Parents as agents of change in childhood obesity - from research to practice

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ORIGINAL ARTICLE

Parents as agents of change in childhood obesity – from research to practice

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Abstract

The home environment is undoubtedly the most important setting in relation to shaping children's eating and physical activity behaviors. Family-based behavioral treatment is the most well-established intervention for the treatment of childhood obesity. Historically, family based interventions target the obese child and at least one or both parents. Presented here is a review of the literature on parents as exclusive agents of change, with the addition of some recent results indicating the effectiveness of this approach when implemented in public health programs. Targeting parents as the exclusive mediator has resulted in a better reduction in children's percentage overweight, and improvement in the obesogenic environment and behaviors, in comparison to a setting in which parents attended sessions with the obese child, or only children attended sessions. The findings from these studies were subsequently implemented in a national community-based survey. Both children's and parents' weight status were significantly improved, although only parents attended the group sessions. A significant reduction in the obesogenic load at home was also found. Permissive parenting style was associated with less reduction in obesogenic load at home (p < 0.01) and with less weight loss (p < 0.05). Omitting the obese child from direct intervention and targeting parents only is a cost-effective approach with integrated messages for the management of weight-related problems.

Key words: Childhood obesity, family-based intervention, parents-only

Introduction

The global obesity epidemic is one of today's most pertinent public health issues. In recent years, the prevalence of obesity among children and adolescents has risen dramatically in many western countries and in countries undergoing economic transition, becoming a common issue in many homes (1,2). The magnitude of the health problems associated with increasing levels of obesity now means that obesity is not just a clinical issue. Obesity has become a social problem (3).

Environmental factors that encourage the consumption of greater food energy than is required and that encourage sedentary behavior, or discourage physical activity, affect how lifestyle intake patterns are established in early childhood and may ultimately influence the development of obesity (4–9). At the same time, the obesogenic environment idealizes thinness and stigmatizes fatness, but paradoxically encourages excess food intake and quick approaches to weight loss (4).

Children and adolescents may be exposed to conflicting messages from family members and from society regarding food and weight issues (10). According to the social-cognitive model, behavioral patterns are seen to be under the control of external reinforcement (e.g., operant conditioning, such as reward and punishment), classical conditioning, and cognitive mediational processes (11,12). Children's food intake is influenced by environmental factors, such as role modeling (learning through observation alone), frequency of food exposure, and portion sizes (13). Parenting practices and the emotional climate in the house also influence eating behaviors (14,15). The home environment is undoubtedly the most important setting relative to shaping children's eating and physical activity behaviors.
Prevention of obesity must start early in life. Dietz has identified infancy and adolescence as two of the three critical periods in the development of obesity (16). To reduce the epidemic of childhood obesity, environmental factors should be altered (17). Long-term weight management programs have, however, proven the above goals exceedingly difficult to achieve (18). The limited effectiveness of treatments for established obesity through interventions that treat the obese child with a weight-centered intervention (only 30% of the treated children reached a non-obese status after 10 years), makes the identification of targets for early intervention of potentially great public health importance, through a reduction in the obesogenic load in the child’s environment (19,20).

Today, state-of-the-art childhood obesity programs are family-based. There is a consensus that interventions to prevent and treat childhood obesity should involve the family, however, the extent of the child’s involvement has received little attention (19–22). Some studies indicate that when both parents and children are targeted for behavior change, outcomes usually improve (20); others have not reported on long-term improvement (23).

Historically, family-based interventions involve both the obese child and at least one parent. Behavioral interventions with parents and children use varying levels of parental involvement and include behavioral modification, behavioral therapy, and problem solving (24–28). Epstein et al. suggest that the role of parents should be expanded beyond the specific weight-loss partnership or support system, to include coping with the child’s frustration and the required permanence of behavioral changes and feelings that they are different from their peers because they are unable to eat as they do (29). Specific child interaction patterns could decrease parental effectiveness in achieving change in their children’s eating and exercise behaviors and consequently, in achieving net weight loss. Thus, parenting skill training is also an important component of family-based programs (30).

