

## Overweight and Obesity Status of Children and Adolescents in Daur Ethnic Communities

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### Abstract

**Objective** To understand the overweight and obesity status of children and adolescents in Daur ethnic communities, and to provide references for the prevention and control of overweight and obesity in children and adolescents. **Methods** Using the height and weight data of children and adolescents aged 7~12 years old in Daur Autonomous Banner Ethnic Experimental Primary School in 2019 as indicators, using the "School-age Children and Adolescents Screening for Overweight and Obesity" evaluation system, the body mass index of children and adolescents in Daur ethnic minority areas was measured. Analyze and understand the status quo of his overweight and obesity. **Results** The average BMI of children and adolescents aged 7 to 12 in the Daur area was below the overweight value, but the overweight and obesity detection rates of all age groups were higher than 35%, and the overweight and obesity examination rates were 38.8%, 58.8%, and 43.9%, respectively, 48.2%, 44.6%, 46.8%. Among them, 7-year-old, 8-year-old and 10-year-old girls had higher average BMI than boys ( $P < 0.05$ ). **Conclusion** The detection rate of overweight and obesity in children and adolescents aged 7~12 years in the Daur ethnic area is relatively high. The detection rate of overweight and obesity in 9-year-old, 11-year-old and 12-year-old girls is higher than that of boys ( $\chi^2$  values are 20.9, 23.1, 23.8,  $P < 0.05$ ), the detection rate of overweight and obesity in boys aged 7, 8 and 10 was higher than that in girls ( $\chi^2$  values were 15.7, 25.5, 19.9,  $P < 0.05$ ), and targeted measures were taken to prevent and control overweight and obesity in children and adolescents Popular.

### Keywords

Daur nationality; Overweight; Obesity; Ethnic minorities.

### 1. Introduction

With the continuous development of my country's social economy, the material level of the people has been greatly improved[1], and the physical development level of children and adolescents in my country has continued to improve[2]. Height and weight reflect the physical development of the human body. Body mass index (BMI) reflects the relationship between height and weight, and is also one of the standards for measuring the degree of fatness and thinness of the human body [3].

The Daur ethnic group is one of the few ethnic groups in northern my country, with a total population of only 131,992 [4]. They mainly live in the Moli Dawa Daur Autonomous Banner of the Inner Mongolia Autonomous Region, the Meris Daur Ethnic Area in Qiqihar City, Heilongjiang Province, and the Ewenki Autonomous Region. flag area. Since the founding of the People's Republic of China, my country has organized the "National School Physical Fitness and

Health Research Work" and "National National National Physical Fitness Monitoring and Research Work" for many times, and the relevant survey and test results have achieved fruitful results, but so far no written reports involving Daur children and adolescents' physical and health surveys have been found. , and there is no report on the research results and information related to overweight and obesity among children and adolescents in the Daur community. Taking the opportunity of "Research on the Physical Fitness and Health of Children and Adolescents of Ethnic Minorities in my country" as an opportunity, the research team conducted a survey on the physical fitness and health of students in the National Experimental Primary School in Moli Dawa Daur Autonomous Banner, Inner Mongolia Autonomous Region in April 2019. Measurement of height, weight and other indicators, combined with BMI scores, to further understand the overweight and obesity status of children and adolescents in Daur inhabited areas, and to provide reference for the formulation of policies for children and adolescents in school hygiene, health, sports, etc. in Moli Dawa Daur Autonomous Banner .

## 2. Objects and Methods

### 2.1. Objects

In 2019, the research team went deep into the Moli Dawa Daur Autonomous Banner, and conducted data tests on physique and health of 524 students (260 boys and 264 girls, the specific data are shown in Table 1) aged 7 to 12 years old, in this paper, only the weight and height indicators of the test data are selected for analysis.

