

5 KEYS FOR HAPPY, HEALTHY FAMILY EATING:  
BRIDGING THE RESEARCH-PRACTICE GAP IN CHILDHOOD OBESITY  
PREVENTION BY ENGAGING WITH PARENTS AND COMMUNITY PARTNERS

By

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ABSTRACT OF THE THESIS

5 Keys for Happy, Healthy Family Eating:

Bridging the Research-Practice Gap in Childhood Obesity Prevention

by Engaging with Parents and Community Partners

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Approximately one-third of children and teenagers between the ages of 2 and 19 living in the United States today are considered overweight or obese. Previous research suggests that parents may play a complex role in the development of childhood overweight and obesity, and that parental over-control of child eating and feeding may put a child at particular risk for increased weight. Interventions to reduce parental over-control of eating have been developed, yet a research-practice gap exists in which recruitment of parents for such interventions has proven challenging. Using a previously studied intervention (*5 Keys for Happy, Healthy Family Eating*) to reduce parental control over child eating as a model obesity prevention program, the current study was comprised of two inter-related sub-studies. The goal of the first was to help bridge the research-practice gap by building community-research partnerships, identifying key recruitment strategies, and interviewing parents and community stakeholders to help elucidate barriers to parent

participation in prevention interventions. The goal of the second was to examine the effectiveness of *5 Keys* in reducing parental over-control of eating in the sample of participants successfully recruited for the study. In the first study, 11 collaborations were built, 6 sites were particularly active in participant recruitment for *5 Keys*, and 30 parents, participants, and community stakeholders were interviewed to identify key themes in parents' hesitation to engage in prevention initiatives like *5 Keys*. The following themes were identified: lack of time; parents' desire for a "convenient" program; parents' desire for family-based interventions; and parents' desire for "short and sweet" solutions. In the second study, 10 overweight parents completed the *5 Keys* intervention. By the end of five sessions, four of 10 demonstrated clinically meaningful reductions in parental pressure on child to eat and six of 10 demonstrated clinically meaningful reductions in parental restriction of child eating. Recommendations are made for how to engage with both community partners and parents to further refine *5 Keys* and similar obesity prevention interventions and test their effectiveness and acceptability by parents and community members.

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## **Introduction**

### **The Problem of Childhood Overweight and Obesity**

In the United States, overweight and obesity have more than doubled in children and adolescents over the past three decades, with approximately one-third of children and teenagers between the ages of 2 and 19 today considered overweight or obese (National Center for Health Statistics, 2012; Ogden, Carroll, Kit, & Flegal, 2012). The health effects of childhood obesity span both the immediate and long-term, and include increased risk for adult obesity, cardiovascular disease, certain types of cancer, and osteoarthritis (Freedman, Zuguo, Srinivasan, Berenson, & Dietz, 2007; Kushi et al., 2006; Li, Ford, Zhao, & Mokdad, 2009; Office of the Surgeon General, 2010). In addition, children and adolescents who are obese are more likely than their normal-weight peers to be stigmatized for their appearance and weight and exhibit low self-esteem (Daniels et al., 2005).

The causes of obesity are multi-faceted – culture, diet, genetics, physical activity, and the environment all play a role (Office of the Surgeon General, 2010) –, yet it appears from research examining parental and family influences on childhood obesity that parents may play a particularly complex role in the development of childhood overweight and obesity. A prospective study by Agras, Hammer, McNicholas, and Kraemer (2004) at Stanford University, for example, tracked 150 children from birth to 9.5 years of age, and found that parent overweight was a major risk factor for childhood overweight and obesity. In addition, studies of parent-child feeding strategies demonstrate a positive correlation between parental feeding restriction and children's food intake and weight (Faith, Scanlon, Birch, Francis, & Sherry, 2004). Finally,



laboratory studies demonstrate that parental control over eating, which includes parental pressure on child to eat, is associated with children's higher caloric intake and weight (Drucker, Hammer, Agras, & Bryson, 1999; Klesges et al., 1983). Taken together, the results of these studies suggest that parental overweight and parental over-control of child feeding are both major risk factors for childhood obesity – and it is believed that the parental over-control of feeding may be particularly problematic, as such control may interfere with a child's internal cues for hunger and satiety, leading to loss of control over eating, and eventually to increased weight (Agras et al., 2012).