This paper reviews the literature on parents as exclusive agents of change with the addition of some recent results indicating the effectiveness of this approach when implemented in a public health setting. The paper comprises five sections. The first describes the theory behind approaching weight management with the parent as the main agent of change. The second describes the program objectives and its conceptual model. The third section presents the outcome of two randomized clinical interventions, comparing different parental roles. The fourth section presents the outcome of the suggested approach when implemented in public health care in an ongoing project, and the last section discusses the data and their limitations.

**Background to parental agent treatment**

In response to the substantial drop-out and relapse rates during treatment of childhood obesity, the difficulties often faced with respect to the small changes in relative weight or adiposity, and the increased prevalence of eating disorders (31), a novel family-based program was developed at the Hebrew University of Jerusalem which tackles the need for integrated messages addressing the broad spectrum of eating-related problems.

Beginning in 1994, our group took up the challenge of providing a comprehensive, interdisciplinary program for the management of childhood obesity with the parents as the main agents of change. In those days, the common treatment in Israel was individual weight-loss sessions with the children, and the parent (usually the mother) serving as a helper. In order to prevent the child’s resistance to change, to avoid the stigmatization, and the risk of pre-occupation with food and dieting, a family-based intervention targeting the caregivers only was planned. The premise of this model is to reduce the ‘toxic agents’ in the child’s environment and enhance parents’ authority with respect to the child’s environment, while also extending the child’s psychological space. With this model that uses parents as the sole agent of change, the prevention of disordered eating may be compatible with the prevention of obesity and the promotion of healthy eating and leisure time activities, as well as an increase in positive self-esteem and body image.

**Description of the program**

The objectives of the program were: a) to create an integrated message that addresses the broad spectrum of eating-related problems; b) to discuss general parenting skills, what is a “good enough parenthood,” and what type of parenting can prevent weight related problems; c) to promote modeling of a healthy life style; d) to promote a healthy environment for the emotional growth of the child’s self-esteem, practice and to model self-care; e) to reconcile the joint needs of children for nurturance and limit-setting by shaping parenting styles and family characteristics, and f) to choose preferable food practices to prevent weight related problems.

**The Conceptual Model**

The program is family-based and health-centered, aiming to induce environmental change as well as
change in parents’ cognition, modeling, and parenting practices (32). It emphasizes healthy eating patterns. Parents are encouraged to decrease exposure to obesogenic foods (by decreasing the variety and quantities of calorie-dense items, high fat foods and purchased sweets e.g., french fries, ice-cream, cake, cookies, snacks, pizza); to establish designated times for family meals; to provide companionship at mealtime; to allocate individual portions; to establish a positive atmosphere, and to model appropriate food-related behaviors to promote improved dietary quality. The whole family is encouraged to develop a healthy lifestyle and awareness of internal hunger and knowledge cues; to be more critical of media messages; to de-emphasize thinness and weight reduction; to address their emotional needs by expressing feelings; and to nurture the child. Cognitive behavior modification education is also applied, such as setting realistic goals and self-monitoring of food-intake as well as types and frequency of activities, social reinforcement, restructuring of maladaptive thoughts, problem solving and self-reinforcement) (33,34).

Parental practices are addressed in the context of general parental strategies of expressing warmth and emotional support, and using clear, bi-directional communication. Coping techniques are discussed to encourage and foster an authoritative parenting style, emphasizing both “responsiveness and demandlessness”, attempting to balance parents’ conformity demands with respect for their children’s individualism, and aimed at the child’s development of responsibility and positive self-image (35,36).

Parents are encouraged to foster an authoritative feeding style in which adults determine which foods enter the home, and how they are prepared and offered, and where they also select the place where they dine out, while children determine the amount eaten (37,38). The sessions’ content is guided by the model that was developed by the author (32) and presented in Figure 1.

Participants

Families who had at least one overweight or obese child (above the 85th BMI percentile) (39) were invited to participate in parental counseling. Both parents were asked to participate in sessions. Exclusion criteria included current participation of any family member in a weight loss program, restriction regarding participation in a physical activity program for children and parents, or the diagnosis of psychiatric or major endocrine pathology.

