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### RESEARCH ARTICLE

**The characteristics of anthropometry indices of the ethnic minorities people in north west region of Vietnam.**

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#### *Manuscript Info*

##### *Manuscript History*

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##### *Key words:-*

ethnic; minority; anthropometry; weight; height.

#### *Abstract*

Research was carried out involving 5230 people aged 16 to 18. They were enrolled in 6 provinces (**Dienbien, Laichau, Sonla, Hoabinh, Yenbai and Laocai**) from North West people in Vietnam included ethnic minorities: Thai, Muong, Dao, Hmong, Tay and Hanhi. The indices evaluate anthropometric parameters for age (including: weight for age, height for age, head circumference for age, neck circumference for age, mid-upper arm circumference for age, chest circumference for age, abdomen circumference for age, and hip circumference for age)... Results showed that: The basic anthropometric indices of people in other ethnic minorities were differences in this parameter between other ethnic minorities however, the development of these anthropometric parameters of them follow rules of body growth of human.

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#### **Introduction:-**

The anthropometry indices are the important indices 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 race. In Vietnam, there have been many research projects on these problems. However, most of the previous researches showed that the values of anthropometry indices are influenced by the environment. However, there have not been projects fully researching the morphological indices of students in high schools.

Therefore, the purpose of this research is to identify the reality of basic anthropometry indices of ethnic minority people who live in 6 different provinces from there to find out the marked differences between anthropometry indices of people in ecological regions. From this research results, it can be build solutions to enhance human quality for Vietnamese for “the strategy of Vietnamese development on period 2011-2020”.

#### **Materials and Methods:-**

This research was conducted on 5230 people aged 16 to 18. They were enrolled in 6 provinces (**Dienbien, Laichau, Sonla, Hoabinh, Yenbai and Laocai**) in North West people in Vietnam included ethnic minorities: Thai, Muong, Dao, Hmong, Tay and Hanhi.

Distribution of people based on ethnicity:

Dienbien people: 850 people (430 male and 420 female).

Laichau people: 800 people (400 male and 400 female).

Sonla people: 880 people (430 male and 450 female).

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Hoabinh people: 950 people (450 male and 500 female).  
 Laocai people: 850 people (430 male and 420 female).  
 Yenbai people: 900 people (450 male and 450 female).

Time period of the research: from January, 2016 to May 2016. Using the method of Martin and M.F., Ashley Montagu's method was used to measure morphological indices. This is a cross-sectional study. Anthropometric parameters were measured, including weight-for-age, height-for-age, head circumference-for-age, neck circumference-for-age, mid-upper arm circumference-for-age, chest circumference-for-age, abdomen circumference-for-age, and hip circumference-for-age. After anthropometric indices, WHO AnthroPlus software was used to assess anthropometry indices of people. Then, collected data were accessed SPSS software to evaluate factors related to development of anthropometric parameters.

**Results and discussion:-**

Anthropometric parameters play an important role in evaluating health status. They reflect a relationship between body physiological activities and surrounding environmental factors. Average basic anthropometric indices of northwest people in Vietnam are presented in Figures.

