

Evaluation of Physical Development in Male Athletes of the Binh Phuoc Vovinam Team after One Training Cycle

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Abstract: This study evaluated the physical development of male athletes from the Binh Phuoc Vovinam Team following one training cycle. Standard research methods including document analysis, expert interviews, pedagogical testing, and statistical analysis were employed [1]. Seventeen general and sport specific physical fitness tests were selected to assess athlete performance before and after the training period. Paired statistical comparisons demonstrated significant improvements across all selected fitness indicators following the training cycle ($P < 0.05$). The findings indicate that the training program effectively enhanced both general and sport specific physical fitness, providing evidence to support improved training practices for competitive Vovinam athletes [2].

Keywords: Vovinam; physical fitness; athletic performance; combat sports; training adaptation; sports science; male athletes

1. Introduction

Physical fitness is one of the key factors that contribute to helping athletes win, without physical strength against fatigue, they cannot fully promote the available techniques to bring the desired results [3],[4]. Because the physical fitness assessment in Vovinam is rarely mentioned by any scientific research in Vietnam, but only focuses on psychology, technique and speed strength, I used to be a high-achieving Vovinam athlete, with the desire to contribute a small part to Binh Phuoc's Vovinam training, so I realized that if I want to achieve good performance, the physical fitness factor is an issue that cannot be taken lightly in coaching. To find out this issue, the research topic was conducted: "Evaluation of Physical Development in Male Athletes of the Binh Phuoc Vovinam Team After One Training Cycle."

Research methods: In this research, methods of document analysis and synthesis, interview methods, pedagogical examination methods, and statistical methods were used [7].

The research subjects comprised 12 male athletes from the Binh Phuoc provincial Vovinam team (aged 17 and older, with over two years of training experience and holding a yellow belt rank or higher). The research results were evaluated after one training cycle using statistical parameters, including the mean, standard deviation, paired-samples t-test, and growth rate.

2. Research Results

2.1 Selection and determination of tests to assess the physical fitness level of male athletes of the Vovinam team in Binh Phuoc province

Through the steps of synthesizing documents, systematizing tests, interviewing experts and valuating the reliability of selected tests, 17 tests were selected to evaluate physical fitness; The study selects tests with more than 70% of the selection opinions presented in Table 1.

Table 1: Results of interviews with male athletes of the Vovinam team in Binh Phuoc province [7]

TT	Test Name	1st time		2nd time	
		Number of yes votes	%	Number of yes votes	%
	Fitness tests				
1	30-m Sprint Test (Standing Start)	25	83	26	81.25
2	1-Minute Sit-Up Test	26	87	27	84.38
3	1-Minute Push-Up Test	23	77	24	75
4	3000-m Endurance Run	27	90	28	87.5
5	Standing Long Jump Test	24	80	26	81.25
6	1-Minute Back Extension Repetition Test	23	77	25	78.13
7	800-m Run Test	23	77	24	75
8	Side Split Flexibility Test	25	83	27	84.38
9	Front Split Flexibility Test	24	80	26	81.25
10	10-Second Left Roundhouse Kick Test	28	93	28	87.5
11	10-Second Right Roundhouse Kick Test	24	80	26	81.25
12	30-Second Left Straight Punch Test with Resistance Band	26	87	25	78.13
13	30-Second Right Straight Punch Test with Resistance Band	25	83	27	84.38

14	30-Second Rear-Leg Roundhouse Kick Test with Resistance Band	25	83	24	75
15	30-Second Rear-Hand Hook Punch Test with Resistance Band	24	80	26	81.25
16	2-Minute Continuous Pad Kicking Test	23	77	24	75
17	30-Second Alternating Roundhouse Kick Test (3-m Target Distance)	26	87	25	78.13

The above tests were selected to assess the physical fitness of the male athletes of the Vovinam team in Binh Phuoc province after checking to figure out the reliability and validity, selecting 17 tests.

2.2 Evaluate the physical development of male athletes of the Vovinam team in Binh Phuoc province.

After a training cycle, fitness development is assessed

through the mean, standard deviation, calculation of 2 tests and growth rate (S. Brondy) presented in tables 2 and 3.

