

Targeting Parents Exclusively in the Treatment of Childhood Obesity: Long-Term Results

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Abstract

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Objective: To report the long-term change in children's overweight following a family-based health-centered approach where only parents were targeted compared with a control intervention where only children were targeted.

Research Methods and Procedures: Fifty of the 60 children who participated in the original study were located 7 years later, and their weight and height were measured. At the point of the 7-year follow-up, the children were 14 to 19 years of age. Repeated measure ANOVA was used to test differences between the groups in percent overweight at different time-points.

Results: Mean reduction in percent overweight was greater at all follow-up points in children of the parent-only group compared with those in the children-only group ($p < 0.05$). Seven years after the program terminated, mean reduction in children's overweight was 29% in the parent-only group vs. 20.2% in the children-only group ($p < 0.05$).

Discussion: Over the long term, treatment of childhood obesity with the parents as the exclusive agents of change was superior to the conventional approach.

Key words: childhood obesity, family-based treatment, targeting parents

Introduction

The prevalence of obesity in children and adolescents is increasing rapidly (1). The treatment of obesity is one of the

most difficult challenges that multidisciplinary pediatric health care providers face. Coping with obesity requires lifelong attention to healthy eating and an active lifestyle. It is necessary to alter the home environment rather than be preoccupied with the child's weight, because such a preoccupation may damage the child's self-esteem as well as the relationship between the parent and the child (2).

The home environment has the potential to affect children's energy balance and diet composition in numerous ways. Parents may influence the family environment by exposing family members to certain foods, by actively encouraging the family members to eat certain foods, or by passively allowing certain foods in the regular diets. Food-related parenting practices and the physical and emotional environment in which eating and activity behaviors are developed are also important variables (3–5). Parents may also serve as role models for their children's eating and activity behavior, although various studies have shown low family resemblance in food preference (6).

In nearly all prevention and targeted intervention work with young children (regardless of the specific health outcome being addressed), two-generation programs are considered essential for improving the child's outcome (7). In the treatment of childhood obesity, clear benefits have been demonstrated from parental involvement (8–11). State-of-the-art childhood obesity programs are based on family. Family-based intervention is implemented on the premise that parental support, family functioning, and home environment are important determinants of treatment outcomes. These interventions emphasize the necessity of making changes in the home and family environment (12,13).

Epstein et al. (13) provided evidence that treatments designed to target and reinforce a change in habits and weight loss in obese parents and children together are superior over 10 years to treatments that focus on the child's habits and weight change independent of parental success, as well as to a control treatment that targets and reinforces the family members for attendance only. Epstein et al. concluded from the 10-year outcome data that weight regulation in children can be achieved and maintained over

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extended periods from childhood through adolescence to adulthood. They suggested that parent modeling of children's eating and exercise behaviors was not a mechanism that could account for the outcome because children maintained a decreased percent overweight, whereas their obese parents were regaining weight.

It is likely that parental behavior is important during the acquisition of the skills, whereas changes in the environment (stimulus variables) and reinforcement for new eating and exercise behaviors may be operative over extended follow-up periods (13).

While it is apparent that parents should be involved in treatment of obese children, there is no consensus on the "how." It has been suggested that strategies that emphasize parental control over the quality and pattern of the food environment should be encouraged, whereas strict parental control over a child's food intake should be discouraged (14–16). Authoritative parenting (in which parents are both firm and supportive and assume a leadership role in the environmental change with appropriate granting of child's autonomy) rather than authoritarian style (which controls child-feeding practices) was found to be the effective parental child-feeding modality (4,16,17).

The Expert Committee for Obesity Evaluation and Treatment recommended that treatment of childhood obesity begin early and involve the family. Parenting skills were mentioned as the foundation for successful intervention that includes gradual targeted increases in activity and a targeted reduction in high-fat, high-calorie foods (2).

In most family-based behavioral weight loss programs for children, the obese child is the main agent of change, with varying degrees of parental involvement. We suggested previously that, if parenting style is the focus of treatment, the parents are the main agent of change, and they, rather than the child, should be targeted by the intervention. Exclusively targeting the parents in the interventions that had a family health-centered approach led to weight loss in obese children (12). Parents served as both a source of authority and a role model for their children. Parents provided an environment with fewer "obesogenic" factors and more self-regulation and healthy behavior practice. A program that omitted the obese child from direct intervention and targeted parents only was associated with greater weight loss and higher consumption of healthy foods compared with a program that treated children with the child-only condition, where they were the main agents of change (18).

