

Study on Some Morphological and Physical Indexes of Vietnamese People

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ABSTRACT--- *Researches were carried out on 7000 students (3500 males and 3500 females), at the age of 16-18. They come from some regions of Northern Vietnam, South Vietnam and Central Vietnam. The results show that in general, the indexes of height, weight, measurement of chest, heart rate etc... have increased compared with those registered in "Vietnamese' physiologic constants in 1975" and those in "Vietnamese' anthropometry in 1990". Some indexes of students from different regions are different. This indicates that living environment has effects on these indexes include as: nutrition, psychological, physical activity and economic and natural conditions.*

Keywords--- regions, physical, morphological, index, Vietnamese, student

1. RATIONALE

Form and physical force are the important indexes from to assess health status. They show a part of actual body status and the relationship between human physiology and environmental factors such as climate, season, nutrition, activities, economy, urbanization, and stress [1]. In Vietnam, there have been many research projects on these problems; for example: "Vietnamese' physiologic constants in 1975" by Nguyen Tan Gi Trong et al [9], "Vietnamese' Anthropometry in 1990", "Project KX 07-07 in 1994" [2,3,4], "Atlats Vietnameses' Anthropometry in 1985" or the surveys conducted in some regions, provinces, schools, colleges, universities by other physiology scientists [2,5,8]. Some other researches done at a smaller level are "Proposal of new indexes and classification of robusticity of Vietnamese adults" by Le Gia Vinh, Vo Hung et al in 1988, "Morphological human races and physical of Ede's males in Tay Nguyen" by Mai Van Thin in 1991, "Some morphological and physical indexes of learners of Thanh Hoa Teachers Training College" by Mai Van Hung, 2001, [3] " The indexes of morphological human races and physical of north Vietnam people adults '90" by Trinh Van Minh, Tran Sinh Vuong et al in 1996, and "A survey of human races of youth and students" by Le Nam Tra et al, 1995 [8].

Most of the previous researches showed that the values of morphological and physical indexes are influenced by the environment [10,11]. However, there have not been projects fully researching the morphological and physical indexes of university students. Therefore, we find it necessary to study some of morphology, and physical indexes of students from North Vietnam, Central Vietnam and South Vietnam and environmental impacts on these indexes.

2. OBJECTIVES

Form and physical force are the most useful indexes used to assess health status. They show actual body status and the relationship between human physiology and environmental factors such as climate, season, nutrition, activity, economy, urbanization and stress. Most previous research has shown that morphological and physical index values are influenced by the environment.

The purpose of this research is to identify ecological environment factors that effect the anthropometry of Vietnam people and from there see if there are differences between the anthropometric indexes of people in the urban region and people in the suburban region, and explain why either urban or suburban Vietnam people got better anthropometric values.

3. TIME, PLACE AND METHOD

Time period of the research: 9/2012 to 12/2012. This study was carried out on 7000 people (3500 male and 3500 female) who were from 16 to 18 years old. They were studying in the following schools:

- Three regions in the North Vietnam, the Central Vietnam and the South Vietnam.
- Using the method of Martin and M.F. Ashley Montagu's method was used to measure morphological indexes [13, 14].

This is a cross-sectional study. Every subject was measured with respect to height, weight and chest girth. Average index values were calculated using Button's formula [15].

- Martin's classical method was used to measure Morphological indexes. Blood pressure and the heart rate (physical indexes) were tested by EW280 P-S equipment (Japan).

This is a cross - sectional study. Every subject had been tested on the height, weight (note: each subject was weighed before wearing thin clothes only), measurement of middle chest, measurement of forced inspiratory, blood pressure and the heart rate, daily for a year from September 2012 until December 2012. The average values of the indexes were calculated based on the Button's formula. All research data were statistically processed and then shown in the tables and figures below, indicating the comparison between some morphological and physical indexes of students of the 3 regions, between the generalized indexes of the targeted students and those of the previous studies and between those of males and females.

4. FINDINGS

Result

General

This description is based on 3500 males and 3500 females. Measurements are given in Table 1.

Table 1. Average basic morphological and physical indexes of students (X ± SD)

No	Index	Male (n= 3500)	Female (n=3500)
1.	Height (cm)	165.51 ± 6.56	155.26 ± 4.89
2.	Weight (kg)	53.21 ± 5.13	45.12 ± 4.66
3.	Middle chest circumference (cm)	79.76 ± 5.81	73.22 ± 6.21
4.	Forced chest circumference (cm)	83.16 ± 4.55	77.20 ± 4.61
5.	Blood pressure: (mmHg)		
	Max	120.23 ± 11.12	113.59 ± 9.13
	Min	76.67 ± 7.16	73.11 ± 8.19
6.	Heart rate (beats/min)	76.26 ± 15.15	79.21 ± 12.40
7.	Pignet	32.6 ± 3.64	35.7 ± 6.57
8.	BMI	19.12 ± 1.56	19.16 ± 1.77

Table 1 shows average morphological and physical base indexes of males and females. The males' indexes of height, weight, measurement of middle chest, measurement of forced inspiratory, and blood pressure are higher than the females'. Meanwhile, the males' heart rate is lower than the females' ($p < 0.01$). This result shows the characteristics of sex. Therefore, basic morphological and physical indexes of students of Northern Vietnam come up to the average standard of Vietnam's youth nowadays. Pignet and BMI of males are approximately equal to and those of females ($p < 0.05$). Pignet and BMI of males and females in this study are approximately the same as those of Vietnamese' index standard of the same age (average Pignet standard: from 27.5 to 33.9).

