly Agree. The results of the interviews are presented in Table 1.

**Table 1:** Survey results regarding the endurance assessment tests for Male Vovinam athletes of Vietnam Aviation Academy

No.	Test	1st (n=24)		2nd (n=24)	
		Total score 120		Total score 120	
		Point	Proportion	Point	Proportion
1	1500m Run (seconds)	90	75%	92	77%
2	Sit-ups in 1 minute (times)	93	78%	90	75%
3	Straight punch through 10 targets (seconds)	88	73%	89	74%
4	Straight kicks in 10 seconds (times)	75	63%	78	65%
5	Right-leg roundhouse kicks at speed in 30 seconds (times)	92	77%	95	79%
6	Side push kicks at speed in	78	65%	76	63%

	10 seconds (times)				
7	<b>Left-leg roundhouse kicks at speed in 30 seconds (times)</b>	<b>91</b>	<b>76%</b>	<b>95</b>	<b>79%</b>
8	<b>Roundhouse kicks with both legs at speed in 30 seconds (times)</b>	<b>93</b>	<b>78%</b>	<b>90</b>	<b>75%</b>
9	Target kicks at 2 markers, 3 meters apart, in 30 seconds (times)	85	71%	88	73%
10	<b>Gliding roundhouse kick with front leg, moving side to side across 3 meters in 30 seconds (times)</b>	<b>92</b>	<b>77%</b>	<b>95</b>	<b>79%</b>
11	Straight kick + straight punch combo in 20 seconds (times)	83	69%	86	72%
12	Sit-down, stand-up, roundhouse kick sequence in 30 seconds (times)	86	72%	85	71%
13	Straight punch + front leg targeted kick at 2 markers, 3 meters apart, in 30 seconds (times)	86	72%	85	71%
14	<b>Double-hand speed punches at a fixed target in 30 seconds (times)</b>	<b>90</b>	<b>75%</b>	<b>99</b>	<b>83%</b>

Based on the statistics shown in Table 1, the tests that obtain a score of 75% or higher ( $\geq 90$  points) in both interview rounds would be chosen. Following the criteria, seven tests were identified to assess the professional endurance level of male Vovinam athletes at the Vietnam Aviation Academy. These tests include 1500m run (seconds), sit-ups in 1 minute (times), right-leg roundhouse kicks at speed in 30 seconds (times), left-leg roundhouse kicks at speed in 30 seconds (times), roundhouse kicks with both legs, gliding roundhouse kick with the front leg, moving side to side across 3 meters in 30 seconds (times), and double-hand speed punches at a fixed target in 30 seconds (times).

- **Step 3:** Testing the reliability of the selected tests

According to Trinh Huu Loc and Do Vinh (2010), the retest method is used to evaluate the consistency or correlation between two test times. Both tests should be conducted under identical conditions with the same subject, ensuring an adequate interval between recovery tests. The recommended interval is usually between 1 and 7 days. The results from both tests are then compared using correlation analysis with the Pearson method [10].

To determine the reliability of the seven endurance assessment tests for male Vovinam athletes at the Vietnam Aviation Academy, the study administered two tests within 7 days, ensuring that the testing conditions were the same each time. The results of the reliability tests are presented in Table 2. A correlation coefficient ( $r$ ) of  $\geq 0.8$  and a p-value of  $< 0.05$  indicate that the test is reliable. Conversely, if the correlation coefficient ( $r$ ) is  $< 0.8$  and  $p > 0.05$ , the test is considered unreliable.

**Table 2:** Reliability of the selected professional endurance assessment tests for Male Vovinam athletes of Vietnam Aviation Academy

No.	Test	Initial (n=16)		Retest (n=16)		r	P
		Mean	SD	Mean	SD		
1	1500m Run (seconds)	312.5	11.38	314.4	11.23	0.95	<0.05
2	Sit-ups in 1 minute (times)	41.32	2.06	41.11	2.04	0.94	<0.05
3	Right-leg roundhouse kicks at speed in 30 seconds (times)	58.65	2.12	58.12	2.03	0.98	<0.05
4	Left-leg roundhouse kicks at speed in 30 seconds (times)	57.58	1.98	57.98	2.04	0.96	<0.05
5	Roundhouse kicks with both legs at speed in 30 seconds (times)	58.32	1.96	58.67	2.06	0.96	<0.05
6	Gliding roundhouse kick with front leg, moving side to side across 3 meters in 30 seconds (times)	46.54	2.18	46.98	2.06	0.99	<0.05
7	Double-hand speed punches at a fixed target in 30 seconds (times)	133.43	4.08	132.98	4.82	0.95	<0.05

Table 2 presents the reliability coefficients for the professional endurance assessment tests for male Vovinam athletes at the Vietnam Aviation Academy, ranging from 0.94 to 0.99 (with  $P < 0.05$ ). This indicates that the tests have a moderate to very high level of reliability. These results demonstrate that the seven selected tests are both reliable and feasible for assessing the professional endurance of male Vovinam athletes at the Vietnam Aviation Academy. Therefore, through the research process, the following seven professional endurance evaluation tests have been selected for male athletes.

