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Physical Condition of Grade 3 Students in Primary Schools in Hanoi City

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Abstract

Using conventional scientific research methods in physical education and sports, the study assessed the physical status of grade 3 students at some primary schools in Hanoi. Data were collected through standardized physical tests, including height, weight, body mass index (BMI), and physical indicators of endurance, strength, and flexibility. The results showed that there were significant differences between groups of students by region (urban-rural), as well as between male and female students. Several students had BMI indexes that did not meet the standard, indicating malnutrition or overweight. These findings provide a scientific basis for adjusting school physical training and nutrition regimens to improve students' health.

I. INTRODUCTION

The physical development of primary school students plays a vital role in comprehensive growth and development. Maintaining a healthy body at this age affects the ability to learn and children's long-term health. In Vietnam, physical education programs in schools have been improved, but there are still challenges related to nutrition and exercise and the gap between urban and rural areas. With the characteristics of a significant economic and cultural center, Hanoi has good conditions for physical education development but also faces problems such as a lack of playgrounds, sedentary habits of urban students, or limited facilities in schools in the suburbs. Therefore, assessing the physical condition of primary school students, especially grade 3 - an essential stage in the physical development process- is necessary to propose appropriate solutions to improve the quality of physical education and student health.

Research methods: The thesis used the following research methods during the research process: Document analysis and synthesis, interviews, pedagogical testing, medical testing, and mathematical statistics.

II. RESEARCH RESULTS

2.1 Determine indicators and physical assessment tests for grade 3 primary school students in Hanoi city

The determination of indicators and physical assessment tests for grade 3 students is carried out in the following steps: - Synthesis of relevant Research works on the physical investigation of Vietnamese people [3]; ASEAN physical assessment indicators [6]; Decision 53/BGDĐT-QĐ 2008 of the Ministry of Education and Training of Vietnam on physical assessment of students [1].

- Interviewing experts and scientists. The results have identified 09 indicators and tests to

assess the physical fitness of primary school students (grades 1-3) in Hanoi. These are the indicators:

1. Standing height (cm)
2. Weight (kg)
3. BIM index (kg/m2)
4. Dominant grip strength (kg)
5. Supine sit-ups (number of times/30 seconds)
6. On-the-spot long jump (cm)
7. 30m XPC run (seconds)
8. 4x10m shuttle run (seconds)
9. 5-minute free run (m)

2.2. Physical status of grade 3 students in Hanoi city

The topic involves conducting physical examinations of grade 3 students. The specific number of research samples is 283 students from grade 3 (Male = 142 students, female = 141 students).

The test results are compared with the physical standards of the Ministry of Education and Training, the results of the physical investigation of Vietnamese people according to ASEAN criteria of the Institute of Sports Science.

The test results are presented from table 1 to table 2.

Table 1 shows the physical examination results of grade 3 students at some primary schools in Hanoi. The results reflect basic indicators such as height, weight, BMI, hand strength, speed, endurance, and motor coordination ability of male and female students.

From the research results, Table 1 presents the results of physical examinations of third graders at some primary schools in Hanoi, showing the differences between male and female students regarding height, weight, strength, endurance, and speed. Analyzing this data helps clarify the trend of physical development at this age and compare it with previous studies to have a more comprehensive view.

General assessment of physical fitness of 3rd-grade students

Male students have an average height of 127.69 cm, slightly higher than females (126.28 cm).

The average weight of males is 34.58 kg, higher than that of females (32.17 kg).

The BMI index of males (21.23 kg/m²) and females (20.29 kg/m²) does not show a big difference, but it still shows a tendency for males to have a more significant body weight.

Analyze strength, endurance, and speed metrics.

Dominant grip strength (kg): Male students: 14.24 kg, higher than female students (12.81 kg). The standard deviation (δ) for males is 1.19, and for females is 1.04, indicating that the data variation is insignificant.

Supine sit-ups (number of times/30 seconds): Male students: 10.08 times, higher than female students (7.39 times). The standard deviation for males (2.19) is higher than that for females (1.76), indicating that the data dispersion in males is more excellent.

This is a test of abdominal strength, and males have better results than females. This may be related to body structure, as males have a higher muscle ratio than females, but this difference is usually not too significant in primary school age.

On-the-spot long jump (cm): Males: 137.02 cm, higher than females (127.04 cm). The standard deviation of both groups is about 6.2 cm, showing similar levels of variation.

30m high start run (seconds): Males: 6.29 seconds, faster than females (7.34 seconds). The standard deviation of females (0.48) is higher than that of males (0.29), showing that the speed of males is more uniform.

