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## Evaluate of evolutionary endurance for works of applied of athletes of the People's Security Academy Viet Nam

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### Abstract

The results of the assessment of aerobic endurance athletes who recruits the People's Security Academy Vietnam show the difference in  $VO_2$  max and the rankings between experimental phases. The first step has shown the efficiency of developing endurance exercises for athletes of the People's Security Academy Vietnam applied martial arts team.

**Keywords:** evolution, aerobic endurance, athletes, applied martial arts, People's Security Academy, Vietnam

### Introduction

Understanding the importance of physical education for students, People's Security Academy Vietnam has implemented the regulations of the Ministry of Education and Training on the content of physical education programs in universities. The Ministry of Public Security has regulated the standards of physical training in the People's Public Security force in Circular 24/2013/TT-BCA dated April 11, 2013, which states: "Public Security academies and schools incorporating standard physical training content into the curriculum of physical education and sports for pupils and students". In 2013, the Ministry of Public Security issued the Regulation on martial arts competition applied in the people's police force. In which a match comprises 3 rounds, it played each round for 2 minutes, with a 1-minute break in between. The competition weight classes include 22 weight classes, 12 men's weight classes, 10 women's weight classes. The training strategy for martial arts application in the people's public security force shall be developed and disseminated from October 2017, with a total of 264 hours. In fact, through teaching and training at People's Security Academy, Viet Nam has noticed, the physical capacity of the students in general and the athletic team is not as expected, especially the strength, which has affected the results of the training and achievement of People's Security Academy Viet Nam. As a result, the development of the overall strength and aerobic strength for students, athletes in the People's Security Academy Viet Nam has a huge significance in improving the quality of training, the political leadership, the warrior's fight strength, the people's security strategy. Also help improve the content, fitness program, forecast, and track achievements in games. Aerobic resilience can be measured by oxygen volume consumed by the maximum capacity. The  $VO_2$  max index is the maximum amount of oxygen that the body can use in a minute per body weight. The higher the  $VO_2$  max values, the faster you can train with a higher intensity than the other runners. Therefore, assessing the evolution of aerobic endurance after each training period is essential for athletes of the People's Security Academy Vietnam applied martial arts team.

### Research Method

The research process uses methods: analytical methods and synthesis of documents, methods of interview, pedagogical methods, pedagogical methods, and statistical methods.

The experimental subjects were 25 athletes aged 20-21 from the People's Security Academy Vietnam applied martial arts team. The experimental process is applied to the development of the strength of the subject.

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Assessment of aerobic strength of athletes by VO<sub>2</sub> max (ml/kg/min) between three experimental periods (Phase 1 - Initial, Phase 2 - Mid-trial, and Phase 3 - End of the experiment).

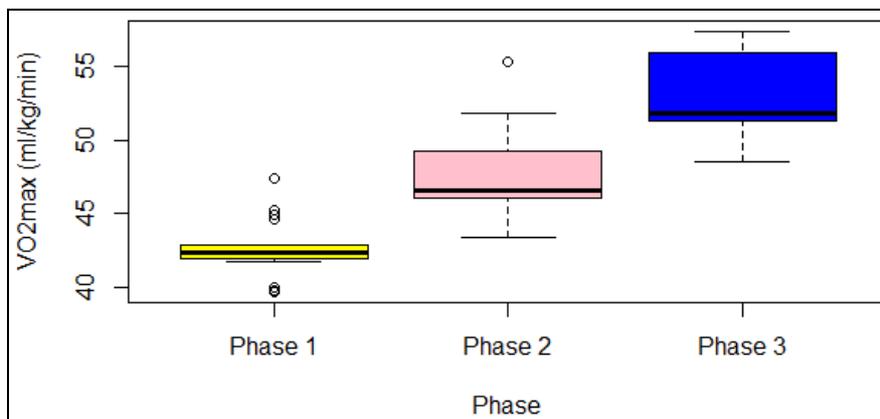
Using R software to calculate the characteristic parameters, paired t-test and Chi-Square test at each experimental time.

**Research Results and Discussion**

After the selection of the training exercises for the people's martial arts team People's Security Academy Viet Nam, the theme has applied to training practices for a year. The test results VO<sub>2</sub>max (ml/kg/min) obtained through the time of examination such as presented in table 1.

**Table 1:** VO<sub>2</sub>max indicators via experimental phase (n = 25)

NO	Stage	Min	1st Qu	Median	Mean	3rd Qu	Max	δ	Cv (%)
1	Phase 1	39.69	41.97	42.33	42.88	42.87	47.41	2.13	4.97
2	Phase 2	43.36	46.06	46.51	47.84	49.28	55.34	3.26	6.81
3	Phase 3	48.52	51.32	51.76	52.85	55.88	57.35	2.79	5.28



**Fig 1:** Distribution VO<sub>2</sub>max indicators via experimental phase

From the results obtained in table 1 show: the average value of the index vo<sub>2</sub> max has increased from phase 1 to phase 3, respectively, 42.88 → 47.84 → 52.85 ml/kg/min, and the coefficient of variation, respectively CV from 4.97 – 6.81 < 10%. The result shows that there is no dispersal of the VO<sub>2</sub> max index of among applied martial arts athletes, but the Median value in all 3 stages is smaller than the Mean value and thus most of the results are obtained. distribution at the bottom, the low area (as shown in chart 1).

