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Researching of selection tests on fitness for female gymnastic athletes of the age of 06 (Calculated by the bone age)

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Abstract
Basing on some selective science researches, gymnastic characteristics, references on selective science achievements of the countries in the world and tested application results in the practises. So that, we have selected 05 selected tests on physical fitness for female gymnastic athletes of the age of 06 (by the bone age).

Keywords: Selected tests, physical fitness, female athletes, gymnastics, bone age

Introduction
The gymnastic is the sport with complicated, difficult techniques that require the athletes to have convergence elements as: Fast, strong, durable, flexibility and balance. The physical fitness is one of basic factors and foundation to comprehend and delelop strange and difficult techniques. The selection of some athletes with good physical fitness to be suitable with professional management from the starting stage of training program, it is the key to have success for the training program. In this research, we have been found out a system of selection tests on physical fitness for Viet Nam female gymnastic athletes of the age of 06 (by bone age).

Methodology – Researching Organization
In order to determine a system of selection tests on physical fitness for Viet Nam female gymnastic athletes of the age of 06 in the research process. The theme has been using synthetic analysis method with some other relevant documents, interview method by cards, pedagogy testing method, and mathematical statistic method. The subjects to research consisting of 20 female gymnastic athletes of the age of 06 (calculated by bone age).

Results of Research
The selection of test system on physical fitness for female gymnastic athletes of the age of 06 (calculated by bone age).
The basis to select tests:
Practical basis: We had some references on the achievements of selection practices of the countries of the world and the works of Viet Nam such as:
By the research of Minaê HA (1981) with more 167 youth gymnastic athletes who have been applying these physical fitness tests: Runing with the speed of 20 meters at high starting point (by seconds), jumping away from the spot (by cm), up and down the hand with the horizontal bar (by times), climbing the rope by keeping perpendicular legs (by meter), hanging up high bar to lift perpendicular legs (by times), folding and stretching up the wall to support (by times), hanging the hands up high bar to roll prone the wall to support, lying on the stomach to push (by times), bending the body (by points), being flexible the shoulder (cm), splitting by vertical style (by points), splitting by horizontal style (by points).
By the researchs of Democratic Republic of Germany had given the tests related to physical fitness for gymnastic atheletes from 07 ~ 09 years old including: running 30m (by minutes), jumping away from the spot (by cm), up and down the hand with the horizontal bar (by times),

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In China – The books on selecting athletes (2011) was editted by Wang Jin-Shan and selected from the gymnastic athletes from 06 ~ 08 years old who have been appling the following physical fitness tests: Runing with the speed of 30 meters at high starting point (by seconds), jumping away from the spot (by cm), hanging the body up the ladder to making perpendicular legs for 30 minutes (by times), removing leg banana from cross legs style (by times) to apply for the athletes over 07 years old, blending the bridge to be applied with female athletes (by points), bending the body forward to be applied with male athletes (by cm).

In Vietnam, the author Le Van Lam (1994) has applied the following physical fitness tests in order to evaluate physical fitness level of young athletes for the initial training stage: Runing with the speed of 30 meters at high starting point, jumping away from the spot, jumping with high speet from the spot, lying on the stomach to push with hands as quick as possible, hanging and stretching the hands as quick as possible, keeping the style of ladder hanging to lift the legs to attach the wall, climbing the rope from sitting form, doing combined exercise for two times continously, bending the bridge, splitting the legs with vertical and horizontal style, turning the shoulders with the stick.

"The selection program for gymnastic athletes" was circulated internally and compiled for the coaches (1996) which applied the tests by Viet Nam Sports Committee as: lying on the stomach to push on gymnastic seat, lifting the legs to make perpendicular form on the ladder, hanging and shrinking the hands, running with the speed of 20m at the high spot, jumping away from the spot, hanging crossing by legs, bending the bridge, splitting the legs with vertical and horizontal style.

Scientific basis: We have been basing on the science of selection, characteristics of gymnastic, traits, anatomical-physiological by ages, growth rules (displayed at the overview part) as science base for selecting the tests by the most effective method.

Basing on the scientific basis and selection practices in Viet Nam and in abroad, we have selected and given 12 selection tests on physical fitness substance including: Running 30m (by minutes) and 60m (by minutes); jumping away from the spot (by cm); jumping with high speed from the spot (by cm); lying on the stomach to push, stretching the hands with single bar (by times); folding the bell by the ladder (by times); splitting vertical and horizontal style; blending the brigde (by cm); standing balance by one leg – as style of an independent girl (by minutes); keeping balance with bending style by one leg (by minutes).

