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Effects of Scientific Dietary Guidance Combined with Exercise Guidance on Body Fat and Growth Indicators in Obese Children

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Abstract: *Objective:* To analyze the actual effect of scientific dietary guidance combined with exercise guidance in the intervention of obese children on their body fat indicators and growth indicators. *Methods:* From January 2025 to December 2025, 68 children whose physical development was evaluated as obese were found in the health management of children aged 0-6 in our hospital. They were divided into two groups using the random number table method, with 34 cases in each group. The control group received routine health intervention, and the observation group received scientific dietary guidance combined with exercise guidance based on the control group. The changes in body fat indicators and growth indicators before and after the intervention were compared between the two groups. *Results:* After the intervention, the improvement in body fat percentage, weight, and BMI indicators in the observation group was better than that in the control group ($P < 0.05$). *Conclusion:* The intervention model of scientific dietary guidance combined with exercise guidance can improve the current status of body fat accumulation and growth and development-related indicators in obese children, and is suitable for use in the health management of obese children.

Keywords: Obese children; Dietary guidance; Exercise guidance; Body fat index; Growth index

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1. Introduction

The continuous improvement of social and economic levels has caused changes in residents' daily diet structure and lifestyle. The intake of high-calorie and high-fat foods has increased and the time for outdoor activities has continued to decrease, resulting in a year-by-year increase in the number of children with obesity [1]. Obesity in children not only causes abnormal body shape, but also interferes with children's normal growth and development, increases the incidence of metabolic diseases such as hypertension, hyperlipidemia, and insulin resistance, which will have a negative impact on children's physical and mental health and future quality of life. At this stage, most clinical interventions for childhood obesity rely on

basic health education. The overall intervention method is relatively simple and cannot provide systematic control over the two main triggers: diet and exercise. As a result, many obese children have unsatisfactory improvements in body fat and weight, and relapse often occurs after the intervention is completed [2]. Dietary imbalance and lack of exercise are two major risk factors for childhood obesity. Targeted dietary intervention can correct children's wrong eating habits and reasonably control caloric intake. Standardized exercise guidance can increase the body's caloric consumption rate and promote body fat metabolism [3]. The purpose of this study is to explore the application effect of scientific dietary guidance combined with exercise guidance in obese children and its impact on body fat and growth indicators.

2. Materials and methods

2.1. General information

From January 2025 to December 2025, 68 children whose physical development was evaluated as obese were found in the health management of children aged 0-6 in our hospital. They were divided into two groups using the random number table method, with 34 cases in each group. The control group consisted of 18 males and 16 females, aged 0 to 6 years old, with an average age of (3.21 ± 1.05) years. There were 19 males and 15 females in the observation group, aged 0 to 7 years old, with an average age of (3.47±1.12) years. The data of the two groups are similar $P > 0.05$, indicating comparability. Inclusion criteria: (1) Meet the diagnostic criteria for childhood obesity; (2) Infants and preschool children aged 0 to 6 years old; (3) Families of children with informed consent and consent to participate in the study. Exclusion criteria: (1) Secondary obesity caused by endocrine diseases; (2) Existing limb movement dysfunction that prevents cooperation with exercise intervention; (3) Combined with severe organ diseases or mental cognitive abnormalities.

2.2. Method

The control group was given routine intervention measures for childhood obesity. Medical staff carried out basic health education for children and their families, briefly explaining the harm that obesity can bring to children's growth and development, informing them of the basic points of daily diet and the practical significance of moderate exercise, instructing family members to supervise children to reduce their intake of snacks and sweets, and encouraging children to participate in daily outdoor activities.

The observation group implemented scientific dietary guidance combined with exercise guidance intervention on the basis of the control group, and continued the intervention for 3 months. The specific intervention content is as follows.

(1) Scientific dietary care operation

The nursing staff collects basic dietary information such as the children's daily food intake, snack types, drinking conditions, meal times, etc., records the types of foods that the children love and resist daily, calculates the total daily calorie requirements based on the child's height, weight and obesity level, splits the calorie distribution ratio of the three meals, and sets the calorie ratio for breakfast to 30%, lunch to 40%, and dinner to 30%. The nursing staff demonstrated to the family members on-site the approximate amount of daily food ingredients, informed the family members of the actual grams of raw weight, lean meat, eggs, and vegetables for each meal, and guided the family members to give priority to replacing some refined rice and noodles with miscellaneous grains. The amount of vegetables in each meal must be sufficient. For