Interventions to reduce parental over-control of child feeding have been developed. The Division of Responsibility Model (also known as “DOR” or the “5-Keys” Model) developed by Satter (1986; 1990), in which family members divide responsibility during meals such that parents take leadership in feeding but children learn to be self-directed in eating, is one conceptual framework that has spawned childhood obesity prevention programs endorsed by the American Academy of Pediatrics (Hagan, Shaw, & Duncan, 2008) and public health entities, including the Child Feeding Collaborative of Santa Clara County, California (Santa Clara County Public Health, 2013). In the first randomized controlled trial comparing the efficacy of a five-session intervention based on the 5-Keys Model to a control intervention focused on encouraging parents to increase their children's fruits and vegetable intake and physical activity and decrease their children's consumption of fats and sweets, Agras and colleagues (2012) found that the 5-Keys intervention was more effective in reducing the amount of pressure parents put on their children to eat.

### **The Problem of Dissemination and Implementation in Obesity Prevention**

Despite increasing evidence in support of the 5 Keys and similar parent education programs (e.g., Gerards et al., 2012; Golley et al., 2007; Slusser et al., 2012) for the prevention of childhood obesity, clinicians, researchers, and public health professionals continue to struggle in their efforts to close the research-practice gap in obesity prevention (Institute of Medicine, 2010). The dissemination and implementation of interventions to prevent and even treat childhood overweight and obesity are met with several challenges, not the least of which includes the recruitment of eligible and interested parents. As other researchers have note:

One of the challenging aspects of implementing interventions to prevent or treat childhood overweight and obesity is the recruitment of participants, which is often considerably more difficult than expected... Even if only the children and not their parents participate in the intervention, the parents may be the largest obstacle to recruiting children for participation in weight-management programmes. (Gerards et al., 2012).

Originally, the aim of the current study was to replicate the findings of Agras et al. (2012) within a benchmarking framework to determine whether, in a different research environment, the five-session 5 Keys intervention utilized by Agras and colleagues would continue to be shown effective in reducing parental over-control of eating. In their study, Agras and colleagues had recruited overweight parents of toddlers as participants by heavily advertising their study to community centers, day care centers, preschools, and university staff, and via newspaper classified ads and Internet sources such as Craigslist.org. In addition, they provided generous monetary compensation to participants for completing study assessments and attending all intervention sessions – and thus their study sample may not have been fully representative of the typical overweight parent concerned about his or her child’s weight. To recruit a more representative sample, the current study initially aimed to recruit overweight parents, with children between the ages

of 2 and 5 years, via referrals from physicians in a local Family Medicine clinic, for an open trial examining the effectiveness of the five-session 5 Keys intervention as a childhood obesity prevention program aiming to help parents reduce the amount of control they exert over their children's eating, with no monetary compensation provided for study participation and/or completion.

Initially, the local Family Medicine clinic appeared an ideal recruitment source. Family Medicine at Monument Square (FMMS), a division of the Robert Wood Johnson Medical Group in New Brunswick, NJ, provides a range of medical services, including pediatric care and health promotion for the overweight and obese – two services particularly relevant for the recruitment of participants in the study. In addition, the study received support from Dr. Cathryn Heath, Chief of the Division of Family Medicine, who believed recruitment would be possible through physician referrals and a search in the electronic medical record (EMR). The proposed study, however, faced major recruitment challenges from the outset. Racial, ethnic, and language barriers, as well as lack of patient follow-up, made it difficult for the study team to recruit solely from FMMS. Thus, the study team adopted a community-based approach to recruitment, with the study principal investigator (PI, J.Y.) building connections with community stakeholders (e.g., community center staff, day care center directors, and public health officials) to increase recruitment and shift the study from a benchmarking framework to a dissemination and implementation framework – in other words, to help those clinicians, researchers, and public health officials struggling to close the research-practice gap in obesity prevention understand how best to move an evidence-supported program from the research laboratory into the real world setting.

## **The Current Study**

Thus, the current study was comprised of two smaller and inter-related sub-studies. Study 1 had three aims. Similar to recent articles describing the barriers to implementing childhood obesity prevention interventions in clinical and community settings (e.g., de Silva-Sanigorski et al., 2012; Gerards et al., 2012), the three aims were to: (1) describe the process of building community-research partnerships; (2) describe the process of identifying participants for obesity prevention interventions; and (3) identify the barriers, as perceived by parents and community stakeholders, to participation in a parent-focused childhood obesity prevention intervention. Building on Study 1, Study 2 had one aim. This was to examine the effectiveness of the five-session 5 Keys intervention in reducing parental over-control of child feeding within the sample of parents successfully recruited for the study.

