

RESULTS OF A NON-PHARMACOLOGICAL TRIAL FOR WEIGHT LOSS OF OBESE CHILDREN-PARENTS PAIRS

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Abstract

BACKGROUND: Family-based interventions are the most well-established way for the treatment of childhood obesity. For being applicable and sustainable; these interventions should be assessed in different community settings. The aim of this study was to compare the effects of two methods of nutritional intervention on weight loss of obese children-parents pairs.

METHODS: This 12-week non-pharmacologic trial. With one year of follow up was conducted among 120 participants (60 pairs of obese children-parents). They were randomly assigned into two groups of equal number: one group received a diet with an energy content based on the calorie requirement for height, and the other group received dietary counseling about healthy nutrition for weight loss.

RESULTS: Comparison of baseline characteristics vs. one-year follow up, showed that the mean value of body mass index decreased significantly in children, but not in their parents. In addition both groups of children had favorable changes in the mean consumption frequency of the studied food groups. The difference was not significantly different between the children in these two groups.

CONCLUSION: This study showed that dietary counseling, consisting of simple and applicable improvement in dietary habits can be integrated to the usual diet of the family, and will result in sustainable changes. Furthermore, it confirmed the efficacy and sustainability of dietary counseling for weight control of obese children but not their parents; and emphasized on the importance of healthy lifestyle establishment, from early life rather than trying to change it during adulthood.

Keywords: Children, Parents, Obesity, Weight loss, Dietary habits.

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Introduction

Childhood obesity is emerging as a major public health problem worldwide¹, and its rapid rise, is of great concern for different health sectors.² Preventive measures should be undertaken as early as possible.³ Both clinical and public health approaches should be considered in this regard.⁴

Healthy lifestyle especially, healthy dietary habits need, to be developed as the core part of an obesity prevention program for young children.¹ The lack of effective and sustainable programs for prevention and control of childhood obesity mandates, finding easy and applicable programs^{4;5}, to prevent

early and late consequences of this health problem.^{6;7}

Families have an essential role in this regard, and health care providers need to give necessary information to parents and children.⁸ The home environment is certainly, the most important setting for shaping children's eating and physical activity behaviors. Family-based interventions targeting parents and children are known as the most well-established program for prevention and control of childhood obesity.^{9;10}

Social and family support, are motivating factors for healthy eating and physical activity.^{11;12} A good example comes from the preliminary findings of

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the Fit Kids/Fit Families (FKFF) program that resulted to overall healthier lifestyle behaviors, and reductions in the body mass index.¹³ However because of limitations of families to attend special classes, there is a growing demand for pediatric weight management programs that can be administered at home.¹⁴ Weight loss programs for mothers have been successful in their children's lifestyle change¹⁵, and confirmed the direct correlation of factors associated with obesity among children and parents.^{16;17} However, almost all such interventions have been conducted in Western countries, obviously because of variations in cultural and socio-demographic backgrounds in different population-sand for being applicable and sustainable, these family-based interventions should be assessed in different community settings.

The aim of this study was to compare the effects of two methods of nutritional intervention on weight loss of obese children and parents pairs.

Materials and Methods

This non-pharmacologic clinical trial was conducted from 2003 to 2006 in Childhood Obesity Research Clinic of Pediatric Preventive Cardiology Department; Isfahan Cardiovascular Research Center (ICRC) affiliated to Isfahan University of Medical Sciences, located in Isfahan, Iran. Study participants were 120 obese individuals consisting of 60 pairs of obese children, aged 6-18 years, and their obese parents.

The study was approved by the Ethics Committee of ICRC (NIH Code: FWA 0000t8578). Verbal assent was obtained from children and adolescents and informed written consent from their parents.

Participants were selected consecutively from those children referred to the aforementioned clinic. Children and adolescents aged 6-18 years and with obese mother or father were eligible for the trial. Those individuals with mental retardation, chronic medical problems and/or drug use, abnormal face or other signs compatible with genetic syndromes were not included in the trial.

The calculated age from birth till the interview date was recorded. Weight (Wt) and height (Ht) were measured by calibrated scale and stadiometer (Seca, Japan) with subjects lightly clothed and bare-foot to the nearest 0.1 cm and 0.1 kg, respectively. Body mass index (BMI) was calculated as Wt (kg) divided by Ht (m) squared. Waist circumference (WC) was measured with non-elastic tape at a point midway between the lower border of the rib cage

and the iliac crest at the end of normal expiration. Hip circumference (HiC) was measured by the same tape at the widest part of the hip at the level of the greater trochanter to the nearest 0.5 cm. Waist-to-hip ratio (WHR) was calculated by dividing WC to HiC. All measurements were made by the same trained general practitioners and nurses under the supervision of the same pediatrician.

