

First Submitted: 19 January 2024 / Accepted: 31 January 2024

DOI: <https://doi.org/10.61707/vqnyh017>

# Application of Some Physical Education and Physical Training Models for Physical Fitness Development Among Primary School Students in Thanh Hoa Province, Vietnam

Dr. Dong Huong Lan<sup>1</sup>

## Abstract

*Physical education activities in primary schools in Thanh Hoa province are strictly carried out under the direction and guidance of the Department of Education and Training, Divisions of Education and Training of districts and towns. Physical education classes consist of in-class hours and extracurricular sports activities. Many schools have organized classes or clubs for extracurricular activities to create a healthy playground, helping students to promote their talents and fortes. However, these clubs are established according to a spontaneous model, resulting in the limited number of participating students and irregular attendance. In addition, they have not received enthusiastic support from parents. Research on physical fitness development for students in general and primary school students in Thanh Hoa province, Vietnam is currently a very necessary and important task. Based on the evaluation of the current situation of extracurricular physical training, physical qualities of students, the research process has selected and applied some physical training models to develop physical fitness for primary school students in Thanh Hoa province, Vietnam.*

**Keywords:** *Physical Qualities, Physical Training Model, Physical Fitness Development, Primary School Students.*

## INTRODUCTION

Primary school is the foundation level of the national education system, responsible for equipping students with the basic knowledge of the level to continue studying at higher levels, helping them form the basics of personality. Therefore, research on physical fitness development for students in general and primary school students in Thanh Hoa province, Vietnam is currently a very necessary and important task. In 2016, the Prime Minister signed Decision No. 1076/QĐ-TTg dated June 17, 2016, approving the overall project on the development of physical education and school sports for the period 2016 - 2020, with an orientation to 2025 (Prime Minister (2016), *Decision No. 1076/QĐ-TTg dated June 17*). And Decision No. 641/QĐ-TTg dated April 28, 2011 of the Prime Minister approving the overall project on the development of physical fitness, stature of Vietnamese people for the period 2011- 2030 (Prime Minister 2011, *Decision No. 641/QĐ-TTg dated April 28*).

The issue raised is that primary schools need to build and apply extracurricular physical training models that operate regularly, ensuring the principle of organizing education with social characteristics, operating with the purpose of educating and training people in the field of physical education and sports, contributing to building a comprehensively developed person, improving and enhancing physical qualities for students.

In our country, the authors have researched many topics in the fields of organization, management, content, forms, methods of physical education, health of students in general schools at all levels, including research works on physical education for primary school students, typically research works include as follows:

In 2001, the Vietnam Sport Science Institute in collaboration with universities and colleges of physical education and sports nationwide conducted the "*Survey to assess physical condition and develop a common physical fitness standard system of Vietnamese people aged 6-20 years*" on a large scale with the number of 5,289 participants from 22 provinces and cities. The results show that the trend of increasing height and weight is increasing in primary school students from 6 -10 years old, the development of physical qualities develops unevenly right in each age, there is a difference in physical fitness development of primary students in urban and rural areas. Compared with the physical fitness of children in some other countries such as China, Japan, Thailand, Singapore, Indonesia, the physical fitness

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<sup>1</sup> Thanh Hoa University of Culture, Sports and Tourism, Vietnam. E-mail: [donghuonglan@dvttdt.edu.vn](mailto:donghuonglan@dvttdt.edu.vn)

of Vietnamese people from 6 - 20 years old is generally inferior in terms of height, weight, strength and endurance, while speed, dexterity and flexibility are equivalent... (Vietnam Sports Science Institute, 2003, *Physical situation of Vietnamese people from 6 to 20 years old*).

Ministry-level scientific and technological work: “*Research on the physical fitness development of general students from grade 1 to grade 12 (from 2002 to 2013)*” has evaluated the evolution of physical fitness development for students by the method of longitudinal observation throughout 12 years (from 6 to 17 years old - students from grade 1 to grade 12) in provinces (cities): For primary school students, research in Hanoi, Bac Giang, Bac Ninh, Ha Giang, Da Nang, Quang Nam, Quang Ngai, Ho Chi Minh City, Binh Duong, Tay Ninh; for junior high school and high school students, research in Hanoi, Bac Giang, Bac Ninh, Ha Giang (Tran Duc Dung, 2010).

The research work “*Research on the physical fitness development of specialized general high school students in the Northern Central provinces*” (Nguyen Duc Van 2001), has conducted an evaluation of the morphological, functional, physical qualities indices of specialized general students developed according to the law, at the same time built appropriate solutions with the characteristics of specialized general schools about: environment, time, space, psychological characteristics, cognition, thinking, sports needs and guarantee conditions; meeting the purpose, requirements, training content of the school; forming in students the necessary abilities in studying physical education subjects and bringing better learning efficiency as well as for the physical fitness development of students of specialized general schools in the Northern Central region (Dong Huong Lan - 2016).

