

# Changing Parental Style for the Management of Childhood Obesity: A Multi-Component Group Experience

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**Abstract:** Obesity is a complex public health issue with increasing prevalence in childhood and with a large burden on physical and mental health. Recent data suggest the effectiveness of multi-component approach, of interventions aimed at changing parenting style, and of group educational sessions. In particular, interventions containing a family-behavioral component produce larger effect sizes than alternative treatment groups. Many models have been developed for the multi-component and multi-stakeholder treatment of childhood obesity, with a frequent discrepancy in the intensity of the treatment programme and in the resources available within clinics. Looking for effective strategies for the treatment of childhood obesity we built a Multi-component Obesity Group Experience (MOGE) model, analysing BMI and fat mass reduction as primary outcomes and qualitative improvements in the behavior towards nutrition and lifestyle as secondary one. Thirty-five consecutive obese children (20 girls, BMI z-score  $2.1 \pm 0.2$ ), were treated by MOGE model and the results were compared with 35 matched obese subjects of the same age (control group followed with a traditional treatment). After 3, 6 and 12 months of treatment it has been observed a significant reduction of BMI z-score and body fat mass. Moreover, a clinically significant psychological wellness was observed in children of MOGE group.

**Keywords:** Obesity, weight management, multi-component-group-programme, parenting style, behavior.

## INTRODUCTION

Paediatric obesity, defined as  $\geq 95^{\text{th}}$  percentile of BMI for age and gender [1], is a major increasing public health concern. Obese children probably become overweight/obese adults, with a shorter life expectancy and a major risk of metabolic and cardiovascular complications [2]. Therefore, an urgent need to develop new therapeutic strategies is required [3].

Conservative approaches such as family-based and behavioral weight management are indicated as initial interventions and are crucial for long-term weight control [4].

The most recent literature shows that multi-component programmes are more effective than single component ones in treating childhood obesity [5-8]. Parents seem to be the first responsible for their children's nutrition and physical activity patterns [9]. Parenting interventions seem to have positive long-term effects on emotional and behavioral disorders and on successful developmental competence [10]. Moreover, results from a meta-analysis of family-behavioral weight-loss treatments indicate that interventions containing a family-behavioral component

produce larger effect sizes than alternative treatment groups [11].

Therefore the involvement of parents is a key stone for a successful treatment [12-14] and interventions should target education and behavioral change in parents, mutually reinforcing behavior within the family [15, 16].

Recent studies show that interventions aimed at changing parenting styles are effective in the prevention and management of childhood obesity [13-15]. In particular, parents, aware of their children weight problems, with low grade of stress and high level of motivation in changing food habits and lifestyle, positively influence child's weight by modelling healthy behavior, controlling food availability, offering physical activity opportunities and making appropriate feeding practices [15, 16].

The literature [10, 11, 17-20] shows many models for the multi-component and multi-stakeholders treatment of childhood obesity with a discrepancy in the following aspects: health professions involved, intensity, frequency of meetings, follow up, resources available within clinics (Table 1).

Our aim was to evaluate the efficacy of a Multi-component Obesity Group Experience (MOGE) in comparison to a traditional model of treating childhood obesity. In particular, we analysed the BMI and fat

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**Table 1: Multi-Component Programs for the Treatment of Childhood Obesity Involving Parents**

References	N. Subjects and Age	Control Group	Length of the Programme	Methods	Results
Robertson <i>et al.</i> (2008)	27 overweight or obese children and their families 7-13 years	Not present	3 months intervention + 9 months follow up	12-week programme with parallel group sessions for parents and children	↓ BMI ↑ quality of life, lifestyle, child-parent relationship ↑ parents' mental health
Kalarchian <i>et al.</i> (2009)	97 children 8-12 years	95 children 8-12 years	18 months	<u>First 6 months:</u> 20 parallel group sessions (60min) with obese children and their parents <u>6-12 months:</u> 3 group sessions + 3 telephone calls	↓ BMI in short term Longer term weight change benefits ↓ Blood pressure ↓ Body fat mass ↓ Waist circumference
West <i>et al.</i> (2010)	101 parent-child 4-11 years	49 children 4-11 years	12 weeks intervention + 12 months follow up	9 group sessions (90 min) + 3 telephone sessions (20 min)	↓ BMI ↑ parents' management of children's behavior
Pinard <i>et al.</i> (2012)	26 parent-child dyads 8-12 years	Not present	12 weeks	6 biweekly group sessions (90 min) + 6 automated telephone calls (10 min)	↓ BMI ↑ body lean mass ↑ quality of life
Teder <i>et al.</i> (2012)	26 obese children and their parents 8-12 years	Not present	24 months	25 parallel group sessions with obese children (2 h) and their parents (1.5h)	↓ BMI
Present study Iaccarino Idelson <i>et al.</i>	35 obese children and their families 8-13 years	35 children 8-13 years	12 months intervention and follow up	12 monthly group sessions (120 min) with both parents and children held by the multidisciplinary team	↓ BMI and BMI z-score ↑ self-esteem and self efficacy ↓ social suffering ↓ body fat mass

BMI: Body mass index.

mass reduction, qualitative improvements in the behavior towards nutrition and lifestyle and time spent for the treatments.