The purpose of this paper is to report the long-term outcome in overweight children following a family-based health-centered approach where only parents participated in the group sessions (parent-only group) compared with a person-based intervention where only the children participated in the group sessions and the family environment was not directly targeted (children-only group).

Research Methods and Procedures

Subjects

Fifty of the 60 children who were initially randomly recruited for this study were located after 7 years. There were five participants missing in each group. At the point of the 7-year follow-up, the children were 14 to 19 years of age (mean age, 16 ± 0.5 years).

Initial Study Protocol

The Ethics Committee for Human Experimentation of Tel Aviv University approved the research protocol, and all parents provided written informed consent.

The children were randomly assigned to either the parent-only group (only parents were targeted) or the child-only group (children were targeted). The two groups were matched for sex and age. No significant differences in socioeconomic status were found between the groups.

Parent-only Group. Only parents participated in the group sessions, and all suggested changes were intended for the entire family. Parents attended 14 1-hour support and educational group sessions. The first four sessions were held weekly, the next four were held biweekly, and the last six were held once every six weeks. Clinical dietitians delivered the sessions. Two similar groups were held, with 15 families in each group. The topics discussed included limits of responsibilities, nutrition education, eating and activity behavior modification, decreasing stimulus exposure, parental modeling, problem solving, cognitive restructuring, and coping with resistance. Parents were encouraged to practice authoritative parenting style (11). A detailed description is given elsewhere (12,18).

Child-only Group. Each child was prescribed a diet providing 1500 kcal/d. Thirty 1-hour group sessions were led by a clinical dietitian. Two similar groups were held, with 15 children allocated to each group. The first seven sessions were conducted weekly, and the remainder were held biweekly for a total of 1 year. The topics discussed included physical activity, eating behavior modification, stimulus control, self-monitoring, nutrition education, problem solving, and cognitive restructuring. Individual counseling sessions were held whenever a child missed the group session, encountered difficulties in adhering to change, or asked for a change in his or her diet prescription.

Data Collection at Follow-up

Weight and height were measured 1, 2, and 7 years after the program's termination. Measurements were to the nearest 0.1 kg and 1 cm, respectively, using a standard medical balance-beam scale with a rigid vertical height rod (Shekel Scales, Tel Aviv, Israel). Subjects were weighed while wearing light clothing and no shoes. Percent overweight was calculated by the following formula: $100 \times (\text{actual weight} - \text{desirable weight})/\text{desirable weight}$. Desirable weight of the children was based on the 50th percentile

weight for a particular age, sex, and height according to the National Center for Health Statistics growth charts (U.S.) (1). Weight loss was determined by deducting the final percent overweight from the percentage overweight at baseline. Eat-26 (Eating Attitudes Test) was used to screen for individuals with significant symptoms of eating disorders at the 7-year follow-up visit.

Data Analysis

Statistical analyses were performed using SPSS 10 for Windows (SPSS Inc., Chicago, IL); p values of <0.05 were considered statistically significant. All results are given as mean \pm SD.

To compare the children's overweight status at the different time-points, a repeated measure ANOVA was used, with group and gender as the between variables and time as the within variable and linear contrasts used to follow-up on significant main effects or interactions. This is an intention-to-treat analysis where the missing values at the last follow-up meeting were replaced with baseline percent overweight values. The missing in-between values were replaced by values that were extrapolated from each child's overweight curve.

χ^2 analyses were used to compare the groups in percent of youth who achieved a nonobese status ($<20\%$ overweight).

Results

Weight Loss at Intervention Termination

The change in percent overweight during the intervention was published earlier (12). The children in the parent-only group achieved a significantly higher reduction in percent overweight compared with the children in the child-only group (14.6% vs. 8.43%; $p < 0.03$, analysis of covariance). This difference in weight reduction was observed even though there was no significant difference in increased height between the two groups over the 1-year study.