4x10m shuttle run (seconds): Males: 13.52 seconds, faster than females (13.65 seconds). The standard deviation of the two groups is almost the same (0.39 for males and 0.51 for females).

5-minute free run (m): Males: 755.2 m, higher than females (722.8 m). The standard deviation of males (37.25 m) and females (35.8 m) is not too different.

General comments: Boys have an

advantage over girls in strength (grip strength, long jump), speed (30m run), and endurance (5-minute run).

In most tests, girls tend to be shorter than boys, but the difference is insignificant.

This result is consistent with previous studies on children's physical development, which show that boys tend to be stronger in strength and speed, while girls have more stability and flexibility.

Table 2 shows third-grade students' physical fitness classification results according to Decision 53/2008/BGDĐT-QD of the Ministry of Education and Training, reflecting the difference between boys and girls in physical fitness tests. A detailed analysis of these data helps better understand the physical condition of primary school students and provides appropriate recommendations for improving the quality of physical education in schools.

General assessment of male and female students' physical fitness

The overall physical fitness ranking results show that the proportion of male students with "Good" physical fitness is 16.2%, higher than that of female students (20.57%).

The proportion of male students meeting the requirements ("Passed") is 66.2%, higher than that of female students (54.61%).

However, the proportion of female students "Not Passed" is 24.82%, significantly higher than that of male students (17.61%), indicating that female physical fitness tends to be weaker than that of male students.

Detailed analysis of physical indicators

Dominant grip strength (kg) – Assessment of arm strength: Male students: 29.58% rated "Good," 64.79% "Achieved," and only 5.63% "Not achieved." Female students: 24.82% rated "Good," 70.92% "Achieved," and only 4.26% "Not achieved."

Supine sit-ups (number of times/30 seconds) – Assessment of abdominal strength: Male students: 35.92% rated "Good," 60.56% "Achieved," and only 3.52% "Not achieved." Female students: 32.62% rated "Good," 63.83% "Achieved," and only 3.55% "Not achieved."

Standing long jump (cm) – Leg strength assessment: Male students: 23.94% rated "Good," 73.94% "Achieved," and only 2.11% "Not achieved." Female students: 17.02% rated "Good," 78.72% "Achieved," and only 4.26% "Not achieved."

Table 1. Results of physical examination of students at some primary schools in Hanoi - Grade 3

No	Content	Male (n=142)				Female (n=141)			
		$\bar{x}$	δ	Mx	Cv	$\bar{x}$	δ	Mx	Cv
1	Standing height (cm)	127,69	7,97	0,67	0,06	126,28	6,91	0,58	0,05
2	Weight (kg)	34,58	6,06	0,51	0,18	32,17	4,23	0,36	0,13
3	BIM index (kg/m2)	21,23	3,37	0,28	0,16	20,29	3,13	0,26	0,15
4	Dominant grip strength (kg)	14,24	1,19	0,1	0,08	12,81	1,04	0,09	0,08
5	Supine sit-ups (number/30 seconds)	10,08	2,29	0,19	0,23	7,39	1,76	0,15	0,24
6	On-the-spot long jump (cm)	137,02	6,21	0,52	0,05	127,04	6,16	0,52	0,05
7	30m XPC run (seconds)	6,29	0,54	0,05	0,09	7,34	0,48	0,04	0,07
8	4x10m shuttle run (seconds)	13,52	0,39	0,03	0,03	13,65	0,51	0,04	0,04
9	5-minute effort run (m)	755,2	37,25	3,13	0,05	722,86	35,8	3,01	0,05

Table 2. Results of physical fitness classification of students according to Decision 53/2008/BGDDT-QD of the Ministry of Education and Training - Grade 3

No	Content	Male (n=142)						Female (n=141)					
		Tốt	*%*	*Đạt*	*%*	*Chưa đạt*	*%*	*Tốt*	*%*	*Đạt*	*%*	*Chưa đạt*	*%*
1	Dominant grip strength (kg)	42	29,58	92	64,79	8	5,63	35	24,82	100	70,92	6	4,26
2	Supine sit-ups (reps/30s)	51	35,92	86	60,56	5	3,52	46	32,62	90	63,83	5	3,55
3	On-the-spot long jump (cm)	34	23,94	105	73,94	3	2,11	24	17,02	111	78,72	6	4,26
4	30m XPC run (sec)	48	33,8	82	57,75	12	8,45	40	28,37	90	63,83	11	7,8
5	4x10m shuttle run (sec)	21	14,79	114	80,28	7	4,93	42	29,79	86	60,99	13	9,22
6	5-minute free run (m)	23	16,2	114	80,28	5	3,52	12	8,51	114	80,85	15	10,64
7	Overall average rate	37	26,06	99	69,72	7	4,93	33	23,4	99	70,21	9	6,38
8	Overall fitness rating	**23**	**16,2**	**94**	**66,2**	**25**	**17,61**	**29**	**20,57**	**77**	**54,61**	**35**	**24,82**