## **Methods**

### **Study Overview**

To help inform clinicians, researchers, and public health officials invested in the prevention of childhood obesity how best to translate an evidence-supported parent-focused intervention from the research to the community setting, the current study was comprised of two smaller sub-studies. Study 1 entailed concentrated efforts to build community-research partnerships with area day care centers, preschools, community centers, and libraries, as well as interviews with parents, participants, and community stakeholders assisting in and supporting recruitment to identify barriers to parent participation in the study intervention. Following recruitment of eligible parents for the study intervention during Study 1, Study 2 focused on examining the effectiveness of the

five-session 5 Keys intervention in reducing the amount of control participants exert in feeding their children.

**5 Keys for Happy, Healthy Family Eating.** Prior to describing the research methodology underlying Studies 1 and 2, it may be helpful to provide relevant information regarding the intervention utilized in the overall study.

The study intervention, *5 Keys for Happy, Healthy Family Eating* (hereon referred to as “5 Keys”), is based on Satter’s DOR/5 Keys Model, which emphasizes a division of responsibility between parent and child during meal and snack time (Satter, 1986; 1990). Parents take leadership in feeding their children by providing structure, support, and opportunities for healthful eating; they are responsible for providing regular and nutritious meals and snacks, organizing the family for meal and snack times, making eating times pleasant, and modeling appropriate mealtime behavior. Essential to this division of responsibility is parents’ trust that if they provide the necessary structure and support in feeding, children will learn to determine how much and whether to eat, allowing themselves to grow predictably (Satter, 2000). Thus, the aim of *5 Keys* is to reduce the amount of control parents exhibit in feeding their children so that their children learn to eat and grow healthfully.

As designed by Agras et al. (2012), *5 Keys* is comprised of five weekly, 45-60 minute, group sessions. The target audience includes overweight parents with children between the ages of 2 and 5 years. Sessions are facilitated by group facilitators who receive specialized training and supervision. Each session includes psychoeducation regarding the 5 Keys Model, discussion of common problems faced by parents during

family meal times, and use of behavior change principles such as monitoring, goal-setting, problem-solving, and homework (See Appendix for the full intervention manual).

**Study 1 Method.** To describe the methodology underlying Study 1, this section includes: (1) the protocol used to identify area day care centers, preschools, community centers, and libraries with which to build community-research collaborations; (2) the recruitment procedure used within each collaborative site; (3) a description of the interviews conducted with community stakeholders to understand the barriers to participant recruitment for *5 Keys*; and (4) the qualitative data analyses utilized to describe and report results.

***Community-Research Collaboration Protocol.*** To identify area day care centers, preschools, community centers, and libraries with which to build community-research collaborations, three tactics were employed. First, an Internet search was conducted to obtain available contact information for directors at day care centers and preschools in the area surrounding New Brunswick, NJ. Second, personal e-mails and phone calls were made to specific individuals identified, by a close colleague (Kimberly Convery, MSW) with experience leading community-based health programs, as key personnel in local health departments. Third, personal e-mails and phone calls were made to additional contacts identified through the network developed through the previous two tactics.

Once contact information was obtained for all key personnel at relevant area institutions, an introductory e-mail was sent by the P.I.; this introductory e-mail included a brief description of the study and the *5 Keys* intervention, as well as a request to schedule an in-person or phone meeting to discuss the study in more detail. The agenda for each meeting included an understanding of each institution's organizational structure

and programmatic needs, a detailed description of the study's aims and procedures, a detailed description of the *5 Keys* program, and discussion of potential recruitment strategies. If a response to the introductory e-mail was not received within one week, the P.I. sent a follow-up e-mail. If a response to the follow-up e-mail was not received within one week, the P.I. attempted a contact by phone. If the phone call was not returned, the institution was dropped as a potential collaborative site.

***Recruitment Procedures.*** Once all collaborative sites were identified, a recruitment protocol was established for each site. Whenever possible, active – rather than passive – recruitment methods were used, as research has demonstrated that active methods are more likely to attract eligible participants for childhood obesity interventions (Raynor et al., 2009). Active methods are those in which researchers take the initiative to identify and approach potential participants (e.g., by phone or mail), whereas passive methods are those in which potential participants must identify themselves (e.g., by responding to a mass advertisement; Lee et al., 1997). Recruitment methods utilized in the current study included searching a clinic database for potentially eligible individuals and sending them letters describing the study, receiving direct physician or community staff referrals, and connecting face-to-face with potentially eligible parents during community and school events.