Interviewing the expert: To selecting the tests objectively, efficiently and suitably with facility condition of Viet Nam. The researcher had som interviews with leading experts, coaches, lecturers of gymnastic department consisting of 50 persons. The results, tests of the interview with agreement votes over 70% with following tests:

To choose the test in an objective, efficient and consistent with the conditions of infrastructure of Vietnam, the subject has to interview the top industry experts, the coaches, teachers teach gymnastics, including 50 people. The interview results, the test has a number of votes agree on 70% for 05 tests: Running 30m (by minutes); Turn away from the spot (by cm); stretching the hands with single bar (by times); folding the bell by the ladder (by times); blending the brigde (by cm).

Testing the reliability of the tests: To test the reliability of the selection tests of physical fitness for gymnastic female athletes of 06 ages, we have conducted testing to 20 female athletes at the ages of 06 in Vietnam (calculated by the bone age). We divided into two times for testing, every time is separated by 05 days, the testing conditions between the two times are the same. And then, we have proceed to calculate the correlation coefficient of these contents between 2 times of testing and obtained the results in the Table 1.

Table 1: The correlation between 2 times of checking the selection tests on physical physical fitness for femal gymnastic athletes of the age of 06.

No	Test	r	P
1	Running 30m (by seconds)	0.95	< 0.01
2	Jumping away from the spot (by cm)	0.96	< 0.01
3	Stretching the hands with single bar (by times)	0.94	< 0.01
4	folding the bell by the ladder for 30 seconds (by times)	0.92	< 0.01
5	blending the brigde (by cm)	0.90	< 0.01

Through The Table 1 shows all physical fitnees tests bear r > 0.8. It demonstrates that the above mentioned tests with full reliability to use for physical fitness selection for female gymnastic athletes of the age of 6.

Testing the notification: To test the notification of physical fitness selection tests for female gymnastic athletes of the age of 6, we have proceed to calculate the correlation coefficient between the testing results of the tests with competition results to be rated by hierarchical corelation formula C. Spearman and the results obtained in the Table 2.

Table 2: The hierarchical correlation between physical fitness selection tests and competition results of female gymnastic atheletes of the age of 6.

No	Test	hierarchical correlation (r)
1	Running 30m (by seconds)	0.75
2	Jumping away from the spot (by cm)	0.72
3	Stretching the hands with single bar (by times)	0.86
4	Folding the bell by the ladder for 30 seconds (by times)	0.85
5	Blending the brigde (by cm)	0.85

The results of Table 2 indicates that these physical fitness tests have been showing a strong correlation with the competition results (r > 0.6). Therefore, it can be confirmed that these tests are sufficiently informative and feasible to be used for the selection of female gymnastic athelete of the age of 6.

Initial step for applying physical fitness selection test for female gymnastics atheletes of the age of 6 (based on the bone age)
Divide the atheletes into the group to study: Before testing, we grouped the atheletes. Basing on the training level, we divided the participants into two groups (the first group is excellent athletes, the second group is medium and good athletes) by evaluation criteria on level of female gymnastic atheletes of the age of 6 of the author Nguyen Kim Xuan 2011.

Testing the physical fitness of female gymnastic atheletes of the age of 6: We conducted to test by 05 selected physical fitness tests. The results are presented in the Table 3.

Table 3: The testing results on the physical fitness of female gymnastic atheletes of the age of 6

No	Test	Parameters	The age of 6	
			Group 1	**Group 2**
1	Running 30m (by seconds)	$\bar{X}_{\pm S}$	5.48±0.14	6.18±0.15
		t	5.83	
		p	0.001	
2	Jumping away from the spot (by cm)	$\bar{X}_{\pm S}$	167.65±2.7	154.75±4.44
		t	3.06	
		p	0.01	
3	Stretching the hands with single bar (by times)	$\bar{X}_{\pm S}$	14.7±0.66	11.15±1.02
		t	3.81	
		p	0.005	
4	Folding the bell by the ladder for 30 seconds (by times)	$\bar{X}_{\pm S}$	21.2±0.77	18.0±0.79
		t	4.21	
		p	0.001	
5	Blending the brigde (by cm)	$\bar{X}_{\pm S}$	5.13±0.46	10.1±0.91
		t	6.86	
		p	0.001	

The results of the Table 3 shows that

Test for running 30m (by second): the average value of the group 1 is 5.48 ± 0.14 (second), the group 2 is 6.18 ± 0.15 (second), tstudet = 5.83. The difference was statistically significant at the probability threshold p = 0.001. It shows that the group of excellent athletes are better than average athletes clearly.

