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Study on the distribution status and influencing factors of the overweight and obese children in hebei province

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ABSTRACT

By analyzing the national physique monitoring data obtained in 2010 in Hebei province, It summed up the current situation of overweight and obese people of 3-6 years old in Hebei Province in the age, gender, region and so on, It compared with the national physique monitoring of 3 to 6 years old children of overweight and obesity in 2000 and 2005, analysed the dynamic change trend of overweight and obese children a few years. The aim is to provide the scientific basis for the prevention and control of obesity among children in Hebei Province, help for the promotion of national fitness program. This paper investigated overweight and obesity children by the research method BMI. The research results indicated that children's obesity rate in Hebei province from regional, age characteristics showed a rising trend; sleep time and activity time from age feature presented two different trends. This paper for children will provide reference and basis for further prevent fat and weight loss.

KEYWORDS

Hebei province;
Overweight;
Obese;
Children;
Region;
Age.

INTRODUCTION

As modern society lifestyle changes, including transportation, diet structure changes, people participate in sports exercise less and less, and even less chance to walk in the life. With the improvement of living standards, food tend to be more high quantity of heat, high energy, the incidence of obesity increase rapidly. Obesity is growing as fast as China's economic for Chinese children. Children are in the most vigorous development period, obesity affects growth and development; Intelligence development; Physiological function; Mental health. Ross reported[1] American teenagers obesity rates rise sharply, from 1963 to 2000 increased from 4% to 15%. According to statistics, 30%~80% of obese Children and adolescence may develop obesity of adulthood. Relevant data of the world health organization (WHO)[2,3,4,5] show that obesity is not just a health hazard of chronic disease, and important dangerous factor of hyperlipidemia, II diabetes, cardiovascular disease, respiratory disease and other chronic non-communicable diseases (chronic) and social psychological barriers. This will lead to early death, disability, affect the quality of life and increase the financial burden of the global public health prob-

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lem. Dyslipidemia is evidence of stroke risk factors[6]. Therefore, overweight, obesity and other risk factors are bound to cause the damage of cerebral function, eventually lead to the occurrence of stroke. Hemodynamic is the new subject developed in recent years, hemodynamic factors are considered to be the key factor for atherosclerosis[7], and dyslipidemia is the comprehensive reflection of cerebral vascular structure and function damage, and the important mechanism of the stroke, as well as the "intermediate phenotype" from risk factors of exposure to the stroke[8]. Foreign literature reported[9, 10], Obscenity can lead to increase of renal blood flow and the glomerular ultra filtration, and may be associated with glomerular damage. In male patients with hypertension, micro-albuminuria more are seen in obscenity. According to a survey sponsored by the Beijing Municipal Children's Hospital in obese children winter camp, obese children often feel sleepy, class inattention. the learning of Severe obesity achieved general. Because of body fat, their movements were clumsiness, unresponsive, Obese children in collective activity by friends were make fun, amused, and even iresatired, so they didn't want to take part in social activities, these affected seriously their physical and mental health. Therefore, we understood the distribution of the overweight and obese children, cleared related factors of childhood obesity occurrence, which will provide effective help for prevention and control of obesity, is conducive to children's physical and mental health development.

RESEARCH PURPOSE

According to the national physique monitoring data obtained in 2010 in Hebei province, It summed up the current situation of overweight and obese children of 3-6 years old in Hebei Province in the age, gender, region and so on, It aimed to provide scientific basis for children's obesity prevention and control in Hebei province, and help for the promotion of national fitness program.

THE RESEARCH OBJECTS AND METHODS

The research objects

The objects of study were 3-6 years old children, from Shijiazhuang, Cangzhou, Chengde, Handan, Xingtai, Langfang, Hengshui, Baoding, Zhangjiakou, Tangshan, Qinhuangdao area of Hebei province, we used cluster random sample to test 6034 children. In every city children of two kindergartens were selected randomly as the objects of study.

Testing index and methods

According to the national physique monitoring indicators and methods, by the use of BMI (body mass index, BMI),

BMI=weight (kg)/[height (m)]^2,

This paper investigated overweight and obesity children. The evaluation index: 15<BMI<18 as "normal"; 18≤BMI<20 as "overweight"; 20≤BMI<22 as "mild obesity"; 22≤BMI<25 as "moderately obesity"; BMI≥25 as a "severe obesity".

Mathematical statistics

We used SPSS11.8 to count mean, standard deviation and columnar variation analysis, the purpose was to know the distribution of BMI of the different age stages for overweight and obese children of different regions and know well the distribution characteristics of overweight and obese children at 3-6 years old.