## METHODS

The multidisciplinary staff involved in MOGE include a paediatrician, a nutritionist and a clinical psychologist.

Thirty-five consecutive obese children (20 girls) were enrolled from February to April 2011 at our university pediatric outpatient clinic. They were in late childhood and/or pre-adolescence when subjects are able to follow multidisciplinary counselling but not too old to exclude parental involvement. Quantitative methods were used to determine the reach, implementation, and success of the intervention,

whereas qualitative research methods were used to determine feasibility and appreciation (i.e. post pilot questionnaires with open questions). The results were compared with a group of other 35 patients, enrolled from October to December 2010, which followed a standard therapeutic path in the same university pediatric outpatient clinic (i.e. individual ambulatory visits managed by a pediatrician and supported by a dietitian; four meetings in 12 months). The children belonging to the 2 groups were of the same age and had similar socio-economic status.

Inclusion criteria were: age range 8-13 years old, BMI percentile ( $\geq 95^{\circ}$ ), availability to participate to family group programmes, absence of chronic genetic/metabolic growth-involving syndromes and of medications that would alter appetite in either direction.

MOGE model included 2 individual meetings with a week distance and 12 group meetings of 2 hours. During the first meeting the children were individually assessed by the pediatrician, the clinical psychologist and the nutritionist, for a total time spent of 2 hours each patient. The paediatrician evaluation consisted in selecting patients affected by idiopathic obesity, excluding endocrine, genetic and/or iatrogenic obesity. The nutritionist collected the measures of weight and height and waist circumference for the calculation of BMI and of waist to height ratio (WHtR), analysed the body composition by bio-impedance analysis and assessed weight gain personal history, and nutritional habits of both the child and his/her family by a food frequency questionnaire. Moreover, a questionnaire including questions about the number of hours spent in programmed physical activity, and on screen time (PC, TV, videogames) was administered. The psychologist assessed, by clinical interviews according to psychodynamic assessment model [21], the areas of personality, defensive mechanisms, psychopathological areas, personal psychological resources, self-esteem and self-efficacy, body image, motivation and global psychological wellness.

At the end of the first meeting a food recording sheet was given to the families (composed by the child in treatment and at least one parent), with the instructions for compiling a food diary for 14 days. On the sheet all the meals were listed and adequate space was left between the meals names, with the aim of facilitating the recording and writing of each food they ingested. The diary was discussed 2 weeks later.

In the second meeting a questionnaire on the knowledge of the recommendations on healthy nutrition was administered to the children/adolescents, who were required to answer with their parents' help. Starting from the evaluation of their food diaries, nutritional/behavioral counseling and a dietetic general scheme were given in group (parents and children together). The general dietetic scheme was slightly hypocaloric (-20% of the estimated caloric need of the child) [13] and the parents were very encouraged to eat the same food, the same meal, at the same table with the child and the entire family.

Successively, two hours monthly group sessions, aimed at changing parenting style and family behavior, encouraging the acquisition of healthy nutritional habits and lifestyle, were held for 12 months. The meetings were conducted by the nutritionist and the psychologist. The total number of the meetings was 14 for each patient, corresponding to a total time of 28 hours.

The frame of the group was open, with a minimum of 8 children/adolescents and a maximum of 10. In total 32 children were accompanied exclusively by the mother, 2 children exclusively by the father and only one child by both parents (who were divorced).

Before each group meeting the collection of anthropometric measures was performed individually for each child/adolescent. Bottles of water, symbolizing the amount of grams lost from their body mass, were given to the children/adolescents in order to show to the group the weight lost. The meetings were organized as an open discussion from which crucial topics emerged. In particular, the psychologist acted as a group facilitator, focusing on specific topics including: 1) health style (breakfast, physical activity, soft drinks, holidays, snacks, automatic distribution, screen time, fruit/vegetables consumption, social parties); 2) psychological issues (body image, motivation, self-esteem, self-efficacy, teasing and discrimination, parent's cohesion, parent capacity of giving limits and family strategies).