**Table 1.** The number of children and adolescents in the Daur area

Age Gender	7	8	9	10	11	12	total
Male	49	57	30	53	42	29	260
Female	55	55	46	46	39	23	264
Total	104	112	76	99	81	52	524

### 2.2. Methods

According to the relevant test standards and requirements of the "National Physical Fitness Measurement Bulletin", "National Student Physical Health Standards (Revised in 2014)" [5], and "Comprehensive Evaluation of the Developmental Level of Children and Adolescents"[6].It is divided into six levels, and measures such as height, weight, and vital capacity, and uses the screening evaluation criteria of "Overweight and Obesity Screening for School-aged Children and Adolescents"[7] to assess the overweight and obesity status of children and adolescents in the Daur community. Among them, all testers have undergone unified training, and the class teacher is required to participate in the whole process of the class test. The height was detected by a standard manual platen height detector with an accuracy of 0.1 cm; the weight was measured by an electronic weight detector with an accuracy of 0.1 kg; and 5% of the height and weight detection values were extracted daily for re-examination.

The formula for calculating body mass index is as follows:

$$\text{BMI} = \text{Weight}(\text{kg}) / [\text{Height}(\text{m})]^2$$

### 2.3. Statistical Analysis

The overweight and obesity standard of body mass index for children and adolescents is slightly different from that of adults in my country. This study adopted the "Overweight and Obesity Screening for School-aged Children and Adolescents" issued by the Health and Family Planning Commission of the People's Republic of China in 2018 to evaluate Daur. Overweight and obesity

among children and adolescents in ethnically populated areas. SPSS21.0 software was used to organize and statistically analyze the collected data. One-sample t-test and  $\chi^2$  test were performed on the mean BMI and the detection rate of overweight and obesity in children and adolescents in Daur inhabited areas.  $P < 0.05$  was considered statistically significant.

### 3. Results

#### 3.1. BMI Screening of Children and Adolescents in Daur Inhabited Areas

The mean BMI of boys and girls at all ages was below the overweight value. The mean BMI of girls was equal to the mean BMI of boys at the age of 9 and 11 [(18.0±3.9), (18.7±3.6) kg/m<sup>2</sup>], while the mean BMI of girls at the age of 9 and 11 was equal to that of boys [(18.0±3.9), (18.7±3.6) kg/m<sup>2</sup>]. The mean BMI of 8-year-old and 10-year-old girls was greater than that of boys (t values were 0.51, -0.55, 0.50,  $P < 0.05$ , respectively).

**Table 2.** BMI screening of children and adolescents in the Daur area (unit: kg/m<sup>2</sup>)

Age	Sex	Number	BMI	T	P
7	Male	49	16.5±3.0	0.23	0.00
	Female	55	16.6±3.0	0.51	
8	Male	57	17.2±2.8	-0.54	0.03
	Female	55	17.2±2.7	-0.55	
9	Male	30	18.0±3.9	0.28	0.76
	Female	46	18.0±3.9	0.35	
10	Male	53	18.7±3.9	0.19	0.04
	Female	46	18.9±4.1	0.50	
11	Male	42	18.7±3.6	-0.54	0.95
	Female	39	18.7±3.6	-0.52	
12	Male	29	18.2±3.0	-1.26	0.78
	Female	23	18.6±3.4	-0.42	