Group facilitators

The research groups were led by clinical dietitians who were supervised by a family therapist. In the community-based health promotion groups, the group facilitator may be a clinical dietitian, health promoter, family therapist social worker, psychologist, or group therapist. In the presented data, two-thirds of the groups were directed by a clinical dietitian who co-directed the group with a social worker who specializes in group therapy or family therapy, and one-third were delivered by a clinical dietitian, social worker, or pediatrician working alone.

The group facilitators were supervised by a psychotherapist, who was a specialist in group therapy and family counseling. The staff training in the reported project included 40 hours of education on interactive workshops, focusing on the theory and practice behind what is delivered and how it is presented in the parents’ groups (information with respect to childhood obesity as well as about parenting, motivational interviewing, and counseling skills). Thereafter, 12 group supervision sessions of 3 hours each took place, with 10–15 supervisees in each group. The supervision sessions focused on counseling skills; approaching participants in a creative and motivating manner; addressed issues of motivation and drop-outs; coping with resistance; acknowledging counter-transference feelings, and reactions endorsed in the three parallel processes (supervisor-group leaders, group leaders-parents, and parents-offspring).

The content of each is session in outlined in Table I. In addition, 40–50 minute individual appointments were offered to those who needed extra support. In the research studies, one-third of the families needed an individual appointment once or twice during the program. In the community-based health promotion groups, less than 20 percent of the parents needed these individual appointments and they mainly served to update those who had missed a session.

Measurements

In the research studies, anthropometric measurements (of child and both parents) were performed at baseline, at program termination (after six months), and 12 months after program termination. Participants (parents and children) were weighed once a month, while wearing light clothing and no shoes. The child’s overweight was calculated by: (child’s current BMI–child’s 50th percentile BMI)/child’s 50th percentile BMI × 100. The children’s BMI z-scores were calculated based on the LMS method.
The parents’ weight status was evaluated using BMI.

In the research protocol, each family completed 7-day food and activity diaries, which were validated by a 24-h recall. Parents in both groups completed the Family Eating and Activity Habits Questionnaire (40) at the beginning and termination of the program. This questionnaire measures the obesogenic factors in the environment (eight items); physical activity (four items); the relationship of eating to hunger (four items), and the eating habits of the obese child and his parents (13 items). Mean r for Cronbach’s alpha was 0.83 (internal consistency). The total score for test-retest Pearson correlation coefficient was $r = 0.85$ ($p < 0.01$) (40). The total family score was higher in families with an obese child compared to families with a normal-weight child ($p < 0.01$), thus indicating its validity (40).

Parenting style was measured using The Parental Authority Questionnaire (41,42), which measures Baumrind’s permissive, authoritarian, and authoritative parental authority prototypes (35,36). In the community-based public health care groups, the same measurements were taken at baseline and at termination without the food records.

**Statistical Analysis**

Statistical analysis used the Statistical Analysis System (SAS Institute, Cary, NC). The study was designed to detect differences of 10% weight loss with a power of 90% and a significance level of 0.05, given a dropout rate of 10% with a sample of 12 in each group, based on variation defined in a previous
study by Golan et al. (33). One-way analyses of variance (ANOVAs), with Bonferroni tests to correct for multiple comparisons, were conducted to explore between group differences at baseline for parents’ and children’s data.

Group differences in percentage overweight and BMI z-score were analyzed using mixed model repeated measure ANOVA, with treatment group as the between factor, and time as the within factor, with linear contrasts used to follow significant main effects or interactions. In analyses, missing values were replaced with baseline values. Changes in lifestyle behaviors from baseline to the end of the intervention were assessed using chi-square test, t-test, and analysis of covariance (ANCOVA). Pearson’s correlation coefficients were used to determine associations between numerical variables.

Results of the Randomized Clinical Trials

Parents-only vs. Children-only

The suggested model was first tested during 1994 – 1996 in 60 obese children aged 6 to 11 years (mean age 9.2 years), all of whom were above the 85th BMI percentile. They were randomized to two conditions: one intervention targeting parents-only and the other targeting children-only.

