Survey of nutrition-related KAP levels in children and adolescents with early-onset severe obesity in Qinhuangdao city

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Abstract

Objective: To investigate the nutrition-related knowledge, attitude and practice levels of children and adolescents with early severe obesity, and to analyse the influencing factors.

Method: The cross-sectional study was conducted from January 2022 to January 2023 in Qinhuangdao city, China, and comprised children and adolescents with early-onset severe obesity. Based on the median nutrition-related knowledge, attitude and practice level, the subjects were divided into a 'high' group A and 'low' group B. The baseline data of the two groups was compared, and the relevant factors affecting nutrition-related knowledge, attitude and practice levels were analysed. Data was analysed using SPSS 22.

Results: Of the 250 subjects, 127(50.8%) were females, 123(49.2%) were males, 79(31.6%) were aged >14 years, 70(28%) 6-14 years, 69(27.6%) 2-6 years and 32(12.8%) were <2 years. There were 127(50.8%) subjects in group A and 123(49.2%) in group B. The overall mean knowledge, attitude and practice score was 12.52±2.38 (range: 6-19), with median score 13(IQR=4). Body shape assessment, parental obesity, and parents' education level were the influencing factors of nutrition-related knowledge, attitude and practice levels ($p<0.05$).

Conclusion: Children and adolescents with early-onset severe obesity in Qinhuangdao were found to have a medium level of nutrition-related knowledge, attitude and practice, and the level was influenced by body shape assessment, parental obesity and parental education level.

Key Words: Severe obesity, Children. Adolescents, Knowledge, Attitude, Practice, Influencing factors.

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Introduction

Recent years have witnessed socioeconomic development and changes in people's lifestyles, and with it the growing problem of childhood and adolescent obesity, which has become a global public health challenge. Early-onset severe obesity undermines the physical and mental health of children and adolescents, and may even be associated with a series of chronic diseases, such as cardiovascular diseases (CVDs) and diabetes mellitus (DM).[1,2] Knowledge, attitude and practice (KAP) is considered a key indicator for assessing the nutritional health status of an individual or group.[3,4] To this end, the nutrition-related KAP levels of children and adolescents with early-onset severe obesity should be recognised as an element of great significance for the development of targeted interventions, improvement of their nutritional status, and prevention and control of obesity.[5]

The current study was planned to investigate the nutrition-related KAP levels of children and adolescents with severe early-onset obesity, and to analyse the influencing factors.

Subjects and Methods

The cross-sectional study was conducted from January 2022 to January 2023 in the Chinese city of Qinhuangdao, which is a major coastal city and is representative of China's economic development level and lifestyle. After approval from the institutional ethics review board, the sample size was calculated at 10 times of 20 research variables, with a 25% expected loss to follow-up.[6]

Those included were children and adolescents of either gender with early-onset severe obesity. Early-onset severe obesity was defined as body mass index (BMI) >25kg/m^2 for children aged <2 years, >30kg/m^2 for age 2-6 years, 35kg/m^2 for age 6-14 years, and >40kg/m^2 for age >14 years[7]. The subjects had binge eating behaviours, consuming a large amount of food in a short period of time that exceeded the body's normal digestive capacity. Informed consent from their parents/guardians was acquired.

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Those with coexisting genetic syndrome, drug-induced weight-gain (such as glucocorticoids, sodium valproate, risperidone, etc.), Cushing's syndrome, and other causes of obesity were excluded, and so were those with primary mental illness, consciousness disorders and cognitive impairments.

The sampling method adopts multi-stage stratified random cluster sampling, A total of 6 schools (2 primary schools, 2 junior high schools, and 2 high schools) in Qinhuangdao city were randomly selected. Formal permission was obtained from the school management boards and the Qinhuangdao Municipal Education Bureau prior to the commencement of the study. One class is randomly selected from each grade, and the survey is conducted on a class by class basis, with no less than 10 people in each grade.

Based on the Dietary Guidelines for Chinese Residents,[8] a self-designed questionnaire was generated, and was shared with six experts who conducted three rounds of consultation to form a revised version of the questionnaire. Based on the pre-survey version, the questionnaire was revised again, leading to the final version. The questionnaire's reliability was tested before data collection. Pearson's correlation analysis was used for test-retest reliability, and Cronbach's alpha (α) coefficient was used to test the internal consistency of the questionnaire. A random sample of 268 children and adolescents was handed the questionnaire, and it was redistributed to the same subjects two weeks later. The correlation of the two surveys resulted in r=0.76 (p<0.05), indicating moderate reliability. The test-retest reliability was 0.76, indicating good reliability. Cronbach's α value >0.7 indicated good internal consistency of the questionnaire.