30m high start sprint (seconds) – Speed assessment: Male students: 33.8% rated as "Good," 57.75% "Passed," and 8.45% "Not Passed." Female students: 23.97% rated as "Good," 60.83% "Passed," and 7.8% "Not Passed." 4x10m shuttle run (seconds) – Flexibility and speed assessment: Male students: 14.79% rated as "Good," 80.28% "Passed," and only 4.93% "Not Passed." Female students: 29.69% rated as "Good," 60.99% "Passed," but 9.22% "Not Passed."

5-minute free run (m) – Endurance assessment: Male students: 16.2% rated as "Good," 80.28% "Passed," and only 3.52% "Not Passed." Female students: 15.85% rated as "Good," and 80.85% "Passed," but the "Not Passed" rate was higher (10.64%).

In summary, Male students achieve higher results than females in strength tests (long jump, grip strength) and speed tests (30m run, shuttle run).

Female students have a higher "Not Passed" rate, especially in tests requiring speed and endurance.

The overall physical fitness assessment results show that males have a higher rate of meeting the requirements than females (66.2% vs. 54.61%), while females have a significantly higher "Not Passed" rate (24.82% vs. 17.61%).

Table 3 compares the physical fitness test results of third graders in Hanoi with those of Can Tho, Da Nang, and Son La provinces according to the ASEAN-standard Vietnamese physical fitness survey (Institute of Sports and Physical Education, 2020). These results help identify differences between regions, thereby making recommendations to improve nutrition, health care, and physical fitness for students.

Comparison of body mass index between regions

- Average height

Urban male students: Hanoi (127.66 cm) is significantly shorter than Can Tho (134.8 cm, $p<0.01$), Da Nang (132.9 cm, $p<0.01$), and Son La (132.3 cm, $p<0.01$).

Rural male students: Hanoi (127.71 cm) is shorter than Can Tho (134.3 cm, $p<0.01$) and Da Nang (131.4 cm, $p<0.01$) but not significantly different from Son La (126 cm, $p>0.05$).

Urban female students: Hanoi (125.98 cm) is shorter than Can Tho (133.6 cm, $p<0.01$), Da Nang (137 cm, $p<0.01$), and Son La (138.6 cm, $p<0.01$).

Rural female students: Hanoi (126.59 cm) is shorter than Can Tho (134.3 cm, $p<0.01$) and Da Nang (134.4 cm, $p<0.01$), but not different from Son La (128.3 cm, $p>0.05$).

Hanoi students have a lower average height than Can Tho, Da Nang, and Son La.

- Average weight

Urban male students: Hanoi (34.27 kg) is shorter than Can Tho (36.41 kg, $p<0.05$) but

not different from Da Nang (33.27 kg, p>0.05). Hanoi is taller than Son La (30.45 kg, p<0.01).

Rural male students: Hanoi (34.86 kg) is lower than Can Tho (42.6 kilograms, p<0.01) and Da Nang (32.74 kg, p>0.05) but higher than Son La (22.99 kg, p<0.01).

Table 3. Comparison of body morphology test results of Hanoi students with students from other provinces according to the results of the Vietnamese physical fitness survey according to ASEAN criteria (2020 by the Institute of Sports Science) - Grade 3