In the children-only group, children were targeted with a conventional dietary intervention (6.3 MJ/day). Children were taught to follow a balanced diet; to increase physical activity, and to decrease sedentary behaviors through controlling food stimuli; practicing problem solving and cognitive restructuring, and use of social support. Each child attended 30 one-hour group sessions conducted by a clinical dietitian during the one year intervention. The sessions were held weekly for the first two months and then bi-weekly. Individual counseling was provided when a participant missed a session or needed extra help.

In the parent-only (experimental) group, change was delivered through the parents (instead of the obese child), emphasizing a healthy life style and not weight reduction. Each group attended 14 one-hour sessions, starting with four weekly sessions, then four bi-weekly sessions, the remaining six sessions were held once every six weeks.

The drop-out rate was 10 times greater in the children’s group compared to the parent-only group (30% vs. 3%) (33). Children in both groups showed a significant decrease in percentage overweight after 12 months. However, superiority was observed in the parents-only intervention, with 15% weight reduction at program termination in the parent-only group compared with only 8% in the conventional group (p <0.03) (33). At the end of the intervention,
35% of the children in the parents-only group reached a non-obese status, whereas in the child-only group, only 14% reached non-obese status. χ² analyses revealed a significant difference between the two groups in the percentage of non-obese children at the end of the intervention (p < 0.01) (43).

At the 1 year follow-up, the children-only group had gained 7% of the 8% reduction in overweight, while the parent-only (experimental) group gained only 3% of the 15% reduction in overweight (p < 0.05) (33). 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 2) (33).

At the long-term (7 year) follow-up, weight status in both groups had changed markedly, probably due to the developmental stage of the children when this follow-up occurred (43). 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 (43). However, the results were consistent, with marked superiority to the parent-only group compared with the children-only group (29.2% vs. 20.3% reduction in overweight from baseline, respectively, p < 0.05). 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 classified as non-obese. χ² analysis revealed a significant difference between the two groups in the rate of the children's non-obese status 7 years after the intervention terminated (p < 0.01) (43).

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. This was expressed at the 12-month follow-up by the greater reduction (p < 0.01) in stimuli at home (sweets and snacks), which was observed in the parent-only group (34). The children in this group showed higher consumption of healthy foods and a greater decrease in calorie intake than children treated with the conventional dietary intervention, assessed using 7-day food records kept by the parents in each family and validated by a 24-hour recall. This change was correlated positively (r = 0.43; p < 0.001) with the reduction in calorie intake (34).

Children's problematic eating behaviors (eating between meals, eating while standing or while doing another activity, and eating in relation to stressful situations) also showed greater improvement in the parent-only group in comparison to the child-only group (34). Parental modeling seems to be one of the mechanisms explaining the differences between groups. Parents in the parent-only group lost weight, in contrast to no change in parental weight status in the child-only group (p < 0.05) (33). Improvement was also observed in fathers' fasting plasma glucose (p = 0.02) and triglyceride levels (p < 0.05), and in mothers' insulin (p < 0.05), LDL cholesterol and total cholesterol levels (p < 0.05), but only for those in the parent-only groups (44).

![Figure 2. Weight status of children in the Parents-only vs. Child-only treatments: At baseline; At program termination (1 year); 7-years after termination.](image-url)
Pearson correlations showed significant correlations between the number of children in the family and the reduction in obesogenic load. The greater the family size, the lower the reduction in number of obesogenic food items in the house \( (r = -0.54; p < 0.01) \) and less improvement in frequency of eating behaviors that promote obesity (eating while watching TV, while standing, or in negative situations; \( r = -0.43, p < 0.01 \)). The fewer children in the family, the greater the increase in activity level observed among obese children \( (r = -0.56, p < 0.01) \) (34).

In conclusion, findings of this trial indicated that the parents-only group was superior to the children-only group in achieving desired outcomes.

**Parents-only vs. Parents & Obese Child**

Following the promising results of the initial clinical trial of the intervention, a second clinical trial was performed, comparing a parents-only condition and a parents & child condition (parents and children were targeted together) (45). Thirty-two families with obese children aged 6 – 11 years were randomized into groups, in which participants were provided with a comprehensive educational and behavioral program for a healthy lifestyle for 6 months (45). These groups differed in their main agent of change: Parents only vs. the parents and the obese child.