The above research results are all very valuable documents in the field of physical education in general and the work of physical fitness development in particular for primary students. However, no scientific work has been seen to deeply solve issues such as organizing play in primary schools; or the synchronous conditions of Vietnamese primary schools to implement physical education, comprehensive development for primary students, to meet the urgent needs of the current reality and for the coming years.

The research process has used research methods: Methods of analysis and synthesis of documents, survey methods, expert methods, anthropometric methods, pedagogical tests, pedagogical experiments and mathematical statistical methods to evaluate the status of extracurricular activities, physical qualities of students, and select extracurricular physical training models for the research subjects.

## **RESEARCH RESULTS AND DISCUSSION**

### ***1. Current situation of extracurricular physical training activities in primary schools in Thanh Hoa province, Vietnam***

#### *- Current situation of extracurricular sports training*

Extracurricular sports training in primary schools in Thanh Hoa province, Vietnam shows that very few primary schools are interested in implementing the extracurricular program regularly, the whole province has 324/716 primary schools (accounting for 45.25%) implementing the extracurricular sports training program irregularly. (People's Committee of Thanh Hoa Province, 2020, *Plan No. 134/KH – UBND dated June 17*; People's Committee of Thanh Hoa Province, 2020, *Plan No. 151/BC – UBND dated September 22*).

#### *- Regarding the needs of extracurricular training of primary school students*

Survey on the status of sports often participating in extracurricular training, forms and needs of students who want to participate in extracurricular sports training if organized by the school. The topic surveyed on 450 students, the results are presented in Table 1.

**Table 1. Interview results of students on the needs and forms of participation in extracurricular sports training (n = 450)**

No.	Contents	Interview results	
		N	%
1.	<b>Extracurricular training sports</b>		
	Football	178	<b>39.56</b>
	Aerobic fitness	276	<b>61.33</b>
	Table tennis	137	<b>30.44</b>
	Vovinam	268	<b>59.56</b>
	Chess	135	<b>30.00</b>
	Shuttlecock kicking	198	<b>44.00</b>
	Badminton	176	<b>39.11</b>
	Swimming	246	<b>54.67</b>
	Athletics	126	<b>28.00</b>
	Basketball	168	<b>37.33</b>
Other sports	18	<b>4.00</b>	
2.	<b>Forms of participation in extracurricular training</b>		
	Self-training	146	<b>32.44</b>
	Group training	212	<b>47.11</b>
	Talent class training	24	<b>5.33</b>
	Team training	42	<b>9.33</b>
	Club training	26	<b>5.78</b>
3.	<b>Need to participate in extracurricular club training</b>		
	Really want.	330	<b>73.33</b>
	Normal.	101	<b>22.44</b>
	Not necessary.	17	<b>4.22</b>

The results presented in Table 1 show:

In terms of regular extracurricular sports, their training needs are shown for 10 subjects. Among them, there are 3 sports: table tennis, athletics, chess with the number of students regularly practicing accounting for a lower proportion; the second group includes sports: shuttlecock kicking, football, badminton, basketball with a higher proportion of students practicing but still low (proportion below 45.00%). The highest proportion is the group of sports: aerobics, vovinam and swimming have more students preferring to practice, accounting for 61.33%, 59.56% and 54.67%, respectively. (People's Committee of Thanh Hoa Province, 2020, *Plan No. 134/KH – UBND dated June 17*).

Regarding the form of participation in training: Most students participate in extracurricular sports training in the form of self-training (accounting for 32.44%) or self-training in groups (accounting for 47.11%), while with the number of 9.33% of students participating in extracurricular training in the form of school sports teams.

The results in Table 3 also show that schools rarely organize extracurricular training forms according to the model of talent classes (accounting for 5.33%), or sports clubs (accounting for 5.78%) for students. Therefore, to improve the quality of physical education in schools, it is necessary to build a model of organization, management of extracurricular sports training movement to attract the number of students to practice regularly. (People's Committee of Thanh Hoa Province, 2020, *Plan No. 151/BC – UBND dated September 22*).

Regarding the need to participate in the training according to various forms, sports clubs with teacher guidance are highly rated by students, the number of questionnaires wishing to participate accounts for up to 73.33%.

## **2. Physical status of primary students in Thanh Hoa province, Vietnam**

The research process has organized tests and evaluations of the physical fitness development status of primary students at some primary schools in Thanh Hoa province. The test evaluation contents are the criteria, tests evaluating the physical qualities of Vietnamese people from 6 to 60 years old in early 21<sup>st</sup> century (documents serving the implementation of the overall project on the development of physical fitness, stature of Vietnamese people for the period 2011 - 2030), specifically:

- Morphological and functional indices include: Standing height (cm); weight (kg); Quetelet index (g/cm); BMI index (kg/m<sup>2</sup>); cardiac function index (HW).

- General physical fitness tests include: Dominant hand grip strength (kg); sit-up (times/30s); Standing long jump (cm); 30m high start sprint (s); Trunk flexibility (cm); shuttle run 4 x 10m □ (s); Endurance run in 5 minutes (m).