Test for jumping away from the spot (by cm): It means that the average value of group 1 is 167.65 ± 2.7 (cm) better than the group 2 is 154.75 ± 4.44 (cm), t studet = 3.06. The difference was statistically significant at the probability threshold p = 0.01. It proves that the excellent athletes with jumping ability and fitness of lower parts are better better than the group of average athletes clearly.

Test for stretching the hands with single bar (by times): It means that the average value of group 1 was 14.7 ± 0.66 (times), group 2 was 11.15 ± 1.02 (times), t studet = 3.81. The difference was statistically significant at the probability threshold p = 0.005. It shows that the excellent athletes with jumping ability and fitness of upper parts are better better than the group of average athletes clearly.

Test for folding the bell by the ladder for 30 seconds (by timesh): It means that the average value of group 1 is 21.2 ± 0.77 (times), the group 2 is 18.0 ± 0.79 (time), tstudet = 4.21. The difference was statistically significant at the probability threshold p = 0.001. It shows that the excellent athletes are stronger better than the group of average athletes on back muscle and bell muscle clearly.

Test for blending the brigde (by cm): It means that the average value of group 1 is 5.13 ± 0.46 (cm), the group 2 was 10.1 ± 0.91 (cm), tstudet = 6.86. The difference was statistically significant at the probability threshold p = 0.001. It shows that the excellent athlete has more flexible substance than the group of average athletes. Further, It is also the test that shows the most difference between the two groups. Meanwhile, it proves that the flexible factor plays an important role to gymnastic.
However, it need to have concrete evaluation standard to understand more clearly the difference and physical fitness ability of each group. So, we will proceed to select the evaluation standard in the next step.

Selecting evaluation criteria: Basing on the morphological comparison and physical fitness characteristics of Vietnamese with other countries in the world. The theme has selected some countries that bear many similarities with Vietnam. I is China's evaluation criteria (as showed in the appendix). In order to ensure objectivity and science, the theme has conducted some interviews with national experts on the application of these evaluation criterias. The number of questionnaires consisting of 45 votes, the number of agreement votes 37/45 (equivalent 82.2%). China's evaluation criteria on physical fitness is divided into five levels and had maximum of 25 points, it is specifically shown in the Table 4. Comparing with the criteria to evaluate the mark and ranking levels by 5 level from 01 to 05: Level 5-Excellent; Level 4-Good; Level 3 – Well done; Level 2- Average; Level 1-weak.

Table 4: The selection criteria on physical fitness for female gymnastic atheletes of the age of 6

No	Test	1		2		3		4		5	
		Criteria	Mark	Criteria	Mark	Criteria	Mark	Criteria	Mark	Criteria	Mark
1	Running 30m (by seconds)	6"1~	1.0	5"9~	2.0	5"7~	3.0	5"5~	4.0	5"3~	5.0
2	Jumping away from the spot (by cm)	140~	1.0	150~	2.0	160~	3.0	168~	4.0	173~	5.0
3	Stretching the hands with single bar (by times)	6~	1.0	10~	2.0	13~	3.0	15~	4.0	17~	5.0
4	Folding the bell by the ladder for 30 seconds (by times)	15~	1.0	17~	2.0	19~	3.0	21~	4.0	23~	5.0
5	Blending the brigde (by cm)	20~	1.0	13~	2.0	8~	3.0	4~	4.0	0~	5.0

Vuong Kim Sang (2011), Seclection science for atheletes, People Sport Publishing Company, Beijing-translated by Nguyen Thi Gam

Basing on the evaluation criteria in the Table 4, we start assessing by each athlete's criteria. Then, we will synthesize and calculate the total of average scores for each test of the two groups to make the comparison. The evaluation results by mark are presented in the Table 5.