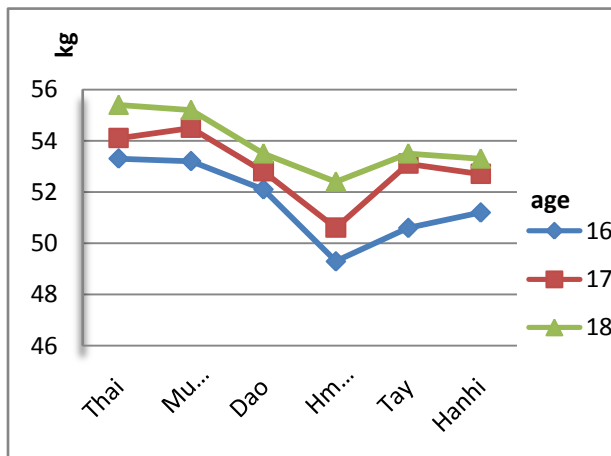


Figure 1. Weight for age of males

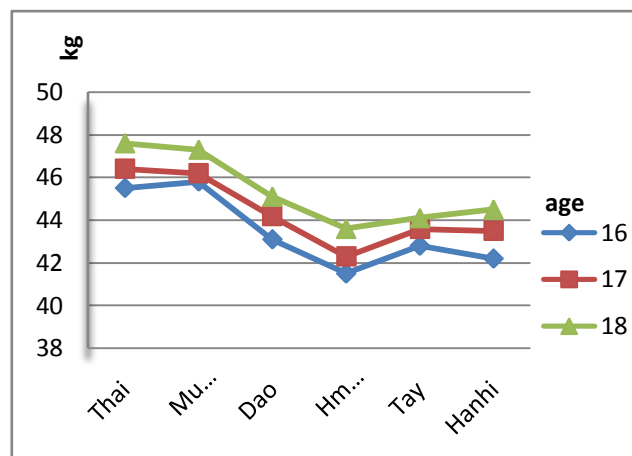


Figure 2. Weight for age of females

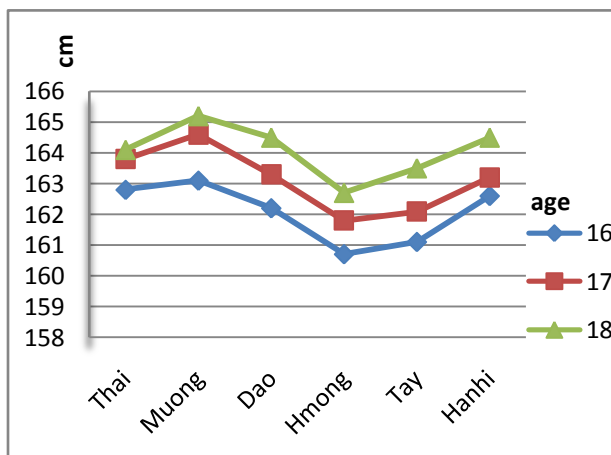


Figure 3. Height for age of males

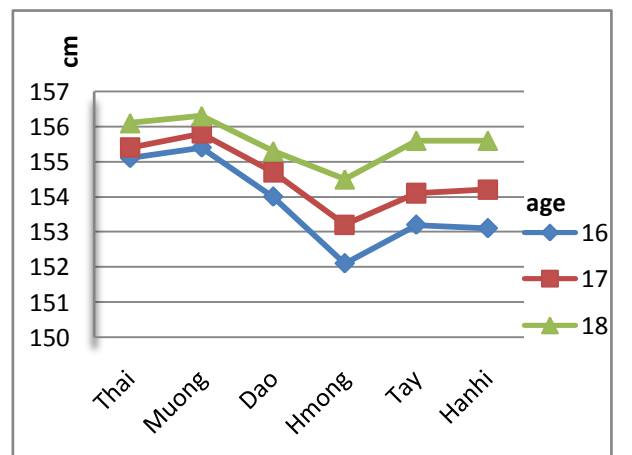


Figure 4. Height for age of females

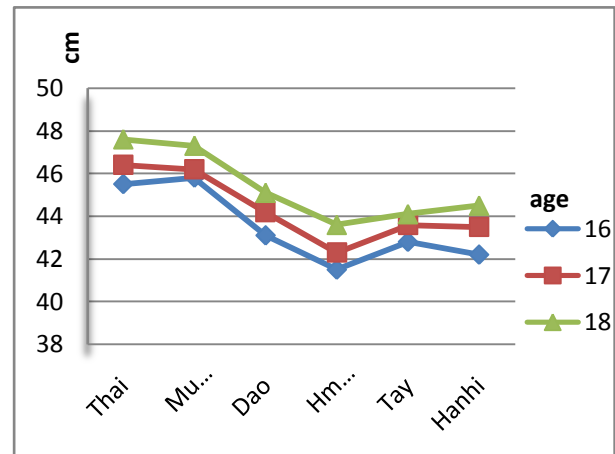
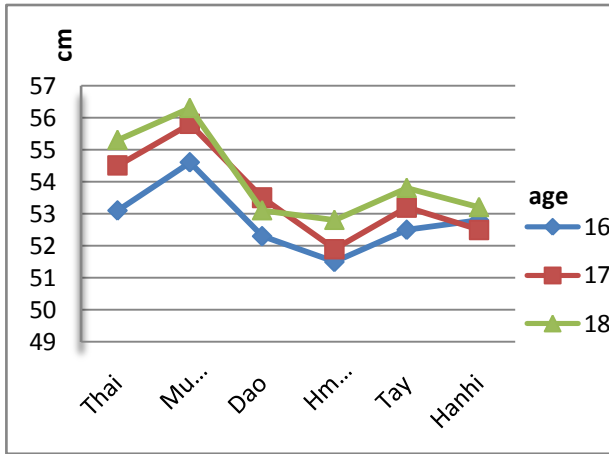


Figure 5. Head circumference for age of males Figure 6. Head circumference for age of females