#### 3.2. Detection Rate of Overweight and Obesity Among Children and Adolescents in The Daur Community

The detection rate of overweight and obesity in children and adolescents of all ages in the Daur ethnic group was >35%, and the detection rates of overweight in boys were 16.3%, 15.8%, 6.7%, 5.7%, 11.9%, and 13.8%. The detection rates were 6.1%, 15.8%, 13.3%, 20.8%, 7.1%, and 6.9%, respectively; the overweight detection rates of girls in all age groups were 10.9%, 18.1%, 6.5%, 8.7%, 12.8%, and 26.1%, respectively; Obesity detection rates were 5.5%, 9.1%, 17.4%, 13.0%, 12.8%, and 0%, respectively. Among them, the detection rate of overweight and obesity in 9-, 11-, and 12-year-old girls was higher than that in boys ( $\chi^2$  values were 20.9, 23.1, 23.8,  $P < 0.05$ ); overweight and obesity in boys at 7, 8, and 10 years old were detected The rate was higher than that of girls ( $\chi^2$  values were 15.7, 25.5, 19.9,  $P < 0.05$ ). Girls are more overweight than boys in all age groups except boys aged 7 and 9. However, obesity rates were higher for boys than girls in all age groups except girls aged 9 and 11. Seven-year-old boys and 12-year-old girls had the highest detection rates of overweight, and 10-year-old boys and 9-year-old girls had the highest detection rates of obesity.

**Table 3.** The detection rate of overweight and obesity among children and adolescents in Daur inhabited areas (%)

Sex	Age	Number	Overweight	Obesity	Total
Male	7	49	16.3	6.1	22.4
	8	57	15.8	15.8	31.6
	9	30	6.7	13.3	20.0
	10	53	5.7	20.8	26.5
	11	42	11.9	7.1	19.0
	12	29	13.8	6.9	20.7
Female	7	55	10.9	5.5	16.4
	8	55	18.1	9.1	27.2
	9	46	6.5	17.4	23.9
	10	46	8.7	13.0	21.7
	11	39	12.8	12.8	25.6
	12	23	26.1	0	26.1

#### 4. Discussion

With the continuous improvement of living standards and a series of changes in lifestyles, the physical activity level of children and adolescents is obviously insufficient, resulting in a series of problems such as overweight and obesity, which has become a hot spot in the fields of education, health, and health at home and abroad. Among them, obesity and overweight are one of the global chronic diseases. Relevant studies have shown that the obesity rate of residents in Europe, America, China and North Africa has increased by 3 to 5 times in the past 10 years, while the growth rate of obesity rate in developing countries has exceeded that in developed countries[8], especially in children and adolescents, the problem of overweight and obesity is the most significant[9]. According to statistics from European and American countries, the global overweight and obesity rate of school-age children reached 10% in 2004, and the overweight and obesity rate of children in China and Western countries has increased nearly 2-3 times in the past 20 to 30 years[10]. From 1985 to 2010, the detection rate of overweight in children and adolescents aged 7-18 years in my country increased from 1.11% to 9.62%, and the detection rate of obesity increased from 0.13% to 4.95%[11]. Therefore, the problem of overweight and obesity among children and adolescents in my country is prominent.

The data of this study show that children and adolescents of all age groups in the Daur Autonomous Banner National Experimental Primary School have reached the level of overweight and obesity, which is significantly higher than the average level of children and adolescents in my country[12]. The results showed that the total overweight and obesity rates of boys and girls aged 7 to 12 were higher than 16.4%. This may be related to the lack of awareness of body shape control in children and adolescents aged ~12 years, and the influence of body shape by genetics, environment, dietary habits, and physical activity, resulting in individuals not paying enough attention to overweight and obesity, and prone to overweight and obesity. Moreover, related studies have shown that parental overweight and obesity are closely related to childhood and adolescent overweight and obesity[13-16]. Among them, parental obesity can cause damage to the growth and development, metabolism, and nervous system of the offspring, and easily lead to the occurrence of metabolic diseases such as obesity and overweight, which has a serious impact on the healthy growth of offspring[17]. Some studies have shown that if either parent is obese, the probability of obesity in the offspring is about 40%, and if both parents are obese, the probability of obesity in their children can reach

70%-80%. Obesity is related to genetics[18]. However, the Daur people live in the northern region, and their daily diet is mainly meat. In addition, the climate and temperature are relatively low and the cycle is long, and physical activity is insufficient, resulting in increased body fat accumulation and rounded body shape in adult men and women[19]. Therefore, the high detection rate of overweight and obesity in children and adolescents in the Daur area may be related to parental obesity or genetics.