The results are as shown in tables 2 and 3.

**Table 2. Physical fitness status (in terms of morphology and function) of primary school students in Thanh Hoa province (n = 450)**

Criteria		Standing height (cm)		Weight (kg)		Quetelet index (g/cm)		BMI (kg/m2)		Cardiac Function Index (HW)	
		$\bar{X}$	Satisfactory student rate (%)	$\bar{X}$	Satisfactory student rate (%)	$\bar{X}$	Satisfactory student rate (%)	$\bar{X}$	Satisfactory student rate (%)	$\bar{X}$	Satisfactory student rate (%)
Grade 1 (6 years old)	Male	114.83	66.16	22.33	61.32	186.33	59.24	15.55	60.31	12.68	65.03
	Female	113.14	70.21	18.08	59.21	160.44	63.43	14.08	59.09	12.94	70.1
Grade 2 (7 years old)	Male	118.72	68.45	24.56	61.13	201.75	61.25	16.31	59.86	12.70	66.45
	Female	118.85	71.3	24.41	66.15	200.33	63.62	16.72	61.07	12.97	69.01
Grade 3 (8 years old)	Male	124.11	68.54	26.54	62.41	208.80	63.25	16.43	60.28	12.42	65.06
	Female	123.38	70.03	26.01	65.15	210.81	64.52	17.09	62.15	12.77	68.45
Grade 4 (9 years old)	Male	129.96	69.23	28.54	62.21	219.61	61.51	16.90	61.65	11.78	62.52
	Female	129.56	71.05	28.83	64.71	221.65	64.4	17.65	63.32	11.95	61.84
Grade 5 (10 years old)	Male	135.33	71.13	32.84	64.25	235.70	61.43	16.92	58.89	10.72	66.06
	Female	134.56	70.54	31.12	65.06	233.00	62.08	17.45	62.08	10.93	67.12
<b>Average</b>			<b>69.66</b>		<b>63.16</b>		<b>62.47</b>		<b>60.87</b>		<b>66.16</b>

**Table 3. Physical fitness status (in terms of general physical fitness) of primary school students in Thanh Hoa province (n = 450)**

Criteria		Dominant hand grip strength (kg)		Sit-up (30 times/30s)		30m high start sprint (s)		Trunk flexibility (cm)		Shuttle run 4 □ 10m(s)		Standing long jump (cm)		Endurance run in 5 minutes (m)	
		$\bar{X}$	Satisfactory student rate (%)	$\bar{X}$	Satisfactory student rate (%)	$\bar{X}$	Satisfactory student rate (%)	$\bar{X}$	Satisfactory student rate (%)	$\bar{X}$	Satisfactory student rate (%)	$\bar{X}$	Satisfactory student rate (%)	$\bar{X}$	Satisfactory student rate (%)
Grade 1 (6 years old)	Male	9.53	56.67	10.77	55.13	7.18	55.67	3.15	56.67	13.9	59.67	114.46	60.07	666.17	47.17
	Female	9.24	53.33	10.37	57.33	7.95	57.65	3.97	55.17	14.83	58.33	108.93	57.33	640.24	43.23
Grade 2 (7 years old)	Male	11.56	60.17	11.28	60.03	6.81	59.07	3.61	58.66	13.28	56.77	125.9	58.77	725.44	48.16
	Female	10.88	55.83	10.98	59.12	7.38	57.67	3.93	60.07	14.17	53.13	118.12	57.13	699	49.03
Grade 3 (8 years old)	Male	13.59	54.67	13.04	56.33	6.41	60.07	4.31	57.67	13.06	57.27	135.45	56.27	783.12	49.07
	Female	12.17	53.83	12.78	56.81	6.95	58.67	4.83	55.86	13.66	58.03	128.33	60.03	719.68	50.03
Grade 4 (9 years old)	Male	15.22	61.07	15.44	59.33	6.18	56.16	4.52	57.67	12.33	57.37	141.05	57.87	810.23	47.57
	Female	13.89	58.33	14.68	58.63	6.81	56.17	4.52	59.17	13.15	54.53	133.82	55.93	735.59	46.03
Grade 5 (10 years old)	Male	17.12	54.67	15.84	60.72	6.02	59.07	5.08	56.16	11.98	60.07	155.23	60.37	835.11	46.67
	Female	16.16	57.33	15.59	58.81	6.53	57.66	5.35	58.06	12.78	58.13	143.28	56.68	753.58	47.13
<b>Average</b>			<b>56.59</b>		<b>58.22</b>		<b>57.79</b>		<b>57.52</b>		<b>57.33</b>		<b>58.05</b>		<b>47.41</b>

From the results obtained in tables 2 and 3 show:

**In terms of morphology and function:** Regarding morphology and function: The average indices of morphology and function of primary students in Thanh Hoa province are similar or higher compared to the physical fitness of Vietnamese people of the same age in early 21<sup>st</sup> century. However, the development rate of the indices of morphology and function of the research subjects is not uniform, and the average proportion of students meeting the requirements in the contents is only: standing height (69.66%), weight (63.16%), Quetelet index (62.47%), BMI index (60.87%), cardiac function index (66.16%).