THE RESULTS AND ANALYSIS

In 2010, the BMI distribution of different age of overweight and obesity for 3-6 years old children in Hebei province

By the statistical results in TABLE 1 and Figure 1 showed: In 2010,at three years old, six years old, four point five years old, BMI of overweight and

TABLE 1 : The BMI distribution of different age of overweight and obesity

Age	3.0	3.5	4.0	4.5	5	5.5	6.0
BMI	20.29±2.20	19.44±1.44	19.67±1.77	19.95±2.00	19.71±1.37	19.71±1.77	20.19±2.11

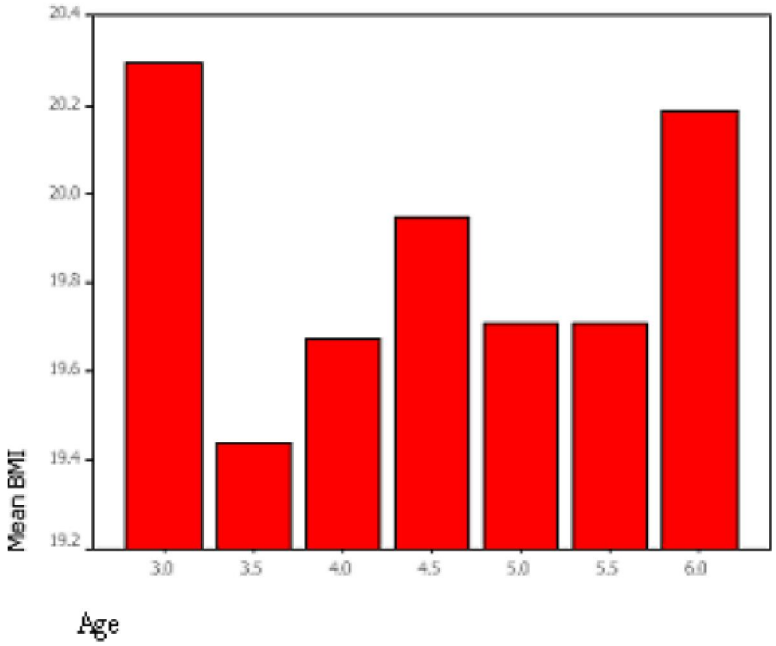

Figure 1 : The BMI distribution of different age of overweight and obesity

obesity children were high, The three years old children were highest, reached more than 20.29; Second, six children reached more than 20.19; The four point five years old children in the third, reached more than 19.95. But five point five years old were basically the same, reached respectively more than 19.67, 19.71, 19.71, and only three point five years old at least reached respectively more than 19.44. Thus it can be seen that overweight and obesity among children of different age stages were serious at six years old, in other age stages most were overweight.

The reason may be the children of three years old have just walked out of the family and went into the kindergarten, In addition to include irregular diet, higher intake of high energy materials, the basic activities were less. Research suggests that over nutrition is the main factor causing obesity, especially child obesity[11, 14]. For 6 years old children overweight and obesity ranked second, which related to preschool children at 6 years old. The 6 years old will enter a school, parents will give children a preschool preparation, In order to improve the improve the 6 years old children's mental and physical strength, Who especially increased nutritional supplement before going to sleep, which caused the accumulation of body fat.

Distribution characteristics of overweight and obese children between different regions at 3-6 years old

From TABLE 2 an d Figure 2, in 2010, BMI of overweight and obese children in Chengde areas at 3-6 years old were highest, reached more than 20.63, BMI of Cangzhou were second, reached more than 20.63; BMI of Qinhuangdao reached 20.24 in the third; Langfang, Shijiazhuang, Hengshui, Xingtai were respectively 19.91, 19.80, 19.96, 19.72; BMI of Baoding were minimum, only reached 18.76. According to the regional distribution, Qinhuangdao, Chengde as tourist cities the average obesity were obvious. As tourist cities, the economy is more developed, people's living standard is higher, more children eat snacks, which caused lack of nutrients, and lack of nutrients can cause obesity. A fat decompose process requires cooperation and participation of nutrients such as vitamin B6, vitamin B12, Nicotinic acid. If these nutrients intake is insufficient, fat decomposition will be influence differently, the accumulation of fat in the body result in obesity.