In the parent-only group, only the parents attended the program sessions. However, all suggested changes were intended for the entire family, as previously described (45). In both groups, parents were encouraged to foster authoritative parenting styles. In the parents and children group, both parents and their obese child attended the group sessions together. In this group, shared activities and discussions were planned to address the topics.

Only the intervention aimed at parents-only resulted in a significant reduction in percentage overweight at the end of the program \( (p = 0.02) \), as well as at the one-year follow-up \( (p < 0.05) \), with the differences between the two groups at both time points being significant \( (p < 0.05); \) Figure 3) (45). The mechanism for these differences may be attributed to the greater reduction in food stimuli in the home, as observed in the parents-only group. In this group, there was also a significant decrease in the amount of extra food that children took after they had finished their meal. Weight change was negatively correlated with the rate of mothers offering food to the child \( (r = 0.3, p < 0.01) \) and the mother's permissive style \( (r = -0.6, p < 0.01) \), and positively correlated with the level of physical activity \( (r = 0.6, p < 0.03) \) (45). Permissive parenting style is described as parents who tend to demand less from their children, allowing them to balance their behaviors and activities with few boundaries. In both groups, the parents’ weight status did not change. Regression analysis shows that the level of attendance in sessions explained 28% of the variability in the child’s weight status change, the treatment group explained another 10%, and the improvement in the obesogenic load explained 11% of the variability. A highly significant correlation was found between socioeconomic status and the improvement in the obesogenic load in the house \( (r = 0.69; p < 0.01) \) (45). The higher the socioeconomic status, the greater the improvement noted in the obesogenic behaviors \( (r = -0.4; p < 0.05) \) (45).

**National community-based health promotion groups – results of the first survey of an ongoing project**

In order to implement the parent-only treatment to practice in public health, Maccabee (one of the largest medical health organizations in Israel) supported a project in which 40 group facilitators recruited parents who had at least one obese child aged 4 to 18 years. Most clinicians delivered the groups with a co-facilitator, however, some delivered the groups by themselves.

The training program included a 5-day (40 hrs) teaching workshop for large groups, and twelve 3-hr sessions of smaller groups (10–15 supervisees in a group). In the supervision sessions, the supervisees presented their plans for the parents’ group sessions to the group. The supervision group acted as if they were parents who were participating in the counseling groups. In this way, supervision was given by the whole supervisee group as well as by the supervision group’s leader (Dr. Golan), while testing the “here and now” acceptance and response to each presented activity.

The supervision focused on counseling skills using the three parallel processes that exist in this multi-system: the interaction between supervisor and group leaders was explored and compared to what happens in the interactions between parents and group leaders, which could also be compared to the dynamics occurring in the relationship between parents and offspring. Information from one relationship was adopted in understanding and implementing the other systems of relationship. Therapists were taught to ask questions and “stir-up” clients, rather than lecture. The interactive group supervision aimed to nurture subjects professionally and personally, address negative feelings encountered during the process of delivering clinical intervention, combat causes of burnout, and also provide a forum to explore how to change the larger systems that influence clinicians’ work.
Only 70 children, of mean age 9.8 years, whose forms had complete data, were included in the analysis. Although the drop-out data are incomplete, it was reported through team meetings to be about 35% (personal communication). The results after 3 months, at program termination, are shown in Figure 4. There is a significant change in the children’s BMI from baseline: after 3 months, the children’s mean BMI changed from 23.3 ± 4.9 kg/m² to 22.8 ± 3.0 kg/m², a reduction of 0.5 ± 0.5 kg/m² (p < 0.001; paired t-test). There is also a shift of the BMI distribution curve to the right indicating that there are fewer children in the higher percentiles. In this study, a significant change in overweight parent status was noted as well (p < 0.01).

The association between family size and socio-economic status and outcome in health-centered weight management programs was also examined. A significant negative correlation was found between family size and improvement in obesogenic load (r = -0.52; p < 0.01): as family size increased, a smaller improvement in obesogenic load was observed. Significant interaction was found between change in the child’s BMI and number of children in the family (F = 13.6; p < 0.001). As permissive parenthood style increased, the obesogenic load at home increased as well (r = 0.64 p < 0.01) and less weight loss was observed (r = 0.47; p < 0.05).

