



CHAPTER V

DICUSSIONS, CONCLUSION AND RECOMMENDATION

The objectives of this study were to identify prevalence of overweight, obesity and related factors in primary school children ages 9-10 years in Thainguyen city. Four hundred and sixty children ages 9 and 10 years and their parents participated in the study. The results of this study indicated that the prevalence of obese and overweight children were 3.7 % and 7.8%, respectively.

These rates were lower than others studies in others big cities in Vietnam such as Hanoi, Ho Chi Minh, Haiphong, Nhatrang Prevalence of obese children in Nhatrang was 2.7 % in 1997 after 4 years (2000) prevalence of obese children was 5.88% (Bui,1997). Nguyen T.H. (2000) conducted a study in Haiphong and the results showed that prevalence of obese children was 6.0 % and overweight children was 9.0%. In Ho Chi Minh city (1997) prevalence of overweight children was aged 9-10 were 14.5 % and 11.6 % respectively (Tran T.H.L. 1997). A cohort study conducted by Do K.L (1996-2000) in Hanoi showed that, prevalence of obese primary school children in 1996 was 1.3% and overweight was 7.6% increased to 3.0 and 11% in 1998 and reached the rates of 4.7 and 15.6 % in the year 2000.

In Vietnam average in come 2001-2002 reached 357.000 VND per moth. Average income in urban areas estimated at VND 626.000 and rural 276.000. Ho Chi Minh city, the largest and fastest developing city with the highest per capita income has around

600.000 VND. However average income in Thainguayen city is lower than average income in Vietnam (83.5%). (http://www.achrnet/sup_vietnam.htm)

Generally speaking, prevalence of overweight and obese children in Vietnam was still lower than other countries in region such as China and Thailand and other countries. In Thailand, the prevalence of obesity in 5-12 years old rose from 12.2 % to 15.5% in just 2 years (WHO 2003). Langendijk G. et al. (2003) conducted a survey in KhonKaen, northeast Thailand. The prevalence of childhood obesity aged 7-12 years was 10.8%. As in other countries of the world, obesity has become a health problem for children and adolescent in Thailand especially in big cities such as Bangkok. In Quangdong, China (1998), prevalence in children 19% of boys and 11% of girls were overweight and obese. In developed countries prevalence of obesity was high such as USA prevalence of obese children was 32% (World Heart Federation, June 2002).

In term of related factors with overweight and obesity in children, multiple logistic regression analysis was used to evaluate relative importance of independent variables as determinants of overweight and obesity. The results of this study found that related factors of overweight and obese primary school children ages 9-10 years in Thainguayen city were BMI of mothers, BMI of fathers, physical activity, gender, practice of mothers, and attitude of children.

In addition to environmental influences, certain individuals with a familial history of obesity may become obese. Previous studies showed that genetic inheritance is one of the risk factors of obesity. This study found that there are associations between BMI of children and their parents. Multiple logistic regression analysis was used to evaluate

relative importance of independent variable variables as determinants of overweight and obesity. The results of this study showed that there was somewhat closer relationship between BMI of mothers and their children than father with OR = 1.5 and OR=1.3 respectively, but still a rather strong relationship with fathers. Overweight or obese children were more likely to have overweight obese parents compared to normal children. This finding was consistent with previous studies of Stuck and Frock, Nguyen T.H. (2002), Gran (1981). The results of study conducted by Nguyen T.H. (2002) showed that the risk of obese parents having obese children was 2.5 -3 times more than normal parent, proving that obesity tends to run in family.

According to Gran, (1981) et al. genetic is an important contributor to obesity and obesity runs in family. Only 20% of children with no obese parents are overweight, while 40% of children with one obese parent are overweight. However In both mothers and fathers are obese nearly 80% of children will be come overweight. Stunkard et al (1986) studied a large number of twins in adopted children and the results indicated that BMI of children related with biologic parents but no association with adopted mother. That study indicated that genetic influences are very importance in the etiology of obesity. Gran, S.M. (1981) Bailey, S.M. Solomon et al obesity tends to run in families, suggesting that it may have a genetic cause. However, family members share not only genes but also diet and lifestyles that may contribute to obesity. Separating these lifestyle factors from genetic ones is often difficult. Still, increasing evidence points to heredity as strong determining factor of obesity.