**In terms of physical qualities:** The test results show that the general physical fitness of primary students in Thanh Hoa province is similar to the physical qualities of Vietnamese people of the same age in early 21<sup>st</sup> century. The development rate of the indices is more uniform, however, the proportion of students meeting the requirements in the contents is generally not high. Specifically: the number of students meeting the standard of high strength is quite high: upper limb strength (dominant hand grip strength) averages 56.59%, lower limb strength (standing long jump) averages 58.05%; the number of students meeting the speed standard (30m high start sprint) averages 57.79%, fast running skill (shuttle run) averages 57.33%; sit-up averages 58.22%, trunk

flexibility averages 57.52; the number of students meeting the endurance standard is low (endurance run in 5 minutes) averages only 47.41%.

## **APPLICATION OF SOME PHYSICAL TRAINING MODELS TO DEVELOP PHYSICAL FITNESS FOR PRIMARY SCHOOL STUDENTS IN THANH HOA PROVINCE, VIETNAM**

### ***Organization and Implementation of the Experimental Model***

- *Scope*: Implement school sports clubs for all grades (from grade 1 to grade 5), including 300 students. In which, each school has 100 students (Each grade has 20 students: 10 boys and 10 girls) belonging to 03 primary schools of Thanh Hoa province.

- *Units/sports applied in the form of clubs*:

+ Tho Xuan District (Lam Son town primary school): Aerobic exercise. Training time: 60 afternoon sessions (duration of 2 sessions/1 week □ 120 periods, each session 2 periods □ 70 minutes).

+ Cam Thuy District (Cam Son primary school): Aerobic exercise. Training time: 60 afternoon sessions (duration of 2 sessions/1 week □ 120 periods, each session 2 periods □ 70 minutes).

+ Hoang Hoa District (Hoang Thanh primary school): Swimming and Vovinam martial arts. Where:

Swimming: Training time: 30 afternoon sessions (duration of 2 sessions/1 week □ 60 periods, each session 2 periods □ 70 minutes).

Vovinam martial arts: Training time: 30 afternoon sessions (duration of 2 sessions/1 week □ 60 periods, each session 2 periods □ 70 minutes).

When determining the effectiveness of the selected solutions on the physical fitness development of primary students in Thanh Hoa province, the research process is based on the following criteria:

The results of testing 12 criteria, tests evaluating the physical qualities of Vietnamese people from 6 to 60 years old in early 21<sup>st</sup> century, and comparing and referencing through the contents of regulations on evaluation, ranking of physical fitness of students issued by the Ministry of Education and Training (Decision No. 53/2008/QĐ-BGDĐT dated September 18, 2008 on issuing regulations on evaluation, ranking of physical fitness of students).

Before conducting pedagogical experiments, the research process conducts tests, evaluates and ranks professional levels and physical qualities, general physical level according to current regulations of the Ministry of Education and Training, thereby serving as a basis for comparing the results of post-experimental evaluation tests.

After the end of the experimental process, the research process conducts tests and evaluations on the experimental subjects about physical qualities, physical level according to current regulations of the Ministry of Education and Training, thereby comparing with the results of pre-experimental tests.

### **Model Application Result**

To evaluate the effectiveness of the physical training model applied to develop physical fitness for students, the research process conducts tests and evaluations of physical qualities and physical level according to the current regulations of the Ministry of Education and Training, thereby comparing with the test results before the experiment of the research subjects. (Ministry of Education and Training, 2008, *Decision No. 53/2008/QĐ-BGDĐT dated September 18*).

The results obtained are presented in Tables 4 to 8.

**Table 4. Results of testing and evaluating the development of physical fitness before and after the experiment of primary school students in Thanh Hoa province, Grade 1 (6 years old)**