At the end of the intervention, 35% of the children in the parents-only group reached a nonobese status, whereas in the child-only group, only 14% reached nonobese status. χ^2 analyses revealed a significant difference between the two groups in the rate of the nonobese children at the end of the intervention ($p < 0.01$).

The change in overweight status did not show a statistically significant interaction with gender ($p = 0.23$) (12).

Follow-up Visits

At the 1-year follow-up visit (1 year after program termination), the weight loss in the children of the parent-only group was statistically significant compared with that of the child-only group (-13.6 vs. 0 , $p < 0.05$; Figure 1).

At the 2-year follow-up, there was a mean reduction in overweight of 15% in children of the parent-only group and an increase of 2.9% in children in the child-only group ($p < 0.01$; Figure 1).

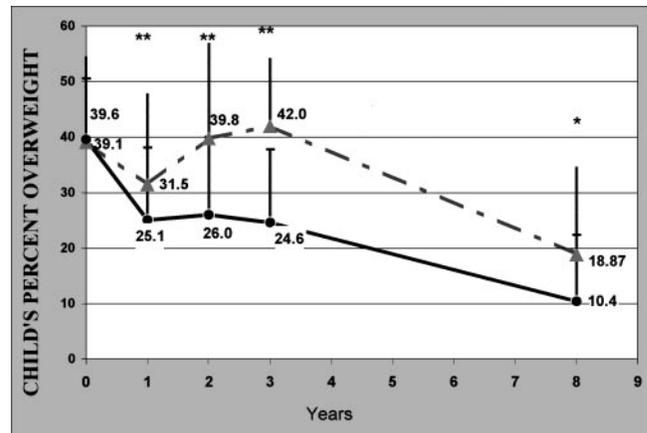


Figure 1: Change in children's percentage overweight at 1, 2, and 7 years of follow-up. Mean \pm SD. Significant difference between the parent only group (—) and the child only group (---): * $p < 0.05$; ** $p < 0.01$.

At the 7-year follow-up (7 years after program termination), to our surprise, both treatment conditions demonstrated substantial weight loss. However, the mean reduction in overweight was 29% in children in the parent-only group and 20.2% in those of the child-only group ($p < 0.05$; Figure 1). At this point, 60% of the children in the parent-only group compared with only 31% of the children in the child-only group were in a nonobese status. χ^2 analysis revealed a significant difference between the two groups in the rate of the children's nonobese status 7 years after the intervention terminated ($p < 0.01$). In the repeated measure analysis, significant differences were found between the two treatment groups ($F = 64.5$, $p < 0.000$). The effects of time and gender were both significant in the model (time $F = 14.4$, $p < 0.000$; gender $F = 7.9$, $p < 0.007$). In both groups, boys' overweight was greater than the girls', and this trend continued all along. A significant interaction was found for time by group ($F = 6.9$, $p < 0.000$), suggesting that the differences between groups in overweight reduction at each time-point were significant ($p < 0.000$). Time by gender and group by gender did not show a significant interaction, suggesting that rate of overweight reduction and treatment effect did not differ between boys and girls. No interaction was found between percent overweight at baseline and weight loss.

Seven years after the program terminated, two (6.6%) of the girls from the child-only group reported eating disorder symptoms. (Both were bingeing and purging.) None of the children from the parent-only group reported any eating disorder symptoms.

Discussion

A family-based, health-centered approach that targeted solely parents was found to induce greater weight loss in

obese children at treatment termination and at 1-, 2-, and 7-year follow-up visits. The differences between the groups were statistically and clinically significant at each time-point. A similar pattern of weight status over years was reported by Epstein et al. (13).

Family eating environments and child-feeding practices may constitute an “obesogenic” environmental influence for children. Improving food choice and reducing caloric intake in obese children are required for a long-term change. The higher percentage of weight reduction and better maintenance of reduced weight observed in children of the parent-only group compared with the children who actively participated in the sessions might be explained by the greater change in the “obesogenic” factors in the child’s environment. At the 12-month follow-up, greater reduction in the child’s problematic eating behaviors and in the presence of stimuli at home (sweets and snacks) was observed in the parent-only group (18).