The detection rate of obesity in children and adolescents aged 9-10 years was significantly higher than that of overweight, which may have a greater impact on overweight and obesity. Because the Daur people prefer to eat dairy products and meat, it directly or indirectly leads to a significant increase in height, weight and other indicators, and the situation of excess nutrition appears[20]. Among them, living in such a high-fat, high-protein diet for a long time can easily lead to overweight and obesity in Daur children and adolescents. Relevant research shows that the eating time, physical activity, and dietary structure of children and adolescents are closely related to overweight and obesity. Living habits and eating habits are all important factors leading to overweight and obesity[21]. Therefore, the high rates of overweight and obesity among children and adolescents in Daur inhabited areas may be related to their parents' living and eating habits.

In an environment of increasingly fierce social competition, parents, teachers and society have high expectations for school-aged children and adolescents, which invisibly puts enormous pressure on children and adolescents both physically and mentally. Because many schools, parents, etc., pay too much attention to the superficial level of scores, neglect the cultivation and exercise of physical development of children and adolescents, coupled with the influence of internal and external factors such as academics and the environment, resulting in frequent problems in children and adolescents in terms of physical quality, physical and mental health, etc. Therefore, attention should be paid to the healthy development of children and adolescents[22]. Among them, the educational conditions in ethnic areas are relatively poor, which is not in line with the educational expectations of children in Daur inhabited areas. Coupled with changes in production, living, and learning methods, the physical activity of children and adolescents in the inhabited areas has dropped significantly. Nearly half of the students Outdoor physical activity is less than 1 hour per day[23], which may be one of the reasons for overweight and obesity.

Environmental factors have a significant impact on human growth and development. Under different geographical environments and natural climatic conditions, there are certain differences in the growth and development levels of children and adolescents, and the morphological characteristics of different ethnic groups are related to the adaptability of the environment[24]. Relevant studies have shown that the level of growth and development is highly correlated with the dimensions of the earth, temperature and temperature difference, and annual sunshine hours, while it has a significant negative correlation with average temperature, average relative humidity, and annual precipitation[25]. As the Daur Autonomous Banner belongs to the mid-temperate semi-humid continental climate, summer is hot and humid, rainy, and winter is dry and cold. The highest temperature reaches 36.8°C and the lowest temperature is -46°C. Therefore, children and adolescents in the Daur inhabited area have more subcutaneous fat and better skeletal muscle development. This body type can resist the cold in winter and achieve the effect of keeping warm. This also reflects that human beings can produce environmental effects according to different climatic conditions. long-term adaptability.

To sum up, the overweight and obesity phenomenon among children and adolescents in the Daur inhabited areas is relatively serious. The detection rate of overweight and obesity in boys and girls varies, but they all exceed the national standard. Among them, genetics, dietary habits, academic pressure and living environment all have a certain impact on the overweight and

obesity problem of Daur children and adolescents. Control and prevent the occurrence of overweight and obesity in children and adolescents from the root cause: first, improve the health awareness of children and adolescents, develop good exercise habits, and have a balanced diet; second, create a good family atmosphere, so that children can develop a good life. Third, schools and parents should attach importance to physical exercise, and ensure that colleagues who have full physical education classes will ensure that children "exercise one hour a day"; fourth, government departments should issue corresponding policies and regulations to control and prevent children and adolescents. The emergence of overweight and obesity has increased publicity efforts. The health of children and adolescents is related to the future of the nation, and the problem of overweight and obesity in children and adolescents cannot be ignored. As Daur is one of the minority ethnic groups in my country, the overweight and obesity of its children and adolescents is directly related to the quality of population health and is an important part of the national strategy for a healthy China. In the next step, the research group will conduct in-depth investigations to investigate the relevant influencing factors of overweight and obesity among children and adolescents in the Daur community, closely monitor the development trend of overweight and obesity, and formulate practical prevention and control programs.

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