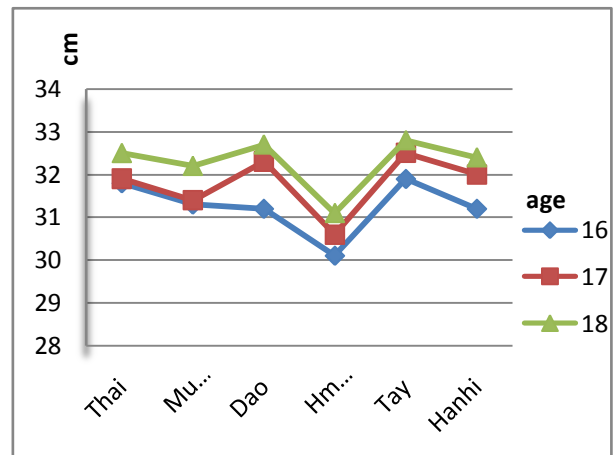
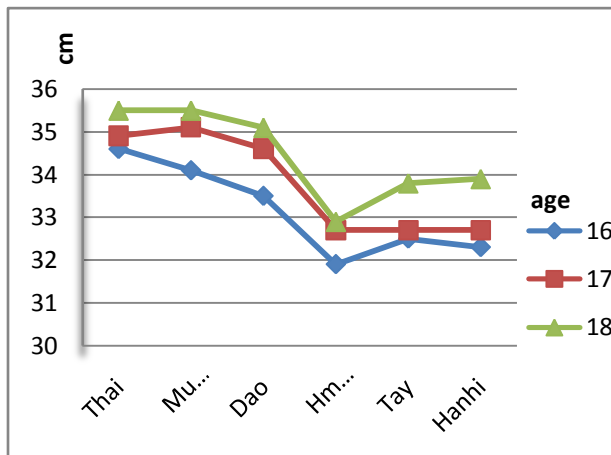


Figure 7. Neck circumference for age of males

Figure 8. Neck circumference for age of females

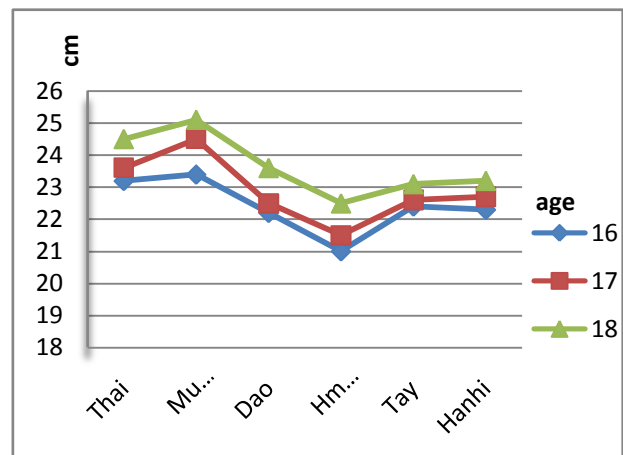
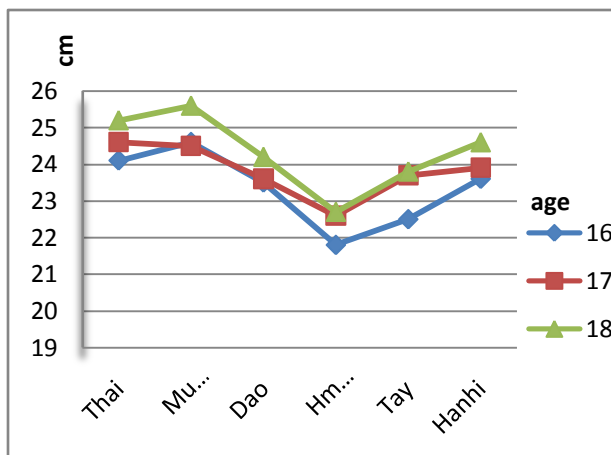


Figure 9. Mid upper arm circumference for age of males Figure 10. Mid upper arm circumference for age of females