Participants filled in a 64-item semi-quantitative food frequency questionnaire (FFQ). By considering the dietary recommendations provided to both groups of participants, the following six food groups were included in the analysis: high fat meat, grains, vegetables, nuts, sweets, fast foods / restaurant foods and salty/fat snacks.

Then, eligible children and parents were randomly assigned to two equal groups: one group received a diet with an energy content based on the calorie requirement for height, and the other group received dietary counseling about healthy nutrition for weight loss. This trial was continued for 12 weeks.

Physical examinations that were conducted at enrollment, were repeated after sixth and twelfth weeks, as well as at 9 and 12 months after baseline.

Within group and between group changes, from baseline to the one-year follow up study were compared. SPSS for Windows (version 15.0 (SPSS Inc., Chicago, IL) was used for data analysis. The normality of the distribution of variables with a Kolmogorov-Smirnov test was verified and found no significant deviation from normality. Results are presented as mean \pm standard deviation (SD). T Student and X² tests were used to determine the significance of differences. The significance level was set at P<0.05.

Results

All participants completed the trial and the follow up studies. Mean (SD) of anthropometric measurements of participants at baseline and 1 year after the trial are presented in Table 1. It shows that the mean value of BMI decreased significantly in children, but not in their parents. As presented in Table 2, both groups of studied children had favorable changes in BMI and the mean consumption frequency of the studied food groups; this difference was not significantly different between the two groups. No significant change was documented among parents in the two groups (Table 3).

Table 1: Changes in anthropometric measures in all participants.

Characteristics	Groups	
	Children (n =60) Baseline vs. one-year-follow up	Parents (n =60) Baseline vs. one-year-follow up
Weight (kg)	46.21±13.8 47.97±14.1 **	77.67±14.5 76.61±14.6
Height (cm)	139.90±11.51 45.22±12.5 **	157.93±6.8 157.92±6.8
BMI (Kg/m ²)	23.06±3.7 22.54±3.6 **	31.01±4.45 30.58±4.6
Waist circumference (cm)	76.47±10.3 78.83±10.9	94.87±10.1 94.35±10.6
Hip circumference (cm)	86.11±9.8 87.75±10.8	106.32±9.5 106.62±9.7
Waist- to-hip ratio	0.89±0.1 0.90±0.1	0.89±0.1 0.89±0.1

** p<0.01

Table 2: Changes in mean (SD) of anthropometric measures and consumption frequency of some food groups in the two groups of children under study.

Characteristics	Diet recommendation (n=30)	Dietary counseling (n=30)
	Baseline vs. one-year-follow up	Baseline vs. one-year-follow up
Weight (kg)	47.53±15.3 48.75±14.3*	44.89±12.2 47.18±14.1**
Height (cm)	141.47±12.6 145.22±12.5**	138.33±10.3 143.22±12 **
BMI (Kg/m ²)	23.11±3.9 22.62±3.6	23.01±3.5 22.47±3.6*
Waist circumference (cm)	77.07±10.1 78.63±9.3*	75.87±10.6 79.03±12.4**
Hip circumference (cm)	86.30±10.5 87.67±10.1*	85.91±9.3 87.83±11.7*
Waist to Hip Ratio	0.89±0.1 0.90±0.1	0.88±0.1 0.89±0.1
High fat meat (times/wk)	2.50±3.1 1.80±2.7	2.77±2.8 2.10±2.5
Grains (times/wk)	9±2.9 8.67±2.4	9.28±3.2 9.1±3.4
Vegetables (times/wk)	5±3 4.82±2.8	6.1±3.2 6.2±2.6
Nuts (times/wk)	3.68±3.5 2.63±1.4 *	3.55±2.8 3.37±2.9
Sweets (times/wk)	10.17±4.6 8.98±3.6	9.75±4.7 8.80±4.8
Fast foods (times/wk)	2.02±2.6 1.42±0.7	2.35±2.4 1.30±1.05
Salty/fat snacks (times/wk)	2.39±1.6 1.20±0.9	1.43±0.2 1.10±0.2

* p<0.05 for within group changes

Table 3: Changes in mean (SD) of anthropometric measures and consumption frequency of some food groups in the two groups of parents under study.