According to the data classification according to Heywood

(2006) [2] standards, the mean value at phase 1 is 42.88 ml/kg/min of fair level, but phase 2 has increased to 47.84 ml/kg/min and at the excellent level, respectively. Thus, through the analysis of the mean and other specific parameters that have shown that the aerobic strength of people's security academy is enhanced by three training stages.

The meaning of the value difference is the VO<sub>2</sub>max and the difference between the phases presented in table 2.

**Table 2:** Comparison of the difference of VO<sub>2</sub> max index between experimental phase (n = 25)

No	Compare	Results	
		Mean of the differences	t
1	Phase 1-2	4.95	10.253***
2	Phase 2-3	5.01	11.681***
3	Phase 1-3	9.97	27.359***

Note: \* with P<0.05; \*\* with P<0.01; \*\*\* with P<0.001

The resulting result in table 2 shows: after the application of the aerobic energy development exercise, the value of the vo<sub>2</sub> max index between the phases is increasing. The meaning of the difference between phase 1 - 2 is 4.95 ml/kg/min and serial connection between phase 2 - 3 increase 5.01 ml/kg/min. When comparing phase 1 - 3 increased 9.97 ml/kg/min.

To assess the difference in the VO<sub>2</sub> max index between the experimental periods, the use of t-tests to compare the value t computed between the phases of 10. 253 - 27. 359 at p < 0. 001. In other words, the growth rate of VO<sub>2</sub> max between

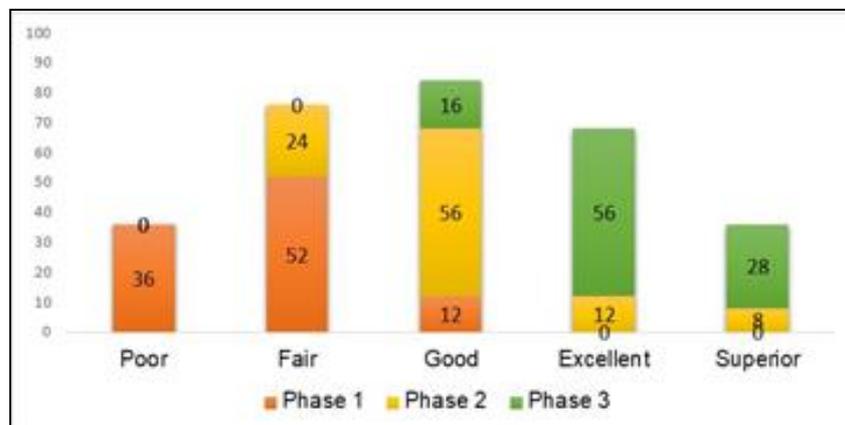
experimental stages is really different and statistically significant. So, the exercises that select the app have made a significant difference in developing aerobic endurance for athletes of the People's Security Academy Vietnam applied martial arts team.

To continue to clarify the efficiency of aerobic development for the 20 - 21 year - olds of the People's Security Academy Vietnam applied martial arts team, the data test data VO<sub>2</sub>max via training stages has been classified according to Heywood's Normative Data (2006). The resulting result is shown in table 3 and graph 2.

**Table 3:** The results of the index VO2 max according to the experimental phase (n = 25)

No	Type	Phase 1		Phase 2		Phase 3	
		n	%	n	%	n	%
1	Poor	9	36.0	0	0.0	0	0.0
2	Fair	13	52.0	6	24.0	0	0.0
3	Good	3	12.0	14	56.0	4	16.0
4	Excellent	0	0.0	3	12.0	14	56.0
5	Superior	0	0.0	2	8.0	7	28.0

X-squared = 69.783, df = 8, p-value = 5.428e-12

**Chart 2:** The ratio of VO2 max metric to experimental phases

The resulting result in table 3 shows: when comparing the index number VO2 max between three experimental stages through the Chi-Square test, the giá2 (X-squared) value is 69,783 with p-value = 5.428e-12 < 0.001. Thus, the rating of the VO2 max index between the three experimental periods is really different.

Performance representation on graph 2 shows: there is a change and increase in the rating ratio between experimental stages in the following phase better than the previous phase. The situation in the initial evaluation period (phase 1) is only 3 degrees from poor to good, where fair rates represent the rate of 52%, and the poor is 36% and thus the level of good or higher. But the rate in these two low levels fell in the middle of the (phase 2) experiment with poor 0% and fair down to 24%. And until the end of (phase 3), only three levels from good to superior, in which the great proportion is 56%, and superior accounting for 28%.

### Conclusion

Based on the value and ranking of the index of VO2 max, the growth trend has shown a marked growth trend and a better level of classification over experimental periods. Analysis and assessment have confirmed the effectiveness of the exercises selected by the topic to develop aerobic endurance for athletes of the People's Security Academy Vietnam applied martial arts team.

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