The results obtained in table 2 show that: The achievements of the tests to assess the development of the general physical fitness of male athletes of the Vovinam team in Binh Phuoc province After a training cycle, there is an increase and is statistically significant at the probability threshold of $P < 0.05$. Specifically, as follows:

Table 2: Assessment of the general physical fitness development of the experimental male group after one training cycle. [7]

STT	Inspection Criteria	Pre-experiment			After one training cycle			t	P
		$\bar{X}_A$	δ_A	Cv	$\bar{X}_{A1}$	δ_{A1}	Cv		
1	30-m Sprint Test (Standing Start)	4.36	0.15	3.42	4.01	0.15	3.74	4.531	<0.05
2	1-Minute Sit-Up Test	62.83	1.17	1.86	65.67	1.51	2.29	4.715	<0.05
3	1-Minute Push-Up Test	51.83	1.17	2.26	55.83	0.75	1.35	6.928	<0.05
4	3000-m Endurance Run	13.01	0.9	6.89	11.55	0.3	2.61	3.958	<0.05
5	Standing Long Jump Test	260	0.11	4.29	281	0.08	2.94	4.615	<0.05
6	1-Minute Back Extension Repetition Test	68.33	2.5	3.66	72.67	1.86	2.56	7.05	<0.05
7	800-m Run Test	2.42	0.05	2.14	2.2	0.13	5.93	3.379	<0.05
8	Side Split Flexibility Test	13.03	0.86	6.63	8.85	0.87	9.82	7.082	<0.05
9	Front Split Flexibility Test	11.7	0.92	7.83	7.29	0.6	8.28	9.033	<0.05

Table =2.571

Table 2 shows that, after 01 experimental cycle, the experimental group made quick progress in the general fitness assessment indicators [5]. To clarify the development of the experimental group, the thesis has the following specific evaluations:

- **30-m Sprint Test (Standing Start).**

Through table 2 in the **30-m Sprint Test (Standing Start)** target, the achievement tends to develop significantly. Specifically, the experimental group had the pre-experimental mean value decreased from $\bar{X}_A = 4.36 \pm 0.15s$ to $\bar{X}_{A1} = 4.01 \pm 0.15s$ with an improvement $d = 0.35s$. At the same time, the calculated t-value= 4.531 > table t = 2.571 at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- **1-Minute Sit-Up Test**

At the **1-Minute Sit-Up Test** target, the achievement recorded a significant improvement. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 62.83 \pm 1.17$ times < $\bar{X}_{A1} = 65.67 \pm 1.51$ times with an improvement $d = 2.84$ times. At the same time, the calculated t-value= 4.715 > table t = 2.571 at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- **1-Minute Push-Up Test.**

At the 1-minute prone push-up target, the achievement tends to develop very well. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 51.83 \pm 1.17$ times < $\bar{X}_{A1} = 55.83 \pm 0.75$ times with an improvement $d = 4.00$ times. At the same time, the calculated t-value= 6.928 > table at the probability threshold $P < 0.05$, showing a statistically significant difference

between before and after one training cycle.

- **3000-m Endurance Run.**

At the **3000-m Endurance Run** target, the achievement shows obvious progress. Specifically, the experimental group had a pre-experimental mean value from $\bar{X}_A = 13.01 \pm 0.90$ minutes decreased to $\bar{X}_{A1} = 11.55 \pm 0.30$ minutes with an improvement $d = 1.46$ minutes. At the same time, the calculated t-value= 3.958 > table t = 2.571 at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- The target **Standing Long Jump Test.**

Through Table 2, in the indicator of rebounding on the spot, the achievement has a positive transformation after one training cycle. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 260 \pm 0.11cm$ < $\bar{X}_{A1} = 281 \pm 0.08cm$ with an improvement $d = 21cm$. At the same time, the calculated t-value= 4.615 > table at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- **1-Minute Back Extension Repetition Test.**

At the **1-Minute Back Extension Repetition** target, the achievement tends to develop strongly. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 68.33 \pm 2.50$ times < $\bar{X}_{A1} = 72.67 \pm 1.86$ times with an improvement $d = 4.34$ times. At the same time, the calculated t-value= 7.050 > table at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- **800-m Run Test.**