meat, fish, shrimp, lean beef, and chicken breast are preferred to reduce fat intake. The nursing staff gave practical cooking tips to the family members. They used a quantitative oil pot and a quantitative salt spoon when cooking. They strictly controlled the total daily amount of fat and salt added, and it was forbidden to make fried, braised and other high-oil dishes. The nursing staff assists the family members in planning the children's daily eating times, fixing the breakfast, lunch, and dinner times. The children are not allowed to eat snacks before and after meals. No eating behavior is allowed two hours before going to bed at night. Sugary drinks are completely replaced with boiled water, and the supply of puffed food and cream desserts is stopped. The nursing staff distributes paper diet registration forms and teaches family members to truthfully record the children's three meals and snacks every day. The forms are collected during each follow-up visit. The nursing staff checks the dietary implementation, points out excessive eating and unreasonable food choices on the spot, gives suggestions for adjustments, and fine-tunes the food portions every two weeks based on changes in the child's weight.

(2) Exercise nursing operations

The nursing staff determines the corresponding exercise items and exercise duration for each child based on the child's age, physical activity ability, and daily exercise foundation. Children aged 0-3 years old mainly focus on activities such as crawling games, parent-child interactive exercises, and walking exercises, while children aged 3-6 years old add aerobic exercise items such as rope skipping, jumping in place, fun jogging, and shooting balls. Nursing staff demonstrated standard exercise movements on site, corrected incorrect exertion postures, and informed family members that 5-8 minutes of warm-up activities were required before exercise, and 5 minutes of stretching and relaxation were performed after exercise to prevent muscle strains and joint injuries. The nursing staff stipulates that the child should have a cumulative effective activity time of no less than 60 minutes per day and complete the exercise 5 to 6 days a week. Family members will accompany the child throughout the exercise process. During the exercise, the child's face, sweating and subjective feelings will be observed. Once dizziness, panic, or excessive fatigue occur, the activity will be stopped immediately. Nursing staff asked family members to control the children's daily sedentary time. Children under 2 years old should avoid contact with electronic screens. Children 2 years old and above should not watch TV or use electronic devices for more than 15 minutes at a time. Short-term activities such as getting up, walking around, and stretching the limbs should be arranged between long periods of sitting. Nursing staff issue exercise record cards, and family members fill in the daily exercise items and actual exercise duration. The record cards are handed in during follow-up visits. Nursing staff check the exercise completion status. For families whose exercise frequency is insufficient and the duration is not up to standard, they clearly inform families of the adjustments that need to be made. For children whose physical fitness has improved, the exercise intensity is appropriately adjusted.

2.3. Observation indicators

(1) Compare the body fat indicators of the two groups of children before and after the intervention. The body fat rate is mainly measured using a professional body fat analyzer. The higher the value, the more serious the body fat accumulation is.

(2) Compare the growth indicators of the two groups of children before and after intervention, including weight and body mass index (BMI). The higher the BMI value, the more serious the obesity in children.

2.4. Statistical methods

Data were analyzed using SPSS22.0. Measurement data are presented as mean plus or minus standard deviation, and a t-test is performed. $P < 0.05$ means the difference is statistically significant.

3. Results

3.1. Comparison of body fat percentages between the two groups of children before and after intervention

After intervention, the body fat rate of the observation group was lower than that of the control group ($P < 0.05$). See **Table 1** for details.

Table 1. Comparison of body fat percentage of the two groups of children before and after intervention (mean ± SD,%)

Group	n	Body fat percentage before intervention (%)	Body fat rate after intervention (%)
Control group	34	28.41 ± 2.91	26.95 ± 2.64
Observation group	34	28.36 ± 2.87	24.18 ± 2.46
t value	-	0.071	4.476
P value	-	0.943	<0.001

3.2. Comparison of growth indicators between the two groups of children before and after intervention

After intervention, the weight and BMI indexes of the observation group were lower than those of the control group ($P < 0.05$) (**Table 2**).