***Parent and Community Stakeholder Interviews.*** To identify barriers to successful recruitment, interviews were conducted with individuals willing to provide insight into potential problems with the design of the *5 Keys* intervention. All parents – both those who entered Study 2 and those who refused study participation – and community stakeholders contacted during the process of building community-research

collaborations were invited to participate. Interviews were held in person whenever possible, or were conducted over the phone and via e-mail when necessary, by the P.I. Interviews lasted between 25 and 30 minutes. Similar to previous research using interviews to understand potential barriers to recruitment for childhood obesity prevention programs (e.g., Gerards et al., 2012), the parent and community stakeholder interviews were held in an open framework guided by focused and specific questions that allowed participants to respond the questions asked and elaborate on ideas for intervention improvement. Questions concerned parents' and stakeholders' attitudes towards childhood obesity prevention, evaluation of the *5 Keys* intervention, and barriers to participant interest and participation. Sample questions include: "What do you think makes the *5 Keys* program attractive to parents?"; "What can you identify as barriers to parent participation in the program?"; and "What would you do to problem-solve these barriers?".

#### ***Data Analyses.***

*Community-Research Collaboration.* To illustrate efforts and success in identifying collaborative sites, a listing of all institutions identified, personnel contacted, and collaborations built is provided.

*Recruitment Procedures.* To illustrate the recruitment protocol established for each site and evaluate its success, a brief description of the recruitment protocol and flow for each site is provided.

*Parent and Community Stakeholder Interviews.* To describe common themes regarding barriers to participant recruitment, as voiced by parents and community stakeholders during the interviews, the following qualitative analysis was undertaken.



First, all parent and community stakeholder interviews were transcribed. Next, all interviews were coded using the deductive approach to content analysis described by Miles and Huberman (1984) and relevant to health services research (Bradley, Curry, & Devers, 2007). In this approach, one or more guiding questions provide an organizing framework for coding or labeling the data. With these guiding questions in mind, a coding team is assembled and reviews each interview line by line, highlighting relevant phrases and creating “codes” or “labels” for each. Once coding is complete, the team then meets to review coding, resolve any discrepancies arising from independent coding, and group codes into themes.

For Study 1, the parent and community stakeholder interviews were organized around the following three questions: (1) What makes *5 Keys* attractive to parents?; (2) What prevents interested parents from being able to participate in *5 Keys*?; (3) What are potential strategies to increase recruitment for and participation in *5 Keys*?. The coding team consisted of the PI (J.Y.) and an additional clinical psychology graduate student blind to participants’ identities but familiar with qualitative analysis (Molly Tanenbaum, M.S.). The two coders first independently reviewed the interviews, then met to review coding and generate a complete list of codes that were grouped into themes. As recommended by Russell and Gregory (2003), an audit trail documenting decisions made at each stage of the analysis was utilized to maintain dependability of the data. Prominent themes, supported by participant quotes, are provided.

**Study 2 Method.** To describe the methodology underlying Study 2, this section includes: (1) an overview of the overall design of Study 2; (2) a description of participant inclusion and exclusion criteria; (3) an outline of the training and supervision for group

facilitators; (4) a summary of the measures given to participants; and (5) the data analytic strategy utilized in Study 2.

***Study 2 Design.*** Eligible participants who expressed interest in and availability for the five-session *5 Keys* intervention during the recruitment phase of Study 1 were entered into Study 2. Study 2 required participants to attend five weekly sessions of the *5 Keys* intervention, as well as complete questionnaires prior to beginning and after completing *5 Keys*. Due to the programmatic needs of participating collaborative sites, children were allowed to attend sessions with their parents; however, because the study aimed to modify parental attitudes and behaviors, only parents were considered participants in the study.

***Participants.*** Participants were 10 overweight parents (body mass index [BMI] equal to or greater than 25 kg/m<sup>2</sup>) with children between the ages of 2 and 5 years. Participants were identified through the recruitment procedures utilized at the collaborative sites identified in Study 1. To be eligible for the study, parents had to be able to read and speak English in order to be able to complete study questionnaires and participate in the *5 Keys* group-based intervention. Parents who met inclusion criteria for the study were excluded if they were pregnant or reported any cognitive or physical impairment that would interfere with their participation. All participants provided written, informed consent to participate in the research study.