No.	Test content(male = 30, female = 30)	Gender	Test result ( $\bar{x} \pm \delta$ )				Difference		Growth pace (W%)
			Before the experiment		After the experiment		t	P	
			TBC	DLC	TBC	DLC			
1	Standing height (cm)	Male	114.32	5.68	118.95	8.49	<b>6.326</b>	>0.05	<b>3.970</b>
		Female	113.36	4.32	117.98	8.42	<b>6.068</b>	>0.05	<b>3.989</b>
2	Weight (kg)	Male	22.38	2.56	23.52	1.68	<b>5.198</b>	>0.05	<b>4.964</b>
		Female	22.42	2.52	23.56	1.68	<b>4.676</b>	>0.05	<b>4.954</b>
3	Quetelet index (g/cm)	Male	195.94	21.29	197.75	14.12	<i>0.991</i>	>0.05	<b>0.921</b>
		Female	197.66	19.65	199.69	14.26	<i>1.041</i>	>0.05	<b>1.022</b>
4	BMI (kg/m <sup>2</sup> )	Male	17.19	2.13	16.62	1.19	<b>3.261</b>	>0.05	<b>3.369</b>
		Female	17.45	1.75	16.93	1.21	<b>3.064</b>	>0.05	<b>3.049</b>
5	Cardiac function Index (HW)	Male	12.74	0.56	12.47	0.89	<b>3.636</b>	>0.05	<b>2.173</b>
		Female	13.13	0.74	12.85	0.92	<b>2.983</b>	>0.05	<b>2.224</b>
6	Dominant hand grip strength (kg).	Male	9.40	0.53	9.84	0.70	<b>6.975</b>	<0.05	<b>4.583</b>
		Female	9.33	0.64	9.76	0.70	<b>5.640</b>	<0.05	<b>4.477</b>
7	Sit-up (times/30s).	Male	10.10	0.62	10.63	0.76	<b>7.575</b>	<0.05	<b>5.144</b>
		Female	10.10	0.39	10.64	0.76	<b>7.889</b>	<0.05	<b>5.211</b>
8	30m high start sprint (s).	Male	7.15	0.29	6.96	0.50	<b>4.668</b>	<0.05	<b>2.727</b>
		Female	7.93	0.50	7.72	0.55	<b>3.493</b>	<0.05	<b>2.675</b>
9	Trunk flexibility (cm)	Male	3.20	0.17	3.37	0.24	<b>8.076</b>	<0.05	<b>5.154</b>
		Female	4.02	0.52	4.23	0.30	<b>4.415</b>	<0.05	<b>5.192</b>
10	Shuttle run 4 x 10m (s).	Male	13.92	0.44	13.54	0.97	<b>4.983</b>	<0.05	<b>2.758</b>
		Female	14.99	0.78	14.58	1.04	<b>3.874</b>	<0.05	<b>2.737</b>
11	Standing long jump (cm).	Male	114.70	4.34	119.72	8.55	<b>7.316</b>	<0.05	<b>4.286</b>
		Female	109.80	4.35	114.63	8.18	<b>6.490</b>	<0.05	<b>4.305</b>
12	Endurance run in 5 minutes (m).	Male	666.02	21.55	701.38	50.08	<b>9.059</b>	<0.05	<b>5.173</b>
		Female	648.72	27.90	677.01	48.34	<b>6.309</b>	<0.05	<b>4.267</b>

**Table 5. Results of testing and evaluating the development of physical fitness before and after the experiment of primary school students in Thanh Hoa province, Grade 2 (7 years old)**

No.	Test content(male = 30, female = 30)	Gender	Test result ( $\bar{x} \pm \delta$ )				Difference		Growth pace (W%)
			Before the experiment		After the experiment		t	P	
			TBC	DLC	TBC	DLC			
1	Standing height (cm)	Male	118,15	7,52	122,94	8,78	<b>5,781</b>	>0,05	<b>4,066</b>
		Female	117,88	5,43	122,67	8,76	<b>5,796</b>	>0,05	<b>4,018</b>
2	Weight (kg)	Male	25,09	5,22	26,37	1,88	<b>3,215</b>	>0,05	<b>5,002</b>
		Female	24,39	4,03	25,63	1,83	<b>3,485</b>	>0,05	<b>4,992</b>
3	Quetelet index (g/cm)	Male	211,54	32,99	214,51	15,32	<i>1,141</i>	>0,05	<b>1,338</b>
		Female	206,34	26,26	208,95	14,92	<i>1,075</i>	>0,05	<b>1,265</b>
4	BMI (kg/m <sup>2</sup> )	Male	17,89	2,18	17,45	1,25	<b>2,447</b>	>0,05	<b>2,641</b>
		Female	17,47	1,68	17,03	1,22	<b>2,650</b>	>0,05	<b>2,581</b>
5	Cardiac function Index (HW)	Male	12,51	0,64	12,24	0,87	<b>3,471</b>	>0,05	<b>2,143</b>
		Female	12,91	0,59	12,63	0,90	<b>3,211</b>	>0,05	<b>2,204</b>
6	Dominant hand grip strength (kg).	Male	11,31	2,11	11,84	0,85	<b>3,255</b>	<0,05	<b>4,583</b>
		Female	10,73	1,61	11,22	0,80	<b>3,407</b>	<0,05	<b>4,458</b>
7	Sit-up (times/30s).	Male	10,90	0,51	11,48	0,82	<b>8,343</b>	<0,05	<b>5,135</b>
		Female	10,85	0,50	11,43	0,82	<b>7,552</b>	<0,05	<b>5,182</b>
8	30m high start sprint (s).	Male	6,76	0,36	6,57	0,47	<b>4,281</b>	<0,05	<b>2,737</b>
		Female	7,33	0,41	7,13	0,51	<b>3,683</b>	<0,05	<b>2,686</b>
9	Trunk flexibility (cm)	Male	3,66	0,30	3,85	0,27	<b>6,647</b>	<0,05	<b>5,163</b>
		Female	3,92	0,47	4,13	0,30	<b>4,701</b>	<0,05	<b>5,173</b>
10	Shuttle run 4 x 10m (s).	Male	13,39	0,46	13,02	0,93	<b>4,896</b>	<0,05	<b>2,768</b>
		Female	14,04	0,43	13,66	0,98	<b>4,430</b>	<0,05	<b>2,747</b>
11	Standing long jump (cm).	Male	124,97	7,27	130,44	9,31	<b>6,469</b>	<0,05	<b>4,267</b>
		Female	115,03	5,02	120,09	8,57	<b>6,343</b>	<0,05	<b>4,324</b>
12	Endurance run in 5 minutes (m).	Male	727,41	48,23	758,76	54,18	<b>6,036</b>	<0,05	<b>4,219</b>
		Female	684,67	23,68	714,53	51,02	<b>6,608</b>	<0,05	<b>4,238</b>