In comparison with some fundamental studies before (of the same age), most of the values of the study indexes have increased, especially height and weight. Measurements of height and weight are given in Table 2 and Table 3.

Table 2. Average height and weight indexes of males in comparison with those of some other studies (X ± SD)

Index	Our survey 2012	Project KX07.07 1994	Atlats 1985	VPC 1975
Height (cm)	165.51 ± 6.56	162.4 ± 5.5	162.1 ± 5.1	159.0 ± 5.0
Weight (kg)	53.21 ± 5.13	51.2 ± 5	49.4 ± 3.4	45 ± 4

VPC: Vietnamese' physiologic constants

Atlats: Atlats Vietnamese' Anthropometry in 1985

Average indexes of males make difference between studies ($p < 0.01$). The values of indexes in our survey in 2012 have increased by 5 cm (height) and 7 kg (weight) compared with VPC. The height index increased the most from 1975 to 1985, and was stable from 1985 to 1994, and accelerate from 1995 to 2001 (Fig.1).

Meanwhile, the weight continuously increased from 1975 to 2012 (Fig.2).

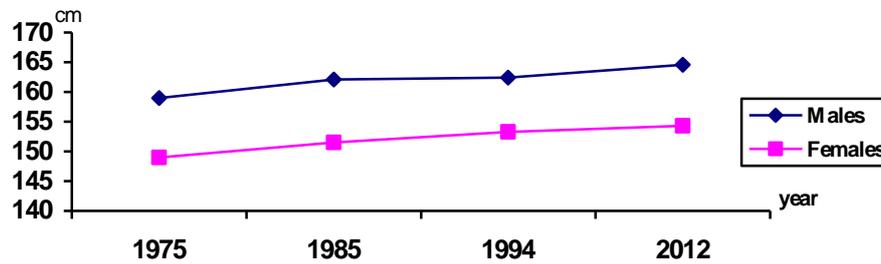


Fig.1. Increase in height from 1975 to 2012

Table 3. Average height and weight indexes of females compared with some other studies ($X \pm SD$)

Index	Our survey 2012	Project KX07.07 1994	Atlats 1985	VPC 1975
Height (cm)	155.26 ± 4.89	153.3 ± 4.7	151.5 ± 5.3	149 ± 4
Weight (kg)	45.12 ± 4.66	45.3 ± 3.9	44.7 ± 3.2	43 ± 4

VPC: Vietnameses' physiologic constants

Atlats: Atlats Vietnameses' Anthropometry in 1985

Average indexes of females are also different between studies ($p < 0.01$). The indexes of our survey in 2001 have increased by about 5 cm (height) and 2 kg (weight). The height continuously increased from 1975 to 2012 (Fig .1). The weight is on a slow rise (Fig. 2).

Consequently, there was an increase in height and weight of Vietnamese students of ages 18 according to the studies from 1975 to 2012. Meanwhile, females' indexes rose more slowly than males'.

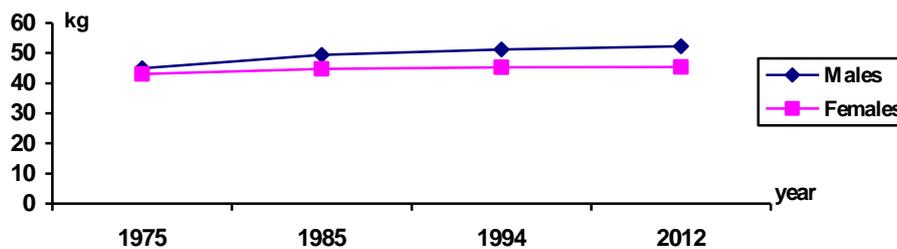


Fig.2. Increase in weight from 1975 to 2012

Comparison between three regions

Average basic morphological and physical indexes of the three regions are presented in Table 4 and Table 5.