Table 5: The results of evaluation has been clasified the physical fitness for female gymnastic atheletes of the age of 6

No	Test	Group 1		Group 2	
		Mark	Classification	Mark	Classification
1	Running 30m (by seconds)	4	Good	2	Average
2	Jumping away from the spot (by cm)	4	Good	2.5	Average
3	Stretching the hands with single bar (by times)	4	Good	2.5	Average
4	Folding the bell by the ladder for 30 seconds (by times)	4	Good	2.5	Average
5	Blending the brigde (by cm)	3.8	Good	2.5	Average

The results in the Table 5 shows: The group 1 (excellent and good athletes), average physicall fitness at the level 4 (Good) and nobody is at excellent level. The atheletes of group 2 (medium and good), the average physical fitness only is at average level, nobody is at good level. It shows that the results of physical selection are quite similar to the evaluation results on athletes'level. However, the results also show that the evaluation criteria of China is relatively high comparing with Vietnam's athlete. It is necessary to develop the selection criteria of physical fitness for Vietnam in particular.

Making the evaluation criteria on physical finess for the selection of female gymnastic athletes of the age of 6 (basing on the bone age).
Basing on the results of physical examination of female gymnastic athletes of Viet Nam of the age of 6. We followed the principle ± 2S to develop an evaluation scale and evaluation results are presented in the Table 6.
The evaluation standard has been ranked by 05 levels from 01 to 05: Level 5-Excellent; Level 4- Good; Level 3 – Well done; Level 2- Average; Level 1-weak.

Table 6: The selection criteria on physical fitness for female gymnastic athletes of the age of 6 in VieNam (by the bone age)

No	Target (test)	Level									
		1		2		3		4		5	
		Standard	Mark	Standard	Mark	Standard	Mark	Standard	Mark	Standard	Mark
1	Running 30m (by seconds)	6"6~	1.0	6"4~	2.0	6"2~	3.0	6"~	4.0	5"8~	5.0
2	Jumping away from the spot (by cm)	135~	1.0	145~	2.0	155~	3.0	165~	4.0	175~	5.0
3	Stretching the hands with single bar (by times)	7~	1.0	9~	2.0	11~	3.0	13~	4.0	15~	5.0
4	Folding the bell by the ladder for 30 seconds (by times)	14~	1.0	16~	2.0	18~	3.0	20~	4.0	22~	5.0
5	Blending the brigde (by cm)	18~	1.0	14~	2.0	10~	3.0	6~	4.0	2~	5.0

Conclusion
Basing on the systemalization results, selected experiments of countries in the world, expert interviews, testability and reliability of test, the theme has selected 05 physical fitness tests to apply for the selection of female gymnastic atheletes of the ages of 6 including: Running 30m (by seconds); Jumping away from the sppt (cm); Stretching the hands with single bar (by times); Folding the bell by the ladder for 30 seconds (by times) and blending the bridge (by cm).
Basing on the physical fitness selection criteria of Chinese experts and basing on the real situation of physical fitness status of Vietnamese athletes. we have developed a physical

fitness selection standard for for the selection of female gymnastic atheletes of the ages of 6 by the bone age (presented in the Table 5).

In addition, the results of the research shows that the above mentioned 05 tests have also reflected the physical fitness requirements necessaryly and it played an important role female gymnastic athletes. Especially, it is the professional physical fitness tests as: Folding the bell by the ladder, stretching the hands with single bar and blending the bridge. It is also the important professional physical fitness manner and it bears the characteristic of female gymnastic atheletes, it need noticing to selecting female gymnastic atheletes.

References
1. Chen Ying. Researching on the selection criterias for gymnastic athletes for the initial selection stage, Sports Science Newspaper, Beijing Sport Publishing House, 2009.
2. Liao Ji, Lin Li, Jiang Yun. Researching on the selection criteria for female gymnastic athletes at the initial stage, Sports Science Newspaper, Beijing Sport Publishing House, 1994.
3. Liu Bang Hua. Discussing on the selection for physical fitness manner of young gymnastic athletes. Anhui Sporting Games, Anhui Sporting Goods, 2006.
4. Trinh Hung Thanh, Le Nguyet Nga. Basic biology and Sports Talent Development, Sports Publishing House, Ha Noi, 1993.
5. Zhang Chun Fu. Discussion on the science selection of gymnastic athletes of the newspaper of Shandong Teacher Training College. Publishing House of Shandong Teaching University, 2001.