***Facilitator Training and Supervision.*** Three second-year graduate students in clinical psychology were trained as group facilitators for the *5 Keys* intervention. Training was conducted by the P.I., who also served as one of the group facilitators, and consisted of the following four components: (1) reading a text outlining the DOR/5 Keys

Model (Satter, 2000); (2) reading the *5 Keys Therapist Manual*, originally developed for use in the Agras et al. (2012) study; (3) participating in web seminars hosted by the Ellyn Satter Institute; and (4) viewing feeding and therapy vignettes made available by the Ellyn Satter Institute. These four components were integrated into three separate two-hour training workshops that included review of didactic material, active discussion of family eating and feeding problems, and role playing of scenarios likely to arise in group sessions (e.g., participant confusion regarding the 5 Keys Model).

In addition, group facilitators received weekly supervision as they conducted 5 *Keys* groups. Each group session was audio-recorded. Prior to each supervision meeting, the P.I. reviewed relevant audio-recordings; during each supervision meeting, the P.I. provided feedback from her review to the facilitators. Feedback included comments regarding facilitators' adherence to the 5 Keys Model and assistance in problem-solving participant issues.

**Measures.** The following measures were administered at the assessment points indicated below.

*Child Feeding Questionnaire (CFQ; Birch, Grimm-Thomas, Markey, Sawyer, and Johnson, 2001).* The CFQ was administered at baseline (BL) and post-treatment (PT). The CFQ is a 31-item self-report questionnaire used to assess parental attitudes, beliefs, and practices regarding child feeding. Two of the CFQ subscales – Pressure to Eat, measuring parental pressure on child to eat, and Restriction, measuring parental restriction of child eating – were administered in the current study. Items to assess Pressure to Eat include: “My child should always eat all of the food on her plate.” Items to assess Restriction include: “I have to be sure that my child does not eat too much of

her favorite foods.” For each item, participants are asked to rate how often they endorse the given statement, on a scale of 1 to 5, with 1 indicating “never” and 5 indicating “always”. The scale has a reliability of 0.70 (Birch et al., 2001).

*Client Satisfaction Questionnaire (CSQ; Larsen, Attkisson, & Hargreaves, 1979).*

The CSQ was administered at PT. The CSQ is an 8-item self-report questionnaire used to assess participant satisfaction with a program, intervention, or treatment. Items include: “How would you rate the quality of the service you received?” and “If a friend were in need of similar help, would you recommend our program to him or her?” Participants are asked to respond to items on a 4-point scale, ranging from “excellent”/“yes, definitely” to “poor”/“definitely not”. The scale has a reliability of 0.82 (Attkisson & Zwick, 1982).

*Demographic Information.* Demographic information was collected at BL and included participant age, gender, race, ethnicity, education, and household income, as well as his or her child’s age, height, and weight.

*Data Analyses.* Participant demographics are described using frequencies, means, and standard deviations. BL-to-PT changes in the primary outcome measure of parental pressure to eat, as well as in the secondary outcome measure of parental restriction of eating, are reported using Standard Error of Measurement (SEM; Anastasi & Urbina, 1997). SEM has been used in other studies (e.g., Wyrwich, Nienaber, Tierney, & Wolinsky, 1999) to provide a standardized metric of individual within-subject change on a particular instrument or measure. SEM is calculated using the following formula, where  $\sigma$  = standard deviation of the instrument and  $r$  = reliability of the instrument.

$$SEM = \sigma\sqrt{1 - r}$$

In addition, PT scores for client satisfaction are reported.

## Results

### Study 1

Results for Study 1 are presented as follows: (1) a listing of all area institutions contacted, personnel reached, and community-research partnerships formed; (2) a description of the recruitment procedures developed for each collaborative site; and (3) demographic data for all parents and community stakeholders interviewed, followed by an outline of prominent themes regarding barriers to parent participation in the *5 Keys* intervention.

***Community-Research Collaboration.*** Table 1 (See Appendix for all Tables and Figures) documents all institutions identified, key personnel contacted, and collaborations formed within the community surrounding New Brunswick, NJ. Of the nine day care centers and preschools identified, four collaborated with the research team. Of the four community organizations identified, all four collaborated with the research team. Of the two local libraries identified, both collaborated with the research team. In addition, as originally proposed, FMMS continued to collaborate with the research team.