Table 2. Comparison of growth indicators between the two groups of children before and after intervention (mean ± SD)

Group	n	Weight before intervention (kg)	Body weight after intervention (kg)	Pre-intervention BMI (kg/m^2)	Post-intervention BMI (kg/m^2)
Control group	34	22.68 ± 2.55	22.48 ± 2.51	19.46 ± 1.42	19.28 ± 1.38
Observation group	34	22.65 ± 2.52	21.15 ± 2.36	19.43 ± 1.40	17.98 ± 1.25
t value	-	0.049	2.251	0.088	4.071
P value	-	0.961	0.028	0.930	<0.001

4. Discussion

Childhood obesity is a very common chronic nutritional and metabolic abnormality during the growth and development stage of children. The emergence of this disease is the result of multiple factors such as dietary structure, exercise habits, and lifestyle. Children are in a critical stage of rapid physical development, and the body's metabolic function has strong plasticity. Early implementation of scientific and effective intervention methods can correct obesity and reverse the continued accumulation of body fat, thereby ensuring the normal growth and development process of children [4]. Scientific dietary care operations and exercise care operations are intervention methods designed to target the core triggers of childhood obesity. The two types of operations work

together to build a two-way intervention system that controls dietary intake and increases exercise consumption, which is more in line with the metabolic characteristics and actual growth and development needs of obese children. This is also the core basis for this joint intervention model to achieve better results.

From the data obtained in this study, it can be seen that the body fat rate of the two groups of children was in a similar state before the intervention. After the intervention, the body fat rate of the children in the observation group dropped to a greater extent. This result is closely related to the mechanism of the entire set of dietary care operations. The fundamental reason for the continuous accumulation of fat inside the body is that the total caloric intake exceeds the total caloric expenditure for a long time. The excess calories will be converted into adipose tissue and accumulated inside the body, thus causing the body fat rate to increase [5]. The dietary care operations carried out by the observation group do not stop at oral health information. The nursing staff collects the children's real dietary baseline data and then determines an individualized calorie distribution plan, coupled with physical portion demonstrations and quantitative guidance on the use of kitchen utensils. This can help families transform abstract dietary requirements into concrete operations that can be implemented at home, and reduce practical problems such as inadequate calorie control caused by family members' inaccurate grasp of food portions. Dietary care operations not only limit total calories, but also take into account the supply of various nutrients needed for children's growth. They will not use a complete diet to control weight, so as to avoid insufficient nutritional supply from interfering with the development of children's bones and organs. The use of diet registration forms and regular follow-up check-ups can continuously detect various deviations in the implementation of home diets and make timely corrections to excessive eating and unreasonable food choices. With long-term persistence, children can gradually change bad eating behaviors such as overeating, eating extra meals and snacks, and reduce the continuous entry of exogenous calories into the body. A reasonable dietary pattern can also regulate the body's basal metabolic state. A stable supply of nutrients can maintain the normal activity of enzymes related to lipid metabolism, maintain the body's ability to break down fat, reduce the continued synthesis and accumulation of fat, and ultimately contribute to a significant decrease in body fat rate [6].

The results of the study show that after the intervention, the improvement in weight and BMI indicators of children in the intervention group was better than that in the control group. Such changes in data can reflect that the addition of exercise care operations can further amplify the improvement in growth indicators of obese children. Abnormal increases in weight and BMI values can intuitively reflect the actual severity of childhood obesity. Simply relying on dietary control can only reduce the source of calories, but has a limited effect on consuming adipose tissue that has been accumulated in the body. Regular exercise intervention can make up for this shortcoming [7]. The sports nursing operations of the observation group will refer to the children's age and physical fitness baseline to select suitable sports items. The nursing staff will complete action demonstrations and correct wrong postures on site, and cooperate with warm-up and stretching operation guidance, which can reduce the possibility of muscle and joint injuries when children perform sports and adapt to children's undeveloped movement systems. During regular aerobic exercise, the body can mobilize stored fat to participate in energy supply, accelerate the decomposition and consumption of subcutaneous fat and visceral fat, and directly drive the weight level back down. Exercise nursing operations also control children's static and sedentary behavior, shorten the use time of electronic devices, and increase opportunities for fragmented activities, which can reduce the problem of low daily total calorie consumption. The entire process of exercise record cards and follow-up examinations can supervise family members' implementation of exercise-related requirements and avoid the problem of formality in exercise plans in the family environment. In addition to directly consuming fat, long-term regular exercise can also improve children's endocrine and lipid metabolism levels, increase the body's muscle proportion, optimize body

composition, prevent calories from being converted back into fat, and gradually reduce body weight and BMI to the normal range, making up for the limited improvement of a single dietary intervention [8].

5. Conclusion

In summary, the intervention method of scientific dietary guidance combined with exercise guidance can effectively improve the body fat accumulation problem of obese children, optimize children's weight and BMI and other growth indicators, the intervention effect is stable and safe, meets the intervention needs of children's growth and development, and has high clinical application value.

About the author

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Disclosure statement

The author declares no conflict of interest.

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