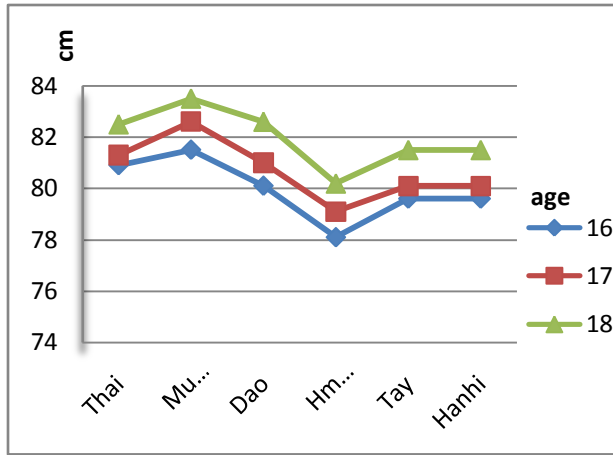


Figure 11. Chest circumference for age of males

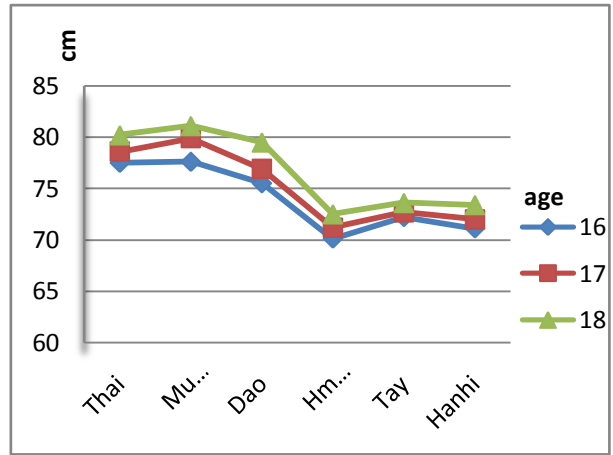


Figure 12. Chest circumference for age of females

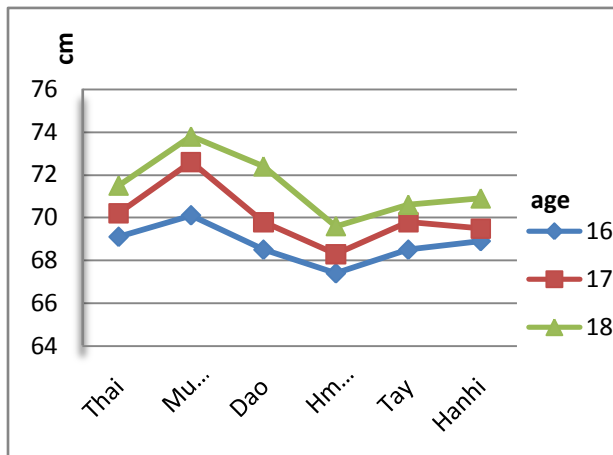


Figure 13. Abdomen circumference for age of males

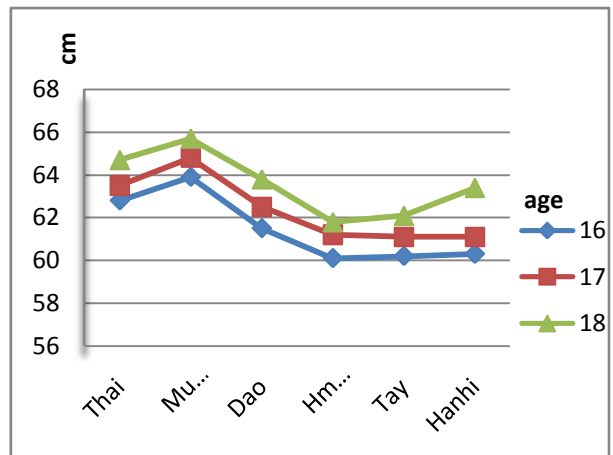


Figure 14. Abdomen circumference for age of females

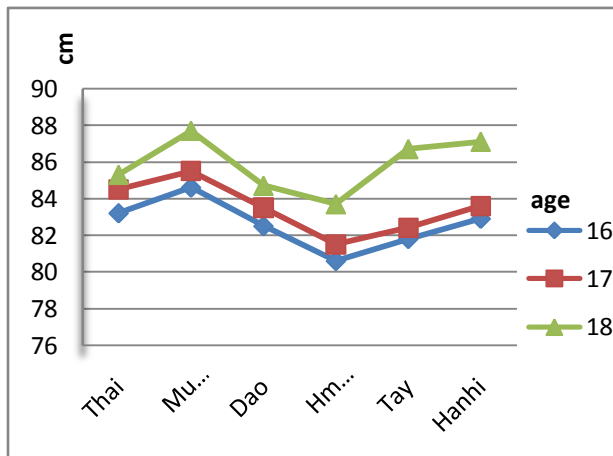


Figure 15. Hip circumference for age of males

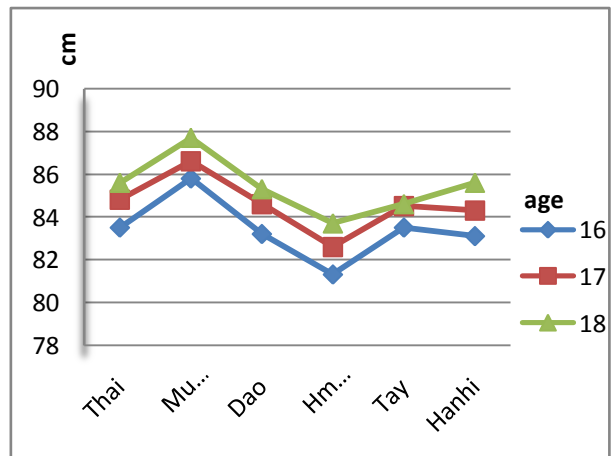


Figure 16. Hip circumference for age of females

**Weight-for-age:-**

Weight is an important index to anthropometric research. Weight relates to other indices in evaluating growth of body. Concerning people, this parameter normally increase with an increase of age. Results showed that the weight of people aged 16 to 18 followed a rule of body growth. There was an increase in body weight with an increase of age.

**Height-for-age:-**

Similar to weight, standing height is an important index to to anthropometric research. It is necessary for evaluating physic status and body form indices. Height varies with different ethnic groups and sex. Moreover, body height changes in different living environments as well. Results in Table 1 showed that the increase of standing height of people aged 16 to 18 follow a rule of body growth. However, this was not statistically different.

**Head circumference-for-age:-**

Results showed that head circumference of people with the increase of age and there was differences in this parameter between other groups. Data in Table showed that mean head circumference of student groups were not similar.

**Neck circumference-for-age:-**

Results of neck circumference-for-age were shown in Table. Mean neck circumference of people was differences between student groups. For example, mean circumference of male Muong people aged 17 was 35.6 cm higher than those of male Hmong people (31.9 cm) ( $P < 0.05$ ), respectively.

**Mid-upper arm circumference-for-age:-**

Left upper arm circumference is a parameter that is easy to determine and it is used extensively around the world to evaluate nutrition status of children, especially emergency situations (food crisis, war etc.). Stevens et al. reported that skinfold thickness was a important measurement to assess nutrition status of children. Data in Table showed that mean left upper arm circumference of South people was higher than other regions people ( $P < 0.05$ )

**Chest circumference-for-age:-**

Chest circumference together with height and weight used to determine body growth status. In present study, chest circumference of people was lower than those of other people ( $P < 0.05$ ) in Vietnam.

**Abdomen circumference-for-age:-**

Abdomen circumference relates to fat and skinniness of body. Results in Table showed that abdomen circumference of people in present study increased with an increase of age. However, the increase was not similar at different ages and different ecological regions people.