**Table 6. Results of testing and evaluating the development of physical fitness before and after the experiment of primary school students in Thanh Hoa province, Grade 3 (8 years old)**

No.	Test content(male = 30, female = 30)	Gender	Test result ( $\bar{x} \pm \delta$ )				Difference		Growth pace (W%)
			Before the experiment		After the experiment		t	P	
			TBC	DLC	TBC	DLC			
1	Standing height (cm)	Male	124,16	11,21	128,94	9,21	<b>4,601</b>	>0,05	<b>3,777</b>
		Female	121,96	8,63	126,68	9,04	<b>4,699</b>	>0,05	<b>3,797</b>
2	Weight (kg)	Male	26,38	5,31	27,73	1,98	<b>3,310</b>	>0,05	<b>4,983</b>
		Female	25,71	4,42	27,01	1,93	<b>3,371</b>	>0,05	<b>4,973</b>
3	Quetelet index (g/cm)	Male	212,08	27,97	215,03	15,35	<i>1,291</i>	>0,05	<b>1,400</b>
		Female	210,61	25,33	213,24	15,23	<i>1,107</i>	>0,05	<b>1,259</b>
4	BMI (kg/m <sup>2</sup> )	Male	17,08	1,68	16,68	1,19	<b>2,741</b>	>0,05	<b>2,372</b>
		Female	17,27	1,62	16,83	1,20	<b>2,726</b>	>0,05	<b>2,567</b>
5	Cardiac function Index (HW)	Male	12,35	0,68	12,08	0,86	<b>3,377</b>	>0,05	<b>2,184</b>
		Female	12,66	0,45	12,39	0,88	<b>3,412</b>	>0,05	<b>2,194</b>
6	Dominant hand grip strength (kg).	Male	13,72	4,37	14,36	1,03	<b>2,000</b>	<0,05	<b>4,544</b>
		Female	12,26	2,94	12,82	0,92	<b>2,271</b>	<0,05	<b>4,449</b>
7	Sit-up (times/30s).	Male	12,77	1,74	13,44	0,96	<b>4,728</b>	<0,05	<b>5,163</b>
		Female	12,87	1,69	13,56	0,97	<b>4,408</b>	<0,05	<b>5,220</b>
8	30m high start sprint (s).	Male	6,43	0,47	6,26	0,45	<b>3,735</b>	<0,05	<b>2,747</b>
		Female	6,96	0,28	6,77	0,48	<b>4,082</b>	<0,05	<b>2,665</b>
9	Trunk flexibility (cm)	Male	4,27	0,65	4,49	0,32	<b>4,330</b>	<0,05	<b>5,173</b>
		Female	4,83	0,93	5,08	0,36	<b>3,201</b>	<0,05	<b>5,211</b>
10	Shuttle run 4 x 10m (s).	Male	13,18	0,55	12,82	0,92	<b>4,683</b>	<0,05	<b>2,716</b>
		Female	13,64	0,53	13,27	0,95	<b>4,216</b>	<0,05	<b>2,727</b>
11	Standing long jump (cm).	Male	135,45	13,26	141,38	10,09	<b>4,971</b>	<0,05	<b>4,277</b>
		Female	127,90	8,49	133,53	9,53	<b>5,488</b>	<0,05	<b>4,324</b>
12	Endurance run in 5 minutes (m).	Male	786,45	64,02	820,35	58,57	<b>5,455</b>	<0,05	<b>4,209</b>
		Female	723,95	46,74	755,51	53,94	<b>5,506</b>	<0,05	<b>4,257</b>



**Table 7. Results of testing and evaluating the development of physical fitness before and after the experiment of primary school students in Thanh Hoa province, Grade 4 (9 years old)**