The change trend of overweight and obesity

Results in TABLE 3 show that: the overall overweight rate was 1.1% in 2000; the overall overweight rate was 0.2% in 2005; the overall overweight rate was 3.4% in 2010; which declined In 2005 than in

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TABLE 2 : Distribution characteristics of overweight and obese children between different regions at 3-6 years old

Region	Shijiazhuang	Langfang	Hengshui	Tangshan	Qinhuangdao	Handan	Xingtai	Baoding	Zhangjiakou	Chengde	Cangzhou
BMI	19.91±2.10	19.80 ±1.61	19.96 ±1.71	19.44 ±1.37	20.24 ±2.18	19.34 ±1.15	19.72 ±1.62	18.76 ±0.87	19.87 ±1.85	20.63 ±2.19	20.60 ±2.89

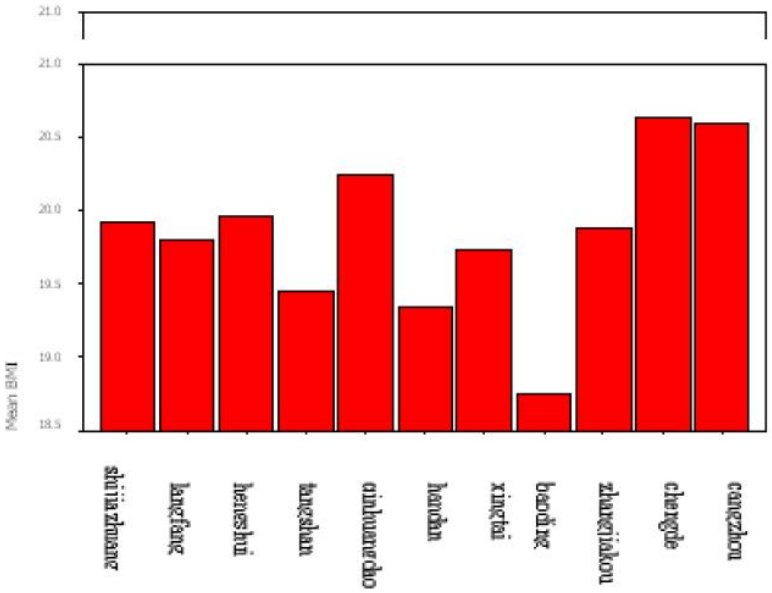

Figure 2 : Distribution characteristics of overweight and obese children between different regions at 3-6 years old

TABLE 3 : The overweight and obesity trend of 3 to 6 years old from 2000 to 2010

Year	The overall rate of overweight	Gender overweight rate	Overall rates of obesity	Obesity among gender
		Men women		Men women
2000	1.1	1.0 1.1	0.6	0.9 0.3
2005	0.2	0.3 0.2	0.2	0.2 0.2
2010	3.4	6.3 13.1	6.3	6.7 3.4

Note: Overweight rate=overweight/the total number of people; Obesity rates=Obesity/the total number of people; Obesity among gender rates=Different gender/the total number of people

2000, falling value of 0.9%; But in 2010 than in 2000 and 2005 the overall overweight rate had obvious rise, which increased by 2.2% in 2010 than in 2005; In 2000, the overweight rate of men and women was respectively 1.0% and 1.1%; which were 0.3% and 0.2% In 2005; 6.3% and 13.1% In 2010. It has obvious improvement in 2005 and in 2000.

In 2000 the overall obesity rate is 0.6%; In 2005 the rate is 0.2%; In 2010 the rate is 6.3%; Compared with 2000, in 2005 the rate is on the decline of 0.4%; But 2010 compared with 2000 and 2005, the rate had a significant rise, in 2010 than in 2005 the rate increased by 4.1%. In 2000, male and female obesity rate were respectively 0.9% and 0.3%; In 2005 which were 0.2% and 0.2%, 6.7% and 3.4% in 2010, had obvious ascension than in 2000 and 2005. The cause of obesity is the gradual improvement of living standard, high sugar, high fat, high caloric intake and the habit of eating snacks. And because of air quality, children live for a long time in indoor, outdoor activities decreased, the fat accumulation in the body was not consumed, the studies had shown that long-term regular exercise can improve basal metabolic rate of the quiet condition. Under the condition of a high-fat diet, when the exercise intensity and time reaches a certain level, muscle glycogen storage is reduced enough, and exercise can increase the energy consumption of sleep within 24 hours[12].