Object	Area	Index	Hanoi		Can Tho		t	P	Da Nang		t	P	Son La		t	P
			$\bar{x}$	δ	$\bar{x}$	δ			$\bar{x}$	δ			$\bar{x}$	δ		
Male	Urban (n=69) Rural (n=73)	Height (cm)	127,66	8,38	134,8	0,05	7,08	<0.01	132,9	0,06	5,19	<0.01	132,3	3,84	4,18	<0.01
		Weight (kg)	34,27	5,62	36,41	5,62	2,24	<0.05	33,27	4,85	1,12	>0.05	30,45	3,6	4,75	<0.01
		BMI (kg/m2)	21,05	3,07	20,01	2,8	2,08	<0.05	12,49	1,58	20,59	<0.01	17,39	1,95	8,36	<0.01
	Urban (n=72)	Height (cm)	127,71	7,61	134,3	0,03	7,4	<0.01	131,4	0,05	4,14	<0.01	126	4,29	1,67	>0.05
		Weight (kg)	34,86	6,48	42,6	3,6	8,92	<0.01	32,74	7,83	1,78	>0.05	22,99	4,4	12,95	<0.01
		BMI (kg/m2)	21,39	3,64	21,18	7,41	0,22	>0.05	12,43	2,83	16,6	<0.01	14,41	2,1	14,19	<0.01
Female	Rural (n=69) Urban (n=69)	Height (cm)	125,98	7,14	133,6	0,05	9,06	<0.01	137	4,85	10,83	<0.01	138,6	6,06	11,43	<0.01
		Weight (kg)	31,98	4,08	38	3,32	9,71	<0.01	35,78	4,48	5,32	<0.01	35,45	5,65	4,22	<0.01
		BMI (kg/m2)	20,3	3,3	21,33	2,15	2,22	<0.05	19	1,5	3,04	<0.01	18,4	2,53	3,88	<0.01
	Rural (n=73)	Height (cm)	126,59	6,69	134,3	0,02	9,57	<0.01	134,4	6,75	6,83	<0.01	128,3	2,5	1,99	<0.05
		Weight (kg)	32,37	4,4	33,2	5,43	0,99	>0.05	32,86	8,85	0,41	>0.05	22,65	2,15	16,49	<0.01
		BMI (kg/m2)	20,27	2,97	18,42	3,17	3,54	<0.01	17,95	3,26	4,37	<0.01	13,76	1,18	16,92	<0.01

Table 4. Comparison of physical fitness test results with 2001 physical fitness survey - Grade 3

No	Content	Male				t	P	Female				t	P
		Nationwide		Hanoi				Nationwide		Hanoi			
		$\bar{x}$	δ	$\bar{x}$	δ			$\bar{x}$	δ	$\bar{x}$	δ		
1	Dominant grip strength (kg)	13,8	2,61	14,24	1,19	1,83	>0.05	12,5	2,49	12,81	1,04	1,36	>0.05
2	Supine sit-ups (reps/30s)	8,5	2,17	10,08	2,29	5,97	<0.01	6	1,49	7,39	1,76	7,16	<0.01
3	On-the-spot long jump (cm)	135	15,9	137,02	6,21	1,41	>0.05	125	15,3	127,04	6,16	1,47	>0.05
4	30m XPC run (sec)	6,4	0,63	6,29	0,54	1,58	>0.05	6,9	0,71	7,34	0,48	6,1	<0.01
5	4x10m shuttle run (sec)	13,6	0,33	13,52	0,39	1,87	>0.05	13,8	0,31	13,65	0,51	2,98	<0.01
6	5-minute effort run (m)	794	123	755,2	37,25	3,6	<0.01	720	111	722,86	35,8	0,29	>0.05

Urban female students: Hanoi (31.98 kg) is lower than Can Tho (38 kg, p<0.01), Da Nang (35.78 kg, p<0.01), and Son La (35.45 kg, p<0.01).

Rural female students: Hanoi (32.37 kg) is lower than Can Tho (33.2 kilograms, p>0.05)

but higher than Son La (22.65 kg, $p<0.01$).

Children in Hanoi generally weigh less than those in Can Tho and Da Nang, especially among female students. Son La has the lowest weight, which reflects the more limited nutritional status in mountainous areas.

- BMI index (kg/m²)

Urban male students: Hanoi (21.05) is higher than Da Nang (12.49, $p<0.01$) but lower than Son La (17.39, $p<0.01$).

Rural male students: Hanoi (21.39) is not different from Can Tho (21.18, $p>0.05$) but higher than Son La (14.41, $p<0.01$).

Urban female students: Hanoi (20.3) is lower than Can Tho (21.33, $p<0.05$) but higher than Da Nang (15.03, $p<0.01$) and Son La (18.4, $p<0.01$).

Rural female students: Hanoi (20.27) is higher than Son La (17.95, $p<0.01$) but lower than Da Nang (17.95, $p<0.01$).

The BMI of Hanoi students is not much different from Can Tho's but significantly higher than Da Nang and Son La. Son La students have the lowest BMI, reflecting poorer nutritional conditions.