No.	Test content(male = 30, female = 30)	Gender	Test result ( $\bar{x} \pm \delta$ )				Difference		Growth pace (W%)
			Before the experiment		After the experiment		t	P	
			TBC	DLC	TBC	DLC			
1	Standing height (cm)	Male	130,90	17,19	135,28	9,66	<b>3,106</b>	>0,05	<b>3,295</b>
		Female	129,12	15,74	133,47	9,53	<b>2,945</b>	>0,05	<b>3,314</b>
2	Weight (kg)	Male	28,08	8,10	29,51	2,11	<b>2,385</b>	>0,05	<b>5,002</b>
		Female	28,12	6,82	29,54	2,11	<b>2,491</b>	>0,05	<b>4,964</b>
3	Quetelet index (g/cm)	Male	213,90	44,01	218,11	15,57	<i>1,258</i>	>0,05	<b>1,986</b>
		Female	217,46	32,18	221,35	15,80	<i>1,351</i>	>0,05	<b>1,783</b>
4	BMI (kg/m <sup>2</sup> )	Male	16,31	2,98	16,12	1,15	<i>0,837</i>	>0,05	<b>1,144</b>
		Female	16,85	1,81	16,58	1,18	<i>1,527</i>	>0,05	<b>1,577</b>
5	Cardiac function Index (HW)	Male	11,78	1,08	11,52	0,82	<b>2,610</b>	>0,05	<b>2,143</b>
		Female	11,96	0,91	11,71	0,84	<b>2,597</b>	>0,05	<b>2,173</b>
6	Dominant hand grip strength (kg).	Male	15,32	5,95	16,22	1,16	<b>2,077</b>	<0,05	<b>5,722</b>
		Female	14,08	4,73	14,90	1,06	<b>2,092</b>	<0,05	<b>5,618</b>
7	Sit-up (times/30s).	Male	15,07	2,94	15,86	1,13	<b>3,528</b>	<0,05	<b>5,135</b>
		Female	14,80	2,61	15,59	1,11	<b>3,470</b>	<0,05	<b>5,220</b>
8	30m high start sprint (s).	Male	6,14	0,62	5,98	0,43	<b>3,078</b>	<0,05	<b>2,737</b>
		Female	6,75	0,23	6,58	0,47	<b>4,252</b>	<0,05	<b>2,686</b>
9	Trunk flexibility (cm)	Male	4,63	0,82	4,87	0,35	<b>3,830</b>	<0,05	<b>5,144</b>
		Female	5,09	1,08	5,36	0,38	<b>2,961</b>	<0,05	<b>5,211</b>
10	Shuttle run 4 x 10m (s).	Male	12,23	1,13	11,90	0,85	<b>3,294</b>	<0,05	<b>2,727</b>
		Female	13,28	0,51	12,92	0,92	<b>4,231</b>	<0,05	<b>2,706</b>
11	Standing long jump (cm).	Male	140,67	15,25	146,83	10,48	<b>4,648</b>	<0,05	<b>4,305</b>
		Female	134,40	13,49	140,31	10,02	<b>4,381</b>	<0,05	<b>4,334</b>
12	Endurance run in 5 minutes (m).	Male	818,39	94,61	853,66	60,95	<b>4,376</b>	<0,05	<b>4,219</b>
		Female	738,89	52,38	771,11	55,06	<b>5,278</b>	<0,05	<b>4,296</b>

**Table 8. Results of testing and evaluating the development of physical fitness before and after the experiment of primary school students in Thanh Hoa province, Grade 5 (10 years old)**

No.	Test content (male = 30, female = 30)	Gender	Test result ( $\bar{x} \pm \delta$ )				Difference		Growth pace (W%)
			Before the experiment		After the experiment		t	P	
			TBC	DLC	TBC	DLC			
1	Standing height (cm)	Male	137,26	23,85	141,45	10,10	<b>2,257</b>	>0,05	<b>3,004</b>
		Female	135,74	22,18	139,91	9,99	<b>2,133</b>	>0,05	<b>3,024</b>
2	Weight (kg)	Male	32,93	12,02	34,77	2,48	<b>2,094</b>	>0,05	<b>5,438</b>
		Female	33,07	11,35	35,01	2,50	<b>2,083</b>	>0,05	<b>5,712</b>
3	Quetelet index (g/cm)	Male	239,69	58,33	245,82	17,55	<i>1,405</i>	>0,05	<b>2,525</b>
		Female	243,56	54,23	250,24	17,87	<i>1,458</i>	>0,05	<b>2,709</b>
4	BMI (kg/m <sup>2</sup> )	Male	17,48	2,76	17,38	1,24	<i>0,482</i>	>0,05	<b>0,600</b>
		Female	17,97	2,18	17,89	1,28	<i>0,416</i>	>0,05	<b>0,471</b>
5	Cardiac function Index (HW)	Male	10,75	2,06	10,41	0,74	<b>2,160</b>	>0,05	<b>3,200</b>
		Female	10,87	1,95	10,53	0,75	<b>2,045</b>	>0,05	<b>3,200</b>
6	Dominant hand grip strength (kg).	Male	17,24	7,90	18,43	1,32	<b>2,071</b>	<0,05	<b>6,661</b>
		Female	16,23	6,86	17,38	1,24	<b>2,060</b>	<0,05	<b>6,866</b>
7	Sit-up (times/30s).	Male	15,30	3,05	16,11	1,15	<b>3,464</b>	<0,05	<b>5,106</b>
		Female	15,80	3,31	16,65	1,19	<b>2,993</b>	<0,05	<b>5,154</b>
8	30m high start sprint (s).	Male	5,97	0,68	5,81	0,42	<b>2,831</b>	<0,05	<b>2,758</b>
		Female	6,51	0,39	6,33	0,45	<b>3,594</b>	<0,05	<b>2,716</b>
9	Trunk flexibility (cm)	Male	5,03	1,11	5,29	0,38	<b>3,176</b>	<0,05	<b>5,116</b>
		Female	5,46	1,30	5,75	0,41	<b>2,667</b>	<0,05	<b>5,192</b>
10	Shuttle run 4 x 10m (s).	Male	12,10	1,19	11,77	0,84	<b>3,155</b>	<0,05	<b>2,706</b>
		Female	12,82	0,69	12,47	0,89	<b>3,827</b>	<0,05	<b>2,716</b>
11	Standing long jump (cm).	Male	158,30	23,67	163,65	11,68	<b>2,831</b>	<0,05	<b>3,324</b>
		Female	144,19	17,83	149,09	10,64	<b>2,939</b>	<0,05	<b>3,343</b>
12	Endurance run in 5 minutes (m).	Male	838,91	103,68	875,07	62,48	<b>4,171</b>	<0,05	<b>4,219</b>
		Female	774,09	58,02	807,84	57,68	<b>5,136</b>	<0,05	<b>4,219</b>