The behavioral techniques applied in group were: *contracting* (defining a therapeutic contract with children and family), *goal setting* (defining goals to achieve gradually with children and their family), *self monitoring* (controlling food intake and physical activity by records), *parental modelling* (parents role as models about food intake and physical activity), *reinforcement* (activating a positive reinforcement system of correct behavior), *stimulus control* (controlling situations at risk like parties), and *problem-solving* (defining strategies to face obstacles). These techniques were specifically aimed at changing general parenting styles, specific parenting practices, children behaviour and family life style [6-22].

After 3, 6 and 12 months BMI was calculated and fat mass was measured by bio-impedance analysis.

The total time spent for each patient in both MOGE and in the control group was calculated.

The mean for all quantitative variables are presented alongside the standard deviation and range. The Student's *t* test for independent groups was used to compare experimental and control groups, while the repeated measures *t* test was used to compare the same subjects tested under different times of treatment, after checking for the normality of the distributions. All reported probability values (*p* values) were based on two-sided tests and compared to a

**Table 2: General Characteristics of the Sample and the Control Group at Baseline**

	MOGE (n.35)		Control (n.35)	
	Mean±SD	Range	Mean±SD	Range
Age (years)	10.9±1.6	8.0-13.9	11.0±1.4	8.4-13.6
BMI (kg/m <sup>2</sup> )	30.0±4.5	22.8-43.7	29.8±4.8	22.0-43.9
BMI z-score	2.1±0.2	1.8-2.4	2.1±0.3	1.9-2.6
WHtR	0.59±0.1	0.49-0.72	0.62±0.1	0.5-0.71

significant level of 5%. SPSS 19 software was used for all the calculations (SPSS Inc., Chicago, IL, USA).

## RESULTS

The general characteristics of the studied sample are shown in Table 2. Mean age was: 10.9 ±1.6 years old; the mean BMI was 30.0±4.5; the mean BMI z-score was 2.1±0.2; WHtR was <0.5 only in 1 case. No significant difference was reported among the baseline characteristics of the MOGE model group and those of the control group.

After 3, 6 and 12 months of treatment it has been observed a significant reduction of BMI z-score and body fat mass in comparison with the control group (Table 3). Moreover, it was also observed a clinically significant psychological wellness and a reduction of suffering from social consequences like teasing and discrimination.

Calculating separately the sum of hours spent by the team for the treatment of childhood obesity in 12 months in MOGE model it was observed that the time devoted to each patient in the MOGE model (154

hours) was 26.7% less than that employed in the standard therapeutic path (210 hours).

## DISCUSSION AND CONCLUSIONS

This study presents an example of feasible model to treat childhood obesity by empowering strategies, and optimizing the time spent by the team in the clinical practice. It shows a good effectiveness both quantitatively (BMI z-score, BMI reduction and positive changes in body composition) and qualitatively (improvement of psychological wellness, raising of motivation to follow a healthier lifestyle, qualitative changes in nutritional habits and reduction of sedentariness).

An inner limit of the programme's structure is the difficulty in fathers' participation to all sessions. In particular, they claimed the difficulty to come every month to the clinic, making too many days of absence from work. Another limit is the small sample size, while the major strengths are the possibility of sharing both emotional difficulties and positive experiences among group members.

**Table 3: Comparison of Retention Rate and Weight Loss between Groups**

	MOGE (n 35)		Control (n 35)	
	Retention rate (%)	Weight loss (BMI; BMI z-score)	Retention rate (%)	Weight loss (BMI; BMI z-score)
T3 months	77.1	BMI: - 1.4 z-score: - 0.25 Fat mass reduction (%): - 5%	48.3	BMI: -2.7* z-score: - 0.30* Fat mass reduction (%): - 4.5%
T6 months	60.0	BMI: -4.6 z-score: -0.35 Fat mass reduction (%): - 7.3%	31.0	BMI: -3* z-score: - 0.36* Fat mass reduction (%): - 4.6%*
T12 months	48.3	BMI: - 4.6 z-score: -0.35 Fat mass reduction (%): - 8.0%	17.2	BMI: - 3.7* z-score: - 0.39* Fat mass reduction (%): - 4.9%*

\*= p<0.05 vs. T0.

The literature on the management of childhood obesity frequently shows a small sample size consequent to high drop-out rate and short follow up [13, 20-23]. This confirms that the treatment of obesity is very difficult, in particular in the recruitment phase and also in retention during a long time. MOGE model results are coherent with other studies [24-26]; nevertheless further research has to be implemented to assess the efficacy on a wider sample, with a longer time follow up and using also quantitative psychological questionnaires. Moreover, family-based-multi-component obesity treatment programmes are associated with moderate weight losses and health benefits for children, but few studies have focused on severely obese children. Models which utilize parents as key players for the treatment of childhood obesity should have a greater dissemination, with the idea that the changes have to be initiated and implemented by parents and spread out through the entire family.

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