Physical activities are ways of expending energy in order to balance energy intake and expenditure. According to WHO (2002), physical inactivity can have serious implications for people's health. Approximately 2 million deaths per year are attributed to physical inactivity. Physical inactivity has been found to be major factors for several chronic diseases such as coronary heart disease, diabetes hypertension, some cancer, overweight and obesity (Carlos, 2002). In this study, there was statistically significant difference between physical activities and nutritional status of children. Children with higher BMI are less physically active. It is consistent with previous studies by Cao Q.V (1995), Nguyen T.T.H (2001), Simomies E.J. et al (1995), Westerterp K.R. Goran MI. (1997), Chu NF. (2001) in Taiwan, Mabel A. Yap (1994) Singapore, Haapanen N. et al. 1997 in Finland, Steinbeck, Kate (2001) in Australia, Carlos (2002) in USA. These studies also indicated that physical activity was a risk factor for overweight and obesity.

According to WHO 1997, obesity is a consequence of an energy imbalance where energy intake has exceeded energy expenditure over a considerable period. Positive energy balance occurs when energy intake is greater than energy expenditure and it promotes an increase in energy stores and body weight. Conversely, a negative energy balance occurs when intake is less than expenditure, leading to a decrease in energy stores and body weight. Physical activity not only helps to control weight, but also contributes to health of bones, muscles and joints but also helps to relieve pain of arthritis and reduces symptoms of anxiety and depression (Chronic Disease prevention USA 2000). Therefore, in order to prevent overweight and obesity, one should involve the development and

maintenance of life-long patterns of healthy eating habits and regular physical activities ideally with begins in childhood.

The growth of children is affected by age and gender. This study shows that, prevalence of overweight and obesity in boys was 13.5 % and prevalence in girls was 9.0 %. And there was statistically significant association between gender and overweight and obese children. This study confirmed of previous study in Vietnam and others countries such as Le T.H., Vu H.H. (2001) in Hanoi, Nguyen T.H (2002) in Haiphong, Bui V,B. (2002) in Nhatrang, Tran T.H.L. (1998) in Ho Chi Minh, The result of this study also corresponds with those of Li and Bell (2003) who conducted similar study in Shenzhen primary school children among 7-12 years, Guangdong province of China. Prevalence of overweight boys (19%) was higher than girls (11%) with p-value < 0.05. A survey conducted in elementary schools in Fort Worth Texas by Ahmad et al. also showed that obesity was more prevalent in males.

The reason of higher prevalence of overweight boy than girls may be because of culture. Most of families in Vietnam want to have boy, therefore they may indulge boys more than girls. In this study mothers' attitude showed that nearly 10% of them would feed a boy more and better than girl and 20% of them replied that they prefer boy than girl.

In Vietnam, there was no previous study to find out the relationship between knowledge and attitude of children and their nutritional status. Most of studies found the relationship between knowledge of mother and malnutrition in children under 5 years. The result of this study showed that there were statistically significant association

between overweight and obese children and their attitude. This result suggests that attitude of children influenced their nutritional status.

The present study showed that there was statistically significant difference between practice of mother and nutritional status of children. However there were no relationships between knowledge and attitude of mothers and nutritional status of children. It was consistent with previous study conducted in Bangkok by YuKo Tada (2001).

However others previous studies conducted by Dam T.T (2000) and Nguyen T.H. showed that there were association between knowledge, attitude and practice of mother and their malnutrition children under 5 years. The reasons may be that the subjects of those studies were children aged 1-5 years and they were dependent on care of their mothers. Therefore not only practice but also attitude and knowledge of mothers were also important factors of nutritional status of children.

The result of this study also shows that knowledge, attitude of mothers about balance diet and physical activity of mothers were importance factors of their practice. There are statistically significant between knowledge and practice of mothers as same with their attitude and practice.