***Recruitment Procedures.*** Table 2 provides the recruitment strategies used within each of the collaborative sites and the resulting participant flow. Two active recruitment strategies – the e-mail sent by the Woodbridge Moms Club President to select members and the face-to-face interaction between the P.I. and parents attending the Woodbridge Public Library’s Preschool Story Time – were most successful in identifying and entering participants into the study. Of the 20 parents identified as potentially eligible participants through these active methods, 10 were entered into *5 Keys* groups. Other active strategies, such as sending of letters to potential participants identified via EMR search and

physician referrals at FMMS, were successful in identifying potential participants, but unsuccessful in encouraging them to enter the study. Passive strategies, namely the distribution of study advertisements to all parents at collaborating day care centers and preschools, were unsuccessful in both identifying and recruiting potential participants.

***Parent and Community Stakeholder Interviews.***

*Parent and Community Stakeholder Demographics.* Interviews to understand barriers to parent participation in the *5 Keys* intervention were conducted with a total of 30 parents and community stakeholders. These were: the 10 parents who were entered as participants into Study 2, 6 parents who had initially indicated interest in the *5 Keys* intervention but were unavailable for Study 2, 5 day care center directors, 2 public health officers, 2 librarians, and 5 family physicians. All community stakeholders participating in the interviews were key personnel from one of the collaborative sites.

Demographic data for parents and community stakeholders interviewed are depicted in Table 3. Of the 30 parents and community stakeholders interviewed, the majority were women ( $n = 28$ ) and most ( $n = 18$ ) were between the ages of 31 and 40 years. Of the 14 community stakeholders participating in the interviews, all but one had at least 5 years of experience in their profession.

*Qualitative Analysis of Parent and Community Stakeholder Interviews.* When asked to discuss barriers to parent participation in the *5 Keys* intervention, parents and community stakeholders evoked four themes: (1) time as a barrier to participation; (2) the desire for a “convenient” program; (3) the desire for family-based interventions for childhood obesity; and (4) the desire for “short and sweet” solutions.

Time as a barrier to participation. Both parents and stakeholders identified time as a barrier to parent participation in the *5 Keys* program. Many parents stated that given family, household, and occupational demands, they did not have the time to commit to a five-week program.

My husband and I just can't find the time to regularly attend meetings. We work during the day, try to get our kids fed, bathed, and settled at night, and travel as a family on the weekends. (Mom, was not available for study)

Stakeholders, too, indicated that the program was too lengthy for parents.

Community-based programs, especially those hosted by community health centers in townships like Edison and Woodbridge, are often one-time workshops or programs that do not require regular attendance. Therefore, even parents interested in the information offered by the *5 Keys* program may have been discouraged from attending because of their experience and familiarity with other, shorter and less time-consuming, community programs.

We run a lot of one-time programs, so I think with [the *5 Keys*] program, time is a big barrier... I think there is still stigma amongst parents against wanting to commit to a program that is more than one time. (Public Health Official)

When asked why community-based programs choose to run one-time programs, stakeholders expressed their own difficulty in getting parents to attend programs and the need to reserve resources.

It tends to be difficult for us to even get parents to come in to the library in the first place. If we ran a program for several weeks, knowing there would be poor attendance, we would be wasting staff time and other resources. The only long programs we run successfully are those that repeat, where parents can come and go as they please without missing any information. (Librarian)

The desire for a "convenient" program. Related to the notion of time as a barrier to parent participation in the *5 Keys* program, both parents and stakeholders noted the

need for the *5 Keys* and similar programs be more convenient for parents. According to those who were interviewed, a convenient program was one that fit into parents' existing routines – one that was conveniently timed, conveniently located, and offered incentives such as childcare and snacks.

For example, several parents indicated that a program held during the lunch hour and located in or near their workplace would allow them to participate in a longer program.

Holding the meetings during regular business hours would be better for me. I know a couple of parents at [my workplace] that would be interested and able to attend if you could travel to our office. (Mom, was not available for study)

Parents and stakeholders additionally indicated that a program held at parents' respective day care centers or preschools during extended care hours would allow parents to participate in the program while satiating their need for childcare.

This program could be really successful if you held it in one of the day care centers at the end of the day, so that parents could come from home or work, sit in group with peace of mind that their kids are being watched, and then go home. (Day care center director)

Parents stated that an ideal program would be held in a location to which they often traveled, such as their children's day care center or preschool, the library, or the YMCA.

I am more likely to commit to a program that