### Pre-Experimental Test Results

***In terms of morphology and function:*** The morphological and functional indicators of primary school students in Thanh Hoa province are similar to or higher than that of Vietnamese people of the same age in the early 21<sup>st</sup> century.

***In terms of physical qualities:*** The test results show that most general physical fitness tests show that basically the general physical fitness of primary school students in Thanh Hoa province is not better, and similar to the physical qualities of Vietnamese people of the same age in the early 21<sup>st</sup> century.

## **Post-Experimental Test Results**

After finishing the experimental process of applying the model, the research subjects were applied the selected physical training model, equipped with skills to perform moves, general physical fitness and expertise in the physical education program, and these subjects also participated in training in talent classes, outside of regular school hours, elective sports clubs as well as other forms of training proposed and built in the research process. The results are presented in Tables 5 to 9.

***In terms of morphological and functional factors:*** The test results of all post-experimental tests increased compared to before the experiment. Most tests have a difference between pre- and post-experimental results ( $t_{\text{calculated}} > t_{\text{table}} = 2,042$  at probability threshold  $P < 0.05$ ), except for the Quetelet index and BMI in some classes where there is no difference between the pre- and post-experimental results ( $t_{\text{calculated}} < t_{\text{table}}$  at probability threshold  $P > 0.05$ ).

***In terms of general physical qualities:*** After the experiment, the physical fitness level of both men and women in the experiment had a marked difference ( $t_{\text{calculated}} > t_{\text{table}} = 2.042$  at probability threshold  $P < 0.05$ ).

The performance progress in all 12 criteria, the test assessing physical qualities and physical training standards of the research subjects (in both men and women) after the experiment increased, greater than the pre-experimental time, the average growth rate compared to before the experiment of males from grade 1 to grade 5 from 0.600 to 6.661, of females from 0.471 to 6.866.

## **CONCLUSION**

The physical status of primary school students in Thanh Hoa province, Vietnam is still low, although there is morphological development, as well as general physical fitness level by age (from grade 1 to grade 5 - ages from 6 to 10), but that development is slow, and is only similar to the physical fitness of Vietnamese people in the early 21<sup>st</sup> century.

The reason for this situation is that there has not been an increase in awareness of the importance of physical education and health-related activities within the curriculum. In addition, the physical education facilities provided by schools fail to motivate and meet the exercise requirements of students. There is a deficiency in policy frameworks and organizational guidance for extracurricular physical activities and sports competitions. Students lack appropriate physical education training models, despite their relatively high demand (with 73.33% of students expressing interest in joining extracurricular sports clubs).

During the research process, 03 extracurricular physical training models were developed with specific instructions aimed at enhancing the physical fitness of primary school students in Thanh Hoa province, Vietnam. At the same time, through practically testing the organization and management of learning hours for research subjects, the models have proven to be effective in improving the physical fitness of primary school students in Thanh Hoa. This is reflected by the fact that the test results of all tests after the experiment increased compared to before the experiment with the average growth rate compared to before the experiment of males from grade 1 to grade 5 from 0.600 to 6.661, of females from 0.471 to 6.866; the average growth pace reached 46.551%.

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- Article source: The article is excerpted from the provincial social science and humanities research topic: "Research on physical fitness development solutions for primary school students in Thanh Hoa province". Provincial Project 2018. Principal investigator: Dr. Dong Huong Lan.