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Letter to the Editor

Obesity and Its Relation to Eating Habits among Rural-to-Urban Migrant Children in Shanghai, China

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Dear Editor-in-Chief

With the growing of urbanization, the prevalence of overweight and obesity among migrants in developing countries has increased rapidly (1). Urban and rural-to-urban migrant individuals are at higher risk of obesity in developing settings, particularly in children and adolescents (2). This status has definitely become a serious public health concern that needs to be addressed.

In China, the number of rural-to-urban migrant children under the age of 17 has exceeded 35 million by 2015 (3). Overweight and obesity are increasingly observed in this population as it continues on an upward trend (4). To our knowledge, numerous studies on children and adolescents have indicated the relationship between obesity and eating habits (5). However, assessment of eating habits among rural-to-urban migrant children has seldom been conducted. Therefore, this study aimed to examine the relationship between obesity and eating habits of rural-to-urban migrant children in Shanghai, China.

In Apr 2018, we conducted a cross-sectional survey in Shanghai. Shanghai City was divided into 3 parts (Downtown, Suburbs, Outer Suburbs), a multistage, random cluster sampling method was performed. Two public primary schools were selected randomly from each parts (Fig. 1). Six public primary schools and about 5600 children were surveyed. Excluding invalid questionnaires (238) and some students that were absent from the test (343), the final sample included 5019 children aged 7-13 yr old (2730 Boys and 2289 Girls). Anthropometric measurements and questionnaire investigations were conducted after parents of all subjects had informed consent. Questionnaire investigations included the frequency of breakfast, Snacks, Soft drink and whether picky eater. Anthropometric measurements included height and weight when children were under a light dress. We calculated BMI according to the formula: weight (kg)/height (m^2), and wasting weight, normal weight, overweight and obese weight were defined using Chinese children and adolescent Standards for BMI. Since this study only considered obesity, the analysis of the underweight group and the overweight group were excluded. All statistical analyses were performed using SPSS 26.0 (IBM, Armonk, NY, USA). Chi-square test was used to compare the differences between categorical variables and BMI standards.

Fig. 1: Location of the areas in where the study was conducted

Logistic regression was used to analyze the association between eating habits and obesity. This study was approved by the Ethics Committee of School of Physical Education and Health of East China Normal University.

For the general characteristics of all participants, we found the overall prevalence of obesity was 11.5%, the obesity rate in boys was to be much higher than girls (boys 13.8%, girls 8.8%). In terms of age, regardless of gender, 10-year-old has the highest incidence of obesity in all age range.

To verify the relationship between eating habits and obesity, we compared the eating habits of the Normal weight group and the Obesity group by $\chi 2$ (Table 1).

Table 1: Comparison of eating habits between normal weight and obesity

	Normal weight *(N=3317, 66.1%)*	***Obesity*** *(N=577, 11.5%)*	***χ2***	***P***
Breakfast			5.280	0.071
Almost every day (≧ 4 times/wk)	3037(91.6%)	513(88.9%)		
Some days (2~3 times/wk)	204 (6.2%)	43 (7.5%)		
Rarely(≦ 1 times/wk)	76 (2.3%)	21(3.6%)		
Snacks			0.7870	0.675
Almost every day (≧ 4 times/wk)	751 (22.6%)	123(21.3%)		
Some days (2~3 times/wk)	2035 (61.4%)	355(61.5%)		
Rarely (≦ 1 times/wk)	531 (16.0%)	99 (17.2%)		
Soft drink			22.638	<0.001
Almost every day (≧ 4 times/wk)	280 (8.4%)	66 (11.4%)		
Some days (2~3 times/wk)	1714 (51.7%)	339(58.8%)		
Rarely (≦ 1 times/wk)	1323 (39.9%)	172(29.8%)		
Picky eaters			44.673	<0.001
Not	819 (24.7%)	218(37.8%)		
Sometimes	1903 (57.4%)	285(49.4%)		
Often	595 (17.9%)	74 (12.8%)		

These were significantly different (P<0.05) with the frequency of soft drink intake and picky eating. We conducted the logistic regressions for both selected eating habits and obesity. There was a positive relationship (P<0.05) with soft drink consumption and obesity (OR=1.67, 95%CI=1.21-2.29), so increasing soft drink intake would create a greater probability of obesity. There was also a positive relationship (P<0.05) in regards to picky eating. Children who weren't picky eaters were more likely to be obese (OR=2.34, 95%CI=1.75-3.13) than those who were.

Regardless of gender, the prevalence of obesity among rural-to-urban migrant children was associated with eating habits in this study, with increasing soft drink consumption there was a greater probability of obesity. Furthermore, those children who were not picky eaters were more likely to be obese than those who were.

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Conflict of interest

The authors declare that there is no conflict of interest.

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