General comments: Hanoi students, especially urban males, have a lower average height than Can Tho, Da Nang, and Son La. Hanoi students' weight is lower than that of students in the South, indicating the influence of nutrition. The BMI of Hanoi students is not significantly different from that of Can Tho but is higher than that of Da Nang and Son La, reflecting differences in living habits and nutrition. Son La students tend to be underweight and have lower BMI, indicating the impact of mountainous living conditions.

The Research results in Table 4 show some of the following characteristics

- Comparison of hand and abdominal strength

Dominant hand grip strength (kg):

Male: Hanoi's weight (14.24 kg) is higher but not significantly different from the whole country's (13.8 kilograms, $p>0.05$).

Female: Hanoi (12.81 kg) is almost equivalent to the whole country (12.5 kilograms, $p>0.05$).

- Lying on back to do sit-ups (number of times/30 seconds):

Male: Hanoi (10.08 times) is significantly higher than the whole country (8.5 times, $p<0.01$).

Female: Hanoi (7.39 times) is significantly higher than the whole country (6 times, $p<0.01$).

Thus, the hand grip strength of Hanoi students is not significantly different from that of the whole country, showing that the ability to develop hand strength is similar in urban and rural children.

The number of sit-ups performed by Hanoi students was significantly higher, indicating better abdominal muscle development. This may be because the physical education program in Hanoi focuses more on core exercises, or city students are used to sitting for long periods, leading to stronger abdominal muscles.

- Comparison of leg strength and running speed

On-the-spot long jump (cm): Male: Hanoi (137.02 cm) is almost equivalent to the national average (135 cm, $p>0.05$). Female: Hanoi (127.04 cm) is nearly equivalent to the national average (125 cm, $p>0.05$).

30m high start run (seconds): Male: Hanoi (6.29 seconds) is almost equivalent to the national average (6.4 seconds, $p>0.05$). Female: Hanoi (7.34 seconds) is significantly faster than the national average (6.9 seconds, $p<0.01$).

Thus, Hanoi students have on-the-spot long jump performances equivalent to the whole country, proving no difference in leg strength development between urban and rural children. Hanoi female students run the 30m high start significantly faster, reflecting better acceleration and leg strength, possibly because the urban environment requires faster reflexes, thereby helping to improve speed.

- Comparison of coordination and endurance

4x10m shuttle run (seconds): Male: Hanoi (13.52 seconds) is faster than the national average (13.6 seconds, $p>0.05$).

Female: Hanoi (13.65 seconds) is significantly faster than the national average (13.8 seconds, $p<0.01$).

5-minute free run (m): Male: Hanoi (755.2 m) is significantly lower than the national average (794 m, $p<0.01$). Female: Hanoi (722.86 m) is almost equal to the national average (720 m, $p>0.05$).

Hanoi students, especially female students, run the shuttle significantly faster, demonstrating better flexibility and speed when changing directions. This may be due to the urban environment requiring faster reflexes in traffic and daily activities.

Hanoi male students have significantly lower 5-minute free-running results than the national average, indicating lower endurance. City students rarely participate in continuous physical activities such as jogging and soccer, causing their endurance to decrease.

General comments: Hanoi students' grip strength did not differ significantly from the national average, but the number of sit-ups was higher, indicating better abdominal muscle development. There was no significant difference in the on-the-spot long jump, but Hanoi female students ran 30m faster, reflecting differences in speed development. Hanoi students had better shuttle running performance, especially female students, demonstrating better flexibility. Hanoi male students had significantly lower endurance than the national average and needed to find solutions to improve. Possible reasons: The urban environment requires quick reflexes, which helps improve speed and the ability to change direction when running the shuttle. Urban students are less active for a long time, leading to a decrease in endurance.

III. CONCLUSION

The results of the study on the physical status of grade 3 students in primary schools in Hanoi have provided essential data on the physical development of grade 3 students in the current context. The study shows the difference between male and female students and urban and rural students regarding physical indicators such as height, weight, BMI, strength, speed, and endurance. In particular, the malnutrition and overweight status of a group of students shows the need to adjust the diet and physical training regime in schools. Compared with previous studies and physical standards in the country and the ASEAN region, the research results affirm the need for appropriate interventions to improve primary school students' health and physical fitness. From these findings, the development and implementation of physical education programs suitable to children's developmental characteristics while ensuring a balance between exercise and nutrition is extremely important to improve physical condition and enhance the quality of physical education in schools in Hanoi.

ARTICLE SOURCE

The article is quoted from the doctoral thesis "Research on physical development solutions for primary school students in Hanoi City" of the Institute of Sports Science, Vietnam. Chief editor: Ly Quoc Bien.

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