**Hip circumference-for-age:-**

Similar to abdomen circumference, hip circumference is an indicator used to evaluate fat and skinniness of body. The results showed that mean hip circumference of South people was greater than that of other regions people ( $P < 0.05$ ). Compared to data of Health Ministry, hip circumference data in the present study were higher. This could be explained by the difference in times that the two studies were conducted.

The Anthropologist of the world has long been much research in the field of ecological human which refers to the characteristics of anthropometric indices in relation to the characteristics of the ecological environment or the height and skeletal morphology changes in physical exercise and in the environmental, psycho-social..., especially the research of the developed countries of Asia where the same race as the people of Vietnam. Through studies in Korea showed that Korean people distributed across the entire country of North Korea and South Korea today. However, Korean people living in Korea has the anthropometric index is better than the Korean people living in North Korea.

To contribute to the success of this strategy by the Government, this research is urgently needed about the theoretical basis and practical basic as apply the information on the status of the anthropometric characteristics of Vietnamese people in other ecology regions, which help to built strategic planning in the future, at the same time find out the causes affect on the anthropometric index. From this research results build solutions to improve the quality of Vietnamese people next time. On the other hand research results provide the latest general information to

the anthropology of Vietnamese people as the basis for the local implementation of the project strategies in each region in Vietnam.

### **Conclusion:-**

The results show that in general. The basic morphological indices of ethnic minorities people of Vietnam are weaker the average standard of the world's youth now. For reasons that effect to anthropometry index of Vietnam people, except for the main influences of genetic, endocrine and race. May be the environment including many factors as location, geography, & climate, regimen, psychology, physical exercise and so on are importance reasons as well which have influenced on people' health, and morphology and physical status of them. The difference in the results of average anthropometry index of Vietnam people between males and females results from sex characteristics and human adaptation to environmental changes.

### **Competing interests:-**

The author declare that they have no competing interests.

### **Authors' contributions:-**

Hung.MV had the original idea for the studies, contributed to the design. Hung.MV drafted the manuscript, which was revised by Hung. MV et al authors. Hung. MV author read and approved the final manuscript.

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