In terms of relationship between children's knowledge, attitude and overweight or obesity, there was statistically significant between overweight and obesity and their attitude but no relation with their knowledge. This result was consistent with previous

study conducted by Surkovic (2002). That study indicated that there is significant discrepancy between knowledge about healthy food and behavior of mothers

This study indicated that, knowledge and attitude of mothers had far less association practice of mothers and attitude of children. Therefore attitude of children was also an important factor, which related with overweight and obesity in children. These findings suggest that future interventions should pay particular attention not only mothers but also on children. Because children at 9-10 years of age can have perception of healthy diet, life style they will be able to change their behaviors in order to gain and maintain ideal weight.

Many previous studies in Vietnam found that there was relationship between nutritional status of children and income of their families (Vu H.H. 2001; Le T.H 1999; Nguyen T. H. 2002, Do K.L. (2000). These studies also showed that families with high income spent more money on food than families with low income. Besides that, families with high-income level had unhealthy diet such as snacks in the evenings after have dinner, and they ate many times per day. These studies suggest that obesity tends to be a disease of rich people in Vietnam and also in other studies in developing countries such as China, India and Taiwan. In India, a survey was conducted in 1998 by Reddy, B. Nirmala showed that there was the positive relationship between socio-economic status and body mass index.

However, this study found no relationship between income and overweight and obesity of children. The reason may be due to the demographic characteristics of the

study population. Families participated in this study were more homogenous in terms of their economic status. Most of them had high level of income and education.

CONCLUSIONS

The results of this study show that overweight and obesity in school children may be prevalent in small cities like Thainguyen city as well as in big cities such as Hanoi or Ho Chi Minh. In the primary school children underweight and overweight are co-existing in Thainguyen city. According to National Institute of Nutrition in Vietnam (2001) malnutrition in children is on decrease. In 10 years, the reduction is 12 % with the average of 1.2 % a years. However prevalence of overweight children is increasing 1 percent per year and prevalence of obese children increasing by 0.4 percent per year. If there is no control program, prevalence of overweight and obesity will be increasing rapidly in next 10 years and we may need to spend a lot of money and other resources on treating obese patients and their complications. Therefore we need to pay attention to both underweight and overweight and obese children.

In terms of related factors with overweight and obesity in children, the results of this study found that not only genetic factor (BMI of mothers and fathers) but also some environmental factors such as physical activity, attitude of children and practice of mothers and also gender. This could reflect both genetic and environmental influences in overweight and obese in school children in Thainguyen city, so it appears that overweight and obesity results from a complex combination of genetic and environmental factors.

RECOMMENDATIONS

1. We need have cohort study to follow the nutritional status of children and make plan to control.
2. This study indicated that attitude of children are more important than their mothers' attitude. Therefore education program not only focus on parents but also children.
3. We should pay attention on body image attitude and physical activities of children. Children should need to know the way to calculate their body mass in order to have positive attitude on control of overweight and obesity. We need to encourage children to get involved in physical activities.
4. Overweight and obesity tend to run in families therefore we should combine education on healthy diet and lifestyle in parents, focus on vulnerable subjects such as high-income families and those who lack physical activities.
5. Finally, although the present study concentrated on overweight and obesity, it also detected a substantial prevalence of underweight (15%). Therefore, efforts to control overweight should be accompanied efforts to reduce the frequency of underweight.
6. In different country have different cut off point to classify overweight and obesity. However, all previous studies in Vietnam still used criteria of WHO to classify overweigh and obesity. Therefore it may not be correspond with

Vietnamese. In next time, National Institute of Nutrition in Vietnam needs to create for diagnosis of overweight and obesity, which are correspondent with Vietnamese.

Benefit of this study:

1. This study's results can guide the authorities in developing balanced and appropriate actuaries in nutrition and in prevention of overweight
2. This study's results can serve as a useful baseline for future studies.

For further study

- A similar study could be conducted in primary school children at aged 6-11years and also in rural areas to determine the prevalence of overweight and obesity.
- To explore more deeply the effects of parents' and children' attitude on overweight and obesity by conducted both qualitative and quantitative methods