The questionnaire included basic information, like age, gender, per capita household income, single child, daily outdoor activity time, left-behind children, body shape assessment, paternal obesity, mother's education level, father's education level, and the daily outdoor activity time. In the nutrition-related knowledge section, each correct answer was scored 1, and an incorrect answer was scored 0. Nutrition-related attitudes were scored 3, 2 and 1 in the order of positive, general and uninterested. Dietary practices were scored 0 and 1 points according to the reasonableness of the options. The total score of the questionnaire ranged 0-23 points, with higher answer scores indicating better nutrition-related knowledge, more positive nutrition-related attitudes, and more reasonable dietary practices. Nutrition-related knowledge score <6 indicated low score, ≥6 indicated high score, and nutrition-related practices were divided into three grades: good (6-8 points), moderate (4-5 points), and poor (1-3 points).[9] Based on the median nutrition-related KAP level, the enrolled subjects were divided into a 'high' group A and a 'low' group B.

All the investigators were trained prior to the survey. The on-site survey was completed within 7 days.

Data was analysed using SPSS 22. Enumeration data was expressed as frequencies and percentages, and chi-square test was used for statistical analysis. The data was subjected to normality testing using Kolmogorov-Smirnov test, and the data that conformed to normal distribution was expressed as mean +/- standard deviation. Binary logistic regression for multivariate analysis was used. The KAP level was taken as the dependent variable, with low nutritional KAP level being scored 1, and high nutritional KAP level being scored 2. The factors with statistically significant differences in univariate analysis were taken as independent variables for multiple linear regression analysis. P<0.05 was considered statistically significant.

Results

Of the 250 subjects, 127(50.8%) were females, 123(49.2%) were males, 79(31.6%) were aged >14 years, 70(28%) were aged 6-14 years, 69(27.6%) were aged 2-6 years and 32(12.8%) were aged <2 years. There were 127(50.8%) subjects in group A and 123(49.2%) in group B. The overall mean KAP score was 12.52±2.38 (range: 6-19), with median score 13(IQR=4). Univariate analysis revealed significant differences between the groups related to left-behind children, body shape evaluation, parental obesity, maternal and paternal education level (p<0.05) (Table 1).

Table-1: Distribution of basic characteristics in relation of knowledge, attitude and practice (KAP) status of the subjects.

Indicators	Low nutrition-related KAP level group (n=123)	High nutrition-related KAP level group (n=127)	χ2	P
Age				
Under 2 years old	14 (11.38)	18 (14.17)	0.232	0.630
2–6 years old	35 (28.46)	34 (26.77)		
6–14 years old	34 (27.64)	36 (28.35)		
>14 years old	40 (32.52)	39 (30.71)		
Gender				
Male	64 (52.03)	59 (46.46)	0.777	0.378
Female	59 (47.97)	68 (53.54)		
Per capita household income	12 (9.76)	10 (7.87)	2.155	0.142
<3000RMB	81 (65.85)	74 (58.27)		
3000–5000RMB	30 (24.39)	43 (33.86)		
>5000RMB	12 (9.76)	10 (7.87)	2.155	0.142

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Left-behind children				
Yes	43 (34.96)	26 (20.47)	6.563	0.010
No	80 (65.04)	101 (79.53)		
Single child				
Yes	13 (10.57)	24 (18.9)	3.437	0.064
No	110 (89.43)	103 (81.1)		
Body shape assessment				
Satisfied	93 (75.61)	65 (51.18)	16.033	<0.001
Unsatisfied	30 (24.39)	62 (48.82)		
Paternal obesity				
Yes	18 (14.63)	4 (3.15)	10.269	0.001
No	105 (85.37)	123 (96.85)		
Mother's education level				
Elementary school and above	38 (30.89)	22 (17.32)	26.474	<0.001
Junior high school/High school /Secondary school	82 (66.67)	73 (57.48)		
College and above	3 (2.44)	32 (25.2)		
Daily outdoor activity time				
<1h	16 (13.01)	16 (12.6)	0.091	0.763

Table-2: Assignment status of individual variables.

Variables	Assignment
Nutrition-related KAP levels	1=Low nutrition-related KAP level, 2=high nutrition-related KAP level
Left-behind children	1=Yes, 2=No
Body shape assessment	1=Satisfied, 2=Dissatisfied
Parental obesity	1=Yes, 2=No
Father's education level	1=Elementary and above, 2=Junior high school/High school/Secondary school, 3=College and above
Mother's education level	1=Elementary and above, 2=Junior high school/High school/Secondary school, 3=College and above

KAP: Knowledge, attitude and practice.

Table-3: Binary logistic regression parameters affecting the level of nutrition-related KAP.

Variables	B	S.E.	Wald	P	5% C.I.	
					Lower limit	Upper limit
General situation						
Left-behind child	0.673	0.353	3.642	0.056	1.96	0.98
Body shape assessment (dissatisfied)	-0.973	0.314	9.616	0.002	0.38	0.20
Parental obesity	1.657	0.654	6.413	0.011	5.24	1.45
Father's education level						
Junior high school/High school/Secondary school	-0.865	0.407	4.506	0.034	0.42	0.19
college and above	-2.218	0.559	15.770	<0.001	0.11	0.04
Mother's education level			16.078	<0.001		
college and above	-0.231	0.358	0.418	0.518	0.79	0.39
Junior high school/High school/Secondary school	-2.687	0.688	15.257	<0.001	0.07	0.02

KAP: Knowledge, attitude and practice, CI: Confidence interval, SE: Standard error.