The activity survey of 3-6 years old children

It can be seen from TABLE 4, for 3-6 years old

TABLE 4 : The activity survey of 3-6 years old children

Age	3.0	3.5	4.0	4.5	5	5.5	6.0
Sleep time (h)	2.5±0.20	2.2±0.44	2.18±0.17	2.11±0.18	2.0±0.07	1.8±0.07	1.5±0.11
Activity of time every day (h)	2.0±0.12	1.5±0.24	1.45±0.13	1.47±0.08	1.6±0.04	1.8±0.11	2.1±0.01

children the sleep time gradually reduced, the sleep time reduced from2.5±0.20 hours to 1.5±0.11 hours, for children everyday activities time reduced gradually from 3 to 4.5 years old, and increased from 4.5 to 6 years old. These were related to the age gradient of the children, at a younger age, the cognitive ability, social ability is poor, and communication with the other children ability is also poor, in outdoors they play generally alone. However, as the growth of the age, communication ability is improved, a few children can play together because of common interests and hobbies, which increase the interest of outdoor activities, so outdoor activities are increased.

THE REASON OF OVERWEIGHT AND OBESITY CHILDREN AND SOLUTION STRATEGY

Over nutrition, high heat food intake too much

Obesity is a nutrient imbalance phenomenon, namely the nutrition excess or lack of certain nutrients, which will influence differently fat decomposition, the accumulation of fat in the body cause obesity[11, 13]. The size and quantity of the fat cells are also the important factors that affect the body fat. Increase of the number of fat cells is caused by former fat cells proliferation, differentiation, the reduction may cause by apoptosis of preadipocytes, adiposities or dedifferentiation[14]. The human adipose tissue has white adipose tissue and brown adipose tissue. White adipose tissue is the store of excess energy in the form of neutral fat storage, which decomposes to supply power when necessary. Brown adipose tissue is regarded as a special heat production tissue. Current research suggests that the occurrence of obesity may be associated with the low function of brown adipose tissue, when it produces heat dysfunction, Ingestion of the energy reduce in the form of heat emission, store fat in the body, which cause obesity[15].

Only child in China has increased year by year, the child is very spoiled by their parents, the food intake of children select according to their preferences, children like to eat all kinds of fried food, snack food, chocolate, biscuits, dairy products, sweets and so on, this kind of food have high quantity of heat. Eating the partial eclipse and the children are picky and partial eclipse eaters, who do not eat vegetables and fruit, which cause obesity. In addition, after three years old children add the number of meat, which is to increase the nutrition in the morning and evening, five meals a day, lead to the daily intake of calories far more than they actually need. Therefore, the correct choose of food, reasonable collocation, balanced diets are the key to prevent fat and reduce weight.

Physical exercise is too little

Due to the improvement of people's living standard, all kinds of vehicles instead of walking, when we go out by car, take the elevator when go home, in Home and kindergarten children are basically sitting. they everyday watch TV, play computer games for a long time, the energy is intake excessively and the consumption is reduced, the energy is accumulated in the body, which result in overweight or obesity; Exercise can not only make body composition be control within the normal range, but also can reduce the body fat storage. Exercise can cause the increase of catecholamine hormone secretion, It can also boost the lipless of adipose tissue[16, 17, 18]. At the same time exercise can reduce fat positive balance caused by low-fat and high-fat diet, inhibit the increase of the number of fat cells caused by excessive eating, reduce the volume of the cell; Long-term regular exercise can improve basal metabolic rate of the quiet condition; Under the condition of a high-fat diet, when the exercise intensity and time reaches a certain level, which will reduce enough muscle glycogen storage, and exercise can increase sleep energy consumption within 24 hours. Exercise and physical activity level is higher, body fat content is less. All forms of exer-

cise will increase fat oxidation, therefore, even if the parents have no time to accompany children to take part in physical exercise, they should try to increase the movement way of life, such as walking to the kindergarten, climbing stairs, at the same time fat is controlled and physique is enhanced.

CONCLUSIONS AND RECOMMENDATIONS

In 2010, at 3-6 years old overweight and obese children in Hebei province show that the two extremes: at 3 and 6 years old children obesity is serious; at other age stage most is overweight. According to the regional distribution, Qinhuangdao, Chengde as tourist cities the average obesity was obvious, Cangzhou was the second, Baoding was the minimum, and other regions had little difference. In 2000 and 2005 the overall overweight and obesity rate had obvious rise. For 3-6 years old children the sleep time reduced gradually, for children everyday activities time reduced gradually from 3 to 4.5 years old, and increased from 4.5 to 6 years old. Overweight, obesity is a continuous, gradual process from quantitative to qualitative change. Children of overweight and obesity are likely to become obese adults. It is imperative to prevent and reduce fat, so the prevention should begin from childhood, the good eating and exercise habits are cultivated, an ideal body weight will be maintained.

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