A possible mechanism for the change in the obesogenic environment, although not measured in this study, could be the change in parenting practice. Practicing authoritative rather than controlling parenthood might contribute to parents’ ability to maintain a healthier environment. One of the main objectives of the parent-only group was to enhance authoritative parenting style to improve parents’ ability to create a healthy environment in the house and support their child’s autonomy and self-esteem. Although the change in parenting style was not tested in this study, other studies have reported that fruit consumption and fruit-specific cognitions were most favorable among adolescents who were being raised with an authoritative parenting style (4). Fisher et al. reported that parental pressure to eat fruit and vegetables discouraged intake among young girls (19).

Parents who are concerned about their children’s food intake behavior may adopt controlling child-feeding practices in an attempt to prevent overweight or negative health consequences (15). Mothers reported using more restrictive feeding practices when they were invested in weight and eating issues, when they were concerned about daughters’ weight, and when daughters were heavier. Mothers reported using more pressure in child feeding when daughters were thinner and when they perceived daughters as underweight (20).

Constructive functioning of parental authority instead of parental controlling is crucial for preventing and treating childhood obesity, because parental strategies for controlling their child’s food intake are counterproductive to the development of the child’s self-regulation ability (14–17,21,22). Parental control efforts may increase children’s preference for restricted foods as well as their intake of such foods (15,20–22) while diminishing self-control in eating (14).

In our study, parents served both as a source of authority and as role models for the obese child. They controlled the

quality and pattern of the food environment (offering a variety of healthful foods, less food stimulus at home, overseeing the planning and assembly of meals) as well as limited sedentary behaviors. Nevertheless, parents were advised not to restrict the amount of food the child ate during meals, thus promoting more self-regulation that fosters healthy practices related to weight control issues (11).

Approaching parents exclusively shifts the focus of the group from weight issues to parenting issues, which is decisive in light of current evidence suggesting that the family is becoming a more democratic unit and that children are spending more on sweet snack items than ever before (23).

Prospective studies of adolescent girls suggest that dietary restriction predates bulimic symptoms (24), with one study reporting that adolescent girls who were dieting had an 8-fold increased risk for being diagnosed with an eating disorder compared with nondieters (25). In our study at the 7-year follow-up, 6.6% of the subjects in the children-only group developed eating disorder symptoms (close to the 9% rate of eating disorders in the general population seen in studies that used self-reported diagnoses). Epstein et al. found that at the 10-year follow-up, 4% of the subjects (all girls) reported having been treated for eating disorders (26).

Targeting parents for parenting skills in the treatment of childhood obesity is supported by wide research (27–29). Glenny et al. found that at 1-year follow-up, children whose parents had participated in a short course in general behavior management had significantly better weight control than children in an intervention program that focused only on weight reduction (28).

Although not measured, the dietitian noted a lower level of resistance to change among the children in the parent-only group compared with those in the child-only group where the children had to be actively responsible for the necessary change. Lerner (30) suggested that children often resist change and express it by rebellion and acting oppositely when subjected to demands for change. Although the children were encouraged to seek their parents’ help if needed, success was still their responsibility. For a child whose family did not accept the necessary environmental changes, the child’s success was probably of short duration.

The long-term results were surprisingly positive, with 60% of the children in the treatment group vs. 31% in the control group in nonobese status. At the 7-year follow-up, some of the participants from both groups were soldiers in the army (with increased physical activity level at this period) and some were in their late adolescence, a period in which many obese individuals take responsibility for controlling their overweight. This might explain part of the reduction in overweight observed at this point in time.

This study does have some limitations. Sample size was modest; thus, to preserve adequate statistical power, only two conditions could be studied. We chose the child-only

approach as the control group, because this is the prevalent intervention treatment approach in Israel and in many other countries. Future research should compare the parent-only approach with the parent-child approach, both targeting a health-centered approach rather than weight loss. Studies should explore ways to enhance parent compliance and partnership in implementing the changes needed in the house, in accordance with the observation that some parents (mainly morbidly obese) were less cooperative, claiming that their personal freedom was threatened.

Parents should be the main change mediator in weight-related interventions, because their involvement is crucial for the induction of a healthy environment, modeling of healthy eating and activity patterns, and improvement in the child's practices and weight status in the long term. A health-centered rather than weight-centered approach may be the most appropriate intervention for the treatment and prevention of childhood obesity.

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