Binary regression analysis showed that self-evaluation of body shape (dissatisfaction), parental obesity, father's education level (junior high school or above), and mother's education level (university or above) were the influencing factors of nutritional KAP level ($p<0.05$) (Tables 2-3).

Discussion

Obesity may result in an increased risk of chronic diseases, such as CVDs and DM in children and adolescents, and may also affect their mental health and social adaptability.[10,11] This is a challenge that deserves sufficient attention from parents and society, and positive and effective measures should be taken for its prevention and treatment. Nutrition-related KAP, as a theoretical framework used extensively in the field of nutrition, embraces the three dimensions of nutrition-related knowledge, attitudes and practices. It finds significant application in the field of nutrition.[12,13] Promoting and practicing nutrition-related KAP is a way to prevent nutrition-related diseases, and to promote health by raising people's nutritional literacy and ameliorating their dietary habits and lifestyles.

The 250 patients with early-onset severe obesity in the Chinese city of Qinhuangdao recruited in the current study showed that the nutrition-related KAP was at a medium level. The finding was consistent with earlier reports.[14] The current findings also suggested a need to improve the overall level of nutrition-related KAP among children and adolescents with early-onset severe obesity. Specifically, nutrition-related education and guidance should be strengthened to establish healthy eating and living habits to improve the obesity status.

In the present study, univariate analysis revealed no significant differences between the two groups in age, gender, per capita household income, single child, and daily outdoor activity time, suggesting that children and adolescents, irrespective of their age, gender, family background, or single child status, were generally

deprived of nutrition-related knowledge, correct dietary attitudes, and healthy dietary practices. The reasons for this may be attributed to the insufficient attention paid to nutrition education by society, and the lack or insufficient depth of education in this area by families and schools. However, the study showed significant differences between the two groups with respect to left-behind children, body shape assessment, paternal obesity, mother's education level, and father's education level, suggesting that these factors may have an impact on the children's nutrition-related KAP levels. This was in line with earlier findings.[15] The reasons for this may be several. The level of parental education may shape the extent to which children understand and value nutrition-related knowledge. Highly-educated parents have a greater likelihood to deliver education on healthy eating to their children and help them form good eating habits.[16,17] Parental obesity may add to the risk of obesity in children. This genetic factor may result in a child being more susceptible to nutrition-related problems, such as poor eating habits and physical inactivity, all of which in turn undermine the child's nutrition-related KAP levels.[18] Left-behind children tend to develop deficiencies in nutrition-related knowledge and practices as a result of the lack of direct parental supervision and education, in which case their nutrition-related KAP levels may be comparatively low. Negative body shape assessment may contribute to children's feelings of inferiority, affecting their self-confidence and motivation, which may demotivate them to have nutrition-related knowledge and practices.[19] Likewise, it can be concluded that children with lower levels of body shape assessment may be less inclined towards nutrition-related KAP levels.

Further, the binary logistic regression model analysis in the current study showed that body shape assessment (dissatisfied), parental obesity, father's education level (junior high school and above), and mother's education level (college and above) were the influencing factors of nutrition-related KAP levels. There may be several reasons for this. First, children and adolescents' dissatisfaction with their body shape assessment may lead to unhealthy methods of weight reduction, such as over-dieting or over-exercising, which tend to induce nutritional imbalance and physical health problems.[20] This dissatisfaction may additionally be detrimental to the self-confidence and mental health of children and adolescents, further affecting their nutrition-related KAP levels. Second, parental obesity is a major risk factor for obesity in children and adolescents. Obesity has been shown to be of a certain family aggregation nature. Children with obese parents are far more likely to become obese.[21] This may be attributed to various factors, such as genetic factors, family eating habits, and lifestyle. Parental obesity may result in children being more exposed to unhealthy eating habits and lifestyles, thereby increasing the risk of developing obesity. The father's education level as well is of great importance in influencing the nutrition-related KAP levels among children and adolescents. A highly educated father may be more capable of advising his child on scientific and rational dietary advice and lifestyle guidance.[22] Such a father may also be more attentive to his child's nutritional health and guide his child accordingly. Lastly, the mother's education level makes a big difference in her child's nutrition-related KAP levels. Mothers with higher levels of education are in a better position to provide their children with a comprehensive and balanced diet, as well as scientific knowledge of nutrition. Mothers also take a more important role in their children's daily lives, both in terms of their eating habits and their lifestyles, which has a more direct and far-reaching impact on their children.

The current study has limitations, as it had it's a small sample raised from a single centre. Multicentre, prospective studies with larger samples are needed to validate the current findings.

Conclusion

Children and adolescents with early-onset severe obesity in Qinhuangdao were found to have a medium level of nutrition-related KAP. Body shape assessment (dissatisfaction), parental obesity, father's education level (junior high school and above), and mother's education level (college and above) were the influencing factors of nutrition-related KAP levels.

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MW & JH: Design the study and final approval.
DT & ZL: Data collection, analysis and final approval.
NC & HW: Writing and final approval.