Through table 2 in the 800m running target, the achievement has developed effectively. Specifically, the

experimental group had a pre-experimental mean decreased from $\bar{X}_A = 2.42 \pm 0.05$ minutes to $\bar{X}_{A1} = 2.20 \pm 0.13$ minutes with an improvement $d = 0.22$ minutes. At the same time, the calculated t -value = 3.379 > table $t = 2.571$ at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- **Side Split Flexibility Test.**

Through table 2 in the horizontal indicator, performance improved significantly. Specifically, the experimental group had the pre-experimental mean value decreased from $\bar{X}_A = 13.03 \pm 0.86$ cm to $\bar{X}_{A1} = 8.85 \pm 0.87$ cm with an improvement $d = 4.18$ cm. At the same time, the calculated t -value = 7.082 > table t at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- **Front Split Flexibility Test.**

Through table 2 in the vertical index, performance improved significantly. Specifically, the experimental group had a pre-experimental mean value decreased from $\bar{X}_A = 11.70 \pm 0.92$ cm to $\bar{X}_{A1} = 7.29 \pm 0.60$ cm with an improvement $d = 4.41$ cm. At the same time, the calculated t -value = 9.033 > table t at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

In addition to the general physical fitness indicators, the thesis continues to evaluate the development of the professional physical fitness of the experimental group after the application of the exercise system. The results are presented in Table 3.

Table 3: Assessment of the development of professional physical fitness of the experimental male group after one training cycle. [7]

STT	Inspection Criteria	Pre-experiment			After one training cycle			t	P
		$\bar{X}_A$	δ_A	Cv	$\bar{X}_{A1}$	δ_{A1}	Cv		
1	10-Second Left Roundhouse Kick	21.33	0.82	3.83	24.17	0.75	3.11	5.937	<0.05
2	10-Second Right Roundhouse Kick	21.00	0.89	4.26	24.17	1.33	5.50	4.842	<0.05
3	30-Second Left Straight Punch Test with Resistance Band	62.67	1.51	2.40	67.33	1.21	1.80	5.813	<0.05
4	30-Second Right Straight Punch Test with Resistance Band	63.67	1.51	2.36	65.33	2.07	3.16	5.000	<0.05
5	30-Second Rear-Leg Roundhouse Kick Test with Resistance Band	40.83	1.94	4.75	43.50	1.87	4.30	4.781	<0.05
6	30-Second Rear-Hand Hook Punch Test with Resistance Band	21.50	1.38	6.41	25.00	1.41	5.66	5.653	<0.05
7	2-Minute Continuous Pad Kicking	53.33	3.01	5.65	56.00	1.26	2.26	3.322	<0.05
8	30-Second Alternating Roundhouse Kick (3-m Target Distance)	33.50	1.76	5.26	37.33	1.03	2.77	4.838	<0.05

Table = 2.571

Table 3 shows that the experimental group has an exceptionally good development in terms of professional physical fitness, specifically as follows [5]:

- **The 10-Second Left Roundhouse Kick.**

Through group 3, in the target of kicking the left foot round 10 seconds, the achievement has increased. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 21.33 \pm 0.82$ times < $\bar{X}_{A1} = 24.17 \pm 0.75$ times with an improvement $d = 2.84$ times. At the same time, the calculated t -value = 5.937 > table $t = 2.571$ at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- **The 10-Second Right Roundhouse Kick.**

Through group 3, in the target of kicking the right foot round of 10 seconds, the achievement has increased. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 21.00 \pm 0.89$ times < $\bar{X}_{A1} = 24.17 \pm 1.33$ times with an improvement $d = 3.17$ times. At the same time, the calculated t value = 4.842 > table $t = 2.571$ at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- **The 30-Second Left Straight Punch Test with Resistance Band**

With the target of 30s left-handed elastic punching, the achievement has increased strongly. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 62.67 \pm 1.51$ times < $\bar{X}_{A1} = 67.33 \pm 1.21$ times with an improvement $d = 4.66$ times. At the same time, the calculated t value = 5.813 > table $t = 2.571$ at the

probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- **The 30-Second Right Straight Punch Test with Resistance Band.**