Characteristic	Diet recommendation	Dietary counseling
	(n=30)	(n=30)
	Baseline vs. one-year-follow up	Baseline vs. one-year-follow up
Weight (kg)	76.48±13.2	78.87±15.8
	75.35±13.6	77.87±15.6
Height (cm)	157.55±7.9	158.32±5.5
	157.53±7.9	158.32±5.5
BMI (Kg/m ²)	30.66±3.3	31.35±5.4
	30.19±3.5	30.97±5.5
Waist circumference (cm)	95.30±7.9	94.43±12.1
	94.20±10	94.50±11.4
Hip circumference (cm)	103.27±5.2	109.37±11.7
	103.53±6.9	109.70±11.1
Waist to Hip Ratio	0.92±0.1	0.86±0.1
	0.91±0.1	0.86±0.1
High fat meat (times/wk)	3.21±3.5	3.43±3.1
	2.69±3.4	2.68±1.9
Grains (times/wk)	8.76±3	8.82±3.4
	7.79±2.9	8.92±3.4
Vegetables (times/wk)	5.30±3.3	7.12±3.4
	5.31±3.4	7.97±3.1
Nuts (times/wk)	2.31±2.4	4.40±3.7
	2.79±3	3.42±1.3 *
Sweets (times/wk)	8.50±3.6	6.77±3.5
	8.15±4	6.63±3.6
Fast foods (times/wk)	1.41±2.1	1.52±1.9
	1.09±1.9	1.14±0.6
Salty/fat snacks (times/wk)	0.63±1.2	0.37±0.2
	0.91±1.3	0.43±0.2

* p<0.05

Discussion

This study had two major findings that can be considered in future weight loss programs: first is that weight loss programs have more sustainable benefits for children than for adults, and the second is that giving simple recommendations for healthy nutrition to children are as effective as detailed diets recommended to them.

It is well documented that habit formation from childhood has various long term and short term impacts on weight control, as well as on other risk factors for chronic diseases, thus following simple recommendations about healthy nutrition can become as an integrated part of the lifetime habits.

Results of weight loss programs for parent-child pairs are controversial. A study on the effects of weight loss program for mothers and their 1-3 year-old children showed offering weight loss classes

was a successful and attractive method for low-income women to participate in an educational intervention that could also be useful for their children.¹⁵ Another study found that overweight parents with children whose BMI was on 85th-94th percentile were more likely to report receiving too little advice on nutrition and physical activity.¹⁸ A community-based obesity intervention program consisting of 11 weekly parent and toddler physical activity sessions, followed by a parent healthy lifestyle workshop, revealed that the compliance of families was unsatisfactory due to poor parental perception of child weight status, commitment issues, and limited staff capacity for outreach work.⁴

A pilot study of the success at home program indicated that children made significant improvements in a number of health-related areas (weight, body-mass index, body circumference measures,

flexibility) after nine months of using the program. Overall, parents were highly satisfied with the program and saw significant improvements in the physical health and psychological well-being of their children.¹⁴

The Fit Kids/Fit Families (FKFF) program that was a 12-week program consisting of weekly nutrition, activity and behavioral education, resulted in decreased total body circumferences and BMI reductions among children.¹³

It has shown that maintenance-targeted treatment improves short-term efficacy of weight loss programs for children.¹⁹ Furthermore, by considering that childhood obesity is a complex and multifactorial disorder, and is associated with various childhood parental characteristics and the effects are found to be partly mediated by a particular ineffective parenting style, namely inconsistent discipline on the part of the mother, it is recommended that weight loss programs for children should focus more on parenting behaviors and parental characteristics.²⁰ Usually families follow the detailed recommended diets including portion size and special foods for a short period of time; this is of special concern for families with the aforementioned characteristics that had led to the obesity of their children. Our study showed that dietary counseling consisting of simple and applicable improvement in dietary habits can be integrated to the usual diet of the family, and will result in sustainable changes. These findings should be confirmed by longitudinal studies.

Our findings confirmed the efficacy and sustainability of dietary counseling for obese children's weight control, and emphasizes on the importance of establishment of healthy lifestyle from early life rather than trying to change it during adulthood.

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