- 1500m Run (seconds), Sit-ups in 1 minute (times),
- Right-leg roundhouse kicks at speed in 30 seconds (times),
- Left-leg roundhouse kicks at speed in 30 seconds (times),
- Roundhouse kicks with both legs at speed in 30 seconds (times),
- Gliding roundhouse kick with front leg, moving side to side across 3 meters in 30 seconds (times),
- Double-hand speed punches at a fixed target in 30 seconds (times),

### 3.2. Evaluation of the professional endurance of Male Vovinam athletes of Vietnam Aviation Academy

#### 3.2.1 Transcript building

To develop a scorecard for evaluating the professional endurance level of male Vovinam athletes at the Vietnam Aviation Academy (with a total sample size of 20 athletes), classification standards were established using the "2 $\sigma$  rule." This method allows for the evaluation of each test result independently, without requiring a simultaneous and comprehensive assessment of all tests. Additionally, all test results were converted to a common intermediate measurement unit based on the C scale (ranging from 1 to 10 points) using the formula  $C = 5 + 2Z$ . For tests where performance is measured by time, the formula  $C = 5 - 2Z$  was applied. The calculation results are presented in Table 3.

**Table 3:** Professional endurance assessment scorecard  
 for Male Vovinam athletes of Vietnam Aviation Academy

No.	Test	Point									
		1	2	3	4	5	6	7	8	9	10
1	1500m Run (seconds)	347.1	338.5	329.8	321.2	312.5	303.9	295.2	286.6	277.9	269.3
2	Sit-ups in 1 minute (times)	37	38	39	40	41	42	43	44	45	46
3	Right-leg roundhouse kicks at speed in 30 seconds (times)	54	55	56	57	58	59	60	61	62	63
4	Left-leg roundhouse kicks at speed in 30 seconds (times)	53	54	55	56	57	58	59	60	61	62
5	Roundhouse kicks with both legs at speed in 30 seconds (times)	54	55	56	57	58	59	60	61	62	63
6	Gliding roundhouse kick with front leg, moving side to side across 3 meters in 30 seconds (times)	42	43	44	45	46	47	48	49	50	51
7	Double-hand speed punches at a fixed target in 30 seconds (times)	125	127	129	131	133	135	137	139	141	143

Table 3 presents the scorecard for evaluating the professional endurance level of male Vovinam athletes at the Vietnam Aviation Academy. This scorecard provides a convenient and practical tool for assessing the performance of each test individually, thereby allowing a detailed evaluation of the athletes' professional endurance across different skills.

### 3.2.2 Developing Classification Standards

To ensure effective classification of professional endurance levels, the study uses a scoring system that enables researchers to assess athletes' test results. The classification criteria are defined as follows:

- Good:  $\geq 9$  points,
- Fairly Good: 7 points to  $< 9$  points,
- Average: 3 points to  $< 7$  points,
- Weak: 1 point to  $< 3$  points,
- Poor:  $< 1$  point.

### 3.2.3 Building a Comprehensive Scorecard for Assessing Professional Endurance

Based on the results presented in Table 3, a comprehensive scoring system was developed to evaluate the overall professional endurance of male Vovinam athletes at the Vietnam Aviation Academy. The athletes are classified into five categories: Excellent, Good, Average, Weak, and Poor. The detailed results are shown in Table 4.

**Table 4:** The evaluation criteria for the general professional endurance of Male Vovinam athletes of the Vietnam Aviation Academy

Classification	Total score (maximum total score is 70)
Excellent	$\geq 63$
Good	49 - 62
Average	35 - 48
Weak	28 - 34
Less	$< 27$

Table 4 provides a comprehensive evaluation of the professional endurance levels of male Vovinam athletes at the Vietnam Aviation Academy. This scorecard serves as an important tool for coaches, enabling a more accurate and realistic assessment of athletes' endurance capabilities. Based on these evaluations, trainers can make informed adjustments to the content and intensity of training programs to better suit the athletes' needs.

#### 3.2.4 Assessment of Professional Endurance Among Male Vovinam Athletes at the Vietnam Aviation Academy

The study carried out assessments using the selected tests, and the results are presented in Table 5.

**Table 5:** The professional endurance performances of Male Vovinam athletes of Vietnam Aviation Academy (n = 20)

No.	Classification	Result	
		Amount	Percentage %
1	Excellent	2	10.00
2	Good	6	30.00
3	Average	7	35.00
4	Weak	3	15.00
5	Less	2	10.00

Table 5 shows that the proportion of Male Vovinam athletes at the Vietnam Aviation Academy with good or excellent professional endurance is relatively low. To be specific, 10.00% of them achieved an excellent rating, 30.00% were rated as good, 35.00% were rated as average, 15.00% as weak, and 10.00% as poor.

#### 4. Conclusion

- The study identified seven professional endurance assessment tests for Male Vovinam athletes of the Vietnam Aviation Academy, including: the 1500m run (seconds), sit-ups in 1 minute (times), right-leg roundhouse kicks at speed in 30 seconds (times), left-leg roundhouse kicks at speed in 30 seconds (times), roundhouse kicks with both legs at speed in 30 seconds (times), gliding roundhouse kicks with the front leg moving side-to-side across 3 meters in 30

seconds (times), and double-hand speed punches at a fixed target in 30 seconds (times).

- The study developed both an individual scorecard and a comprehensive scorecard for evaluating the professional endurance of Male Vovinam athletes at the Vietnam Aviation Academy.
- Regarding the current professional endurance levels of the athletes, 10.00% achieved an excellent rating, 30.00% achieved a good rating, 35.00% were rated as average, 15.00% as weak, and 10.00% as poor.

### Conflict of Interest Statement

The authors declare no conflicts of interest.

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