With the target of 30 seconds of right-handed elastic punching, the achievement has developed well. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 63.67 \pm 1.51$ times < $\bar{X}_{A1} = 65.33 \pm 2.07$ times with an improvement $d = 1.66$ times. At the same time, the calculated t value = 5.000 > table t at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- **The 30-Second Rear-Hand Hook Punch Test with Resistance Band.**

With the target of punching the hook after the 30s elastic performance, the performance has improved very well. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 40.83 \pm 1.94$ times < $\bar{X}_{A1} = 43.50 \pm 1.87$ times with an improvement $d = 2.67$ times. At the same time, the calculated t value = 4.781 > table t at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- **The 30-Second Rear-Leg Roundhouse Kick Test with Resistance Band.**

With the target of kicking the back foot with a 30s elasticity, the performance has improved very well. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 21.50 \pm 1.38$ times < $\bar{X}_{A1}$

= 25.00 ± 1.41 times with an improvement $d = 3.50$ times. At the same time, the calculated t-value = $5.653 > t_{table}$ at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

- The target **2-Minute Continuous Pad Kicking**. Through group 3, in the target of 2 minutes of Lam Po kicks, the achievements have developed well. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 53.33 \pm 3.01$ times $< \bar{X}_{A1} = 56.00 \pm 1.26$ times with an improvement $d = 2.67$ times. At the same time, the calculated t value = $3.322 > t_{table} = 2.571$ at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.
- The target of **30-Second Alternating Roundhouse Kick (3-m Target Distance)**. Through group 3, in the target of kicking the 2-foot bridge 3m/2p from the finish, the achievement has good development. Specifically, the experimental group had a pre-experimental mean value $\bar{X}_A = 33.50 \pm 1.76$ times $< \bar{X}_{A1} = 37.33 \pm 1.03$ times with an improvement $d = 3.83$ times. At the same time, the calculated t-value = $4.838 > t_{table}$ at the probability threshold $P < 0.05$, showing a statistically significant difference between before and after one training cycle.

In general, the results of table 2 and table 3, through 01 training cycle, the indicators of the experimental group all had a significant increase $t_{in} > t_{table}$, the standard deviation around the average number was small with $C_v < 10\%$, ranging from 1.35% to 9.82% in table 2 and 2.36% to 6.41% in table 3, Cuneiform value with no excessive dispersion ensures statistically significant reliability according to a certain law at the probability threshold $P < 0.05$.

Thus: After a training cycle, the average value of 17/17 fitness tests of male athletes Vovinam in Binh Phuoc province have good growth. The growth means have a marked difference at the probability threshold of $P < 0.05$, as they are both $> t_{0.05} > 2.571$.

3. Conclusion

The study identified seventeen valid tests for evaluating the general and sport specific physical fitness of male athletes in the Binh Phuoc Vovinam Team [6]. Following one training cycle, statistically significant improvements were observed in all assessed physical fitness indicators ($P < 0.05$). These findings suggest that the implemented training program effectively enhanced athletes' physical performance and may serve as a useful framework for future coaching practice [2]. Future studies should include larger samples and longer follow-up periods to further validate these findings.

References

- [1] Aulic.I.V (1982), *Assessment of sports training level*, Sports Publishing House, Hanoi.
- [2] Duong Nghiep Chi (1991), *Sports Measurement*, Hanoi Sports Publishing House.
- [3] Tran Hoang Dung (2018), "Research to assess the physical fitness level of female athletes of the Vovinam youth team in Dong Nai province after 1 year of training". Master's thesis in Education, Ho Chi Minh City University of Sports, and Sports.
- [4] Tran Thi Kim Huong, Huynh Khac Nguyen (2022). "Assessment of Physical Fitness Status of Male Athletes of the Vovinam Youth Team in Ho Chi Minh City Age 16–17". Journal of Advances in Sports and Physical Education.
- [5] Nguyen Thi Thu Ngan (2024), *Assessment of the endurance status of male Karate team athletes aged 15-16 years old in Binh Phuoc province*. Proceedings of the National Scientific Research Conference on Physical Education and Sports of Colleges and Universities in 2024.
- [6] Tran Hong Quang et al. (2016), *Vovinam Curriculum*, Vietnam National University Publishing House, Ho Chi Minh City.
- [7] Nguyen Duc Van (2000), *Statistical Mathematical Methods in Sports and Sports*, Hanoi Sports Publishing House.