Table 4. Average basic morphological and physical indexes of males of the three regions (X ± SD)

No	Index	North Vietnam (n=2500)	Central Vietnam (n=2000)	South Vietnam (n=2500)
1.	Height (cm)	166.71 ± 5.21	163.25 ± 5.96	165.07 ± 6.57
2.	Weight (kg)	55.67 ± 5.75	51.72 ± 5.41	53.12 ± 6.21
3.	Middle chest circumference (cm)	79.10 ± 6.09	78.12 ± 5.61	79.06 ± 6.12
4.	Forced chest circumference (cm)	84.03 ± 5.13	81.15 ± 4.33	82.31 ± 5.43
5.	Blood pressure (mmHg)			
	Max	118.39 ± 9.12	121.08 ± 9.09	120.23 ± 9.9
	Min	75.09 ± 8.17	76.78 ± 10.03	75.16 ± 8.31
6.	Heart rate (beats/min)	73.19 ± 8.05	77.56 ± 9.26	75.04 ± 7.13
7.	Pignet	33.99 ± 4.56	33.41 ± 7.22	33.90 ± 3.20
8.	BMI	19.36 ± 1.78	19.51 ± 1.55	19.15 ± 1.87

As shown in the above table, there was significant difference in the average basic morphological and physical indexes of males such as height, weight, blood pressure and heart rate between North Vietnam and Central Vietnam. Most of these indexes of North Vietnam's students are better than Central Vietnam's students ($p < 0.01$), North Vietnam's students are better than South Vietnam too. However, for some of the indexes, the difference is not significant ($p > 0.05$).

Table 6. Average basic morphological and physical indexes of females of the three regions (X ± SD)

No.	Index	North Vietnam (n=2500)	Central Vietnam (n=2000)	South Vietnam (n=2500)
1	Height (cm)	156.19 ± 5.71	153.71 ± 5.11	155.06 ± 5.21
2	Weight (kg)	46.76 ± 4.27	43.07 ± 5.11	44.29 ± 4.62
3	Middle chest circumference (cm)	72.87 ± 6.89	70.22 ± 5.19	71.35 ± 8.12
4	Forced chest circumference (cm)	76.57 ± 5.29	74.12 ± 3.26	75.31 ± 3.15
5	Blood pressure (mmHg)			
	Max	113.21 ± 7.21	116.52 ± 6.56	115.27 ± 7.13
	Min	71.45 ± 7.11	73.01 ± 6.72	72.79 ± 5.16
6	Heart rate (beats/min)	75.58 ± 5.16	79.59 ± 5.12	75.85 ± 6.35
7	Pignet	34.46 ± 5.28	37.43 ± 7.11	35.24 ± 5.22
8	BMI	19.75 ± 1.56	19.02 ± 1.66	19.27 ± 1.71

The data are presented in Table 6. There is not significant difference in average basic morphological and physical indexes of females. However, students' indexes of North Vietnam are better than those of the two other regions.

Discussion

Results of this survey show that average basic morphological and physical indexes of Vietnamese students are lower than the average standard level of the world, mainly due to race. Another reason is that Vietnam is a tropical country with hot

and humid environment and developing economy. However, average indexes of research objects are getting better over time. This phenomenon is called secular growth changes by scientists. Secular trend is clearly shown in the changes about height, weight, sexual maturation and increase or reduction in the final height. This secular trend is commonly found in the world. In Vietnam, the highest increase occurs from 1975 to 1985 due to not only secular trend but also due to "catch - up". An explanation for this is that before 1975 when the Vietnam was in the war time, living conditions were poor and the environment was polluted [7, 8]. After that, living conditions were improved, which have led to rapid growth of human body (called catch - up).

Table 5 and 6 show the difference in average morphological and physical base indexes between three universities. Students' indexes of North Vietnam are the best. Next comes students' indexes of South Vietnam and then students' indexes of Central Vietnam . Why is there the difference? It can be noted that all of the students at Central Vietnam are the Central Vietnam people. Additionally, this is a poor provinces in central Vietnam. The weather is rather bad. In summer, the temperature and humidity are higher in most of other regions in the country with hot and dry wind (from Laos to central Vietnam) [15]. In contrast, in winter this is one of the cold regions in Vietnam. Therefore, economic conditions and environment have influence on their health and thereby on morphological and physical indexes. Meanwhile, North Vietnam are located in the Red river delta and the South Vietnam are located in the Mekong river delta. This is a rich region with socio - economic development, and favorable environment. Hence, their morphological and physical indexes are better (Table 5, 6) especially those of the students of North Vietnam.

5. CONCLUSIONS

1. Basic morphological and physical indexes of students of Northern Vietnam are approximately equal to the average standard of Vietnam's youth now and smaller than the average standard level in the world.
2. In comparison with the results obtained in recent surveys, it can be seen that the average indexes of students (aged 16-18) are getting better and better over time. This is a secular growth change. Secular trend is clearly shown in the changes about height, weight, sexual maturation and increase or reduction in the final height.
3. The difference in the results of average basic morphological and physical indexes between males and females results from sex characteristics and human adaptation to environmental changes. Females' growth is more stable than males' (Fig. 1,2).

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