**Discussion**

The studies presented here demonstrate that children who actively participate in psycho-behavioral education sessions, with or without their parents, had less weight reduction and behavioral changes when compared with children who did not attend these sessions. The disadvantage of the child’s presence in the intervention sessions might be attributed to the conflict they face when lifestyle changes are demanded. Lerner & Lerner (46) have suggested that children often resist change and express it by rebelling and acting appositively when they are subjected to such demands.

Epstein et al. (20,29) demonstrated that a weight reduction oriented program that targeted both the parents and children with information given in separate groups was superior over the child-alone condition (47–49). The apparent discrepancy between Epstein’s studies and ours may be due to the different settings. In our group studies, in the parent and child condition, both participants were seen in the same group, whereas children and parents were seen in separate groups in most studies by Epstein et al. Israel et al. (30) suggested that children are less inhibited, and thus participate more actively, when separated from their parents. Additionally, children behave more responsibly and are better controlled when they are treated separately from their parents. Moreover, targeting parents without, or separately from, their children, extends the topics that can be addressed in the intervention sessions. Targeting parents for improvement of parenting skills in the treatment of childhood obesity is widely supported by existing research (20, 22, 30, 48).

Our model focuses on environmental changes as well as on role modeling by the parents and change in parenting practices. In both randomized clinical trials the parent-only group showed a significantly greater improvement in reduction of overall obesogenic habits in the home compared to other groups.
Stepwise regression analyses have shown that the level of attendance of the agent of change in sessions, reduction in the obesogenic load in the home, and composition of the treatment group were the three dominant factors that explained the variability in child’s weight status.

The attendance data demonstrate a higher full attendance (both parents) in the parents-only group, in comparison to the child-only and to the parent and child condition (33,45). This may be due to fewer battles with resistant children who refuse to come to group sessions and may also be due to a stronger coalition formed by both parents towards change, since both were requested to attend sessions, while in the child-only group usually one parent brought the child.

Permissive parenting practices (45), with lower parental monitoring of children’s eating, meals, and TV viewing (50), and a lack of knowledge may support the inclusion, in weight management programs, of coaching parents about general parenting practices.

**Study limitations and future suggestions**

The parent-only condition encountered difficulties in recruitment. It is possible that parents prefer to project the responsibility for change on the child and may resist participating in parent-only counseling groups, as long as they consider the problem to be the child’s. More needs to be learned about ways to enhance parental motivation and compliance to participate in such programs and introduce change within the family. Assessing the family’s readiness to change may be suggested as the first step in increasing the rate of success in weight-management programs.

Due to difficulties in recruiting children to randomized clinical trials, our group was not able to compare the parent-only group and the parent and child group to a third condition where parents and children are targeted separately. Future studies should explore the efficacy of the parent-only group compared to parent and children groups in which the parents and the children are treated separately.

The parents’ role in weight-related problems should be further explored, especially in the light of current suggestions to integrate prevention of both obesity and eating disorders. The challenge lies in approaching weight-related problems with consistent messages and in making complex interventions simple in order to achieve successful weight related outcomes. Studies in which parents are the main agents of change should be repeated. Intervention studies are needed to gain insight into the suitability of the authoritative parenting concept, particularly its suitability for different ages and cultures.

Our results may not generalize to other ethnic and socioeconomic groups. The influence of ethnic background on parenting practices and children’s weight-related problems also merits further study. Further research is needed to explore the interaction between socioeconomic factors and change in the obesogenic environment and its influence on childhood obesity programs and outcome.

**Conclusions**

Management of childhood obesity should be addressed from the perspective of the whole family. It is in the home environment that the child first acquires health habits and parents play a pivotal role in modeling and creating healthy lifestyle norms. To
address the growing problem of childhood obesity, family-based interventions, with the parents as the main agents of change, are highly recommended. Such programs enhance parental leadership, parenting skills, and child-parent communication skills. They guide changing food consumption patterns, reduce sedentary activities, and induce increases in physical activity. Interventions should be tailored to the needs relevant to the family and be associated with their socioeconomic status, family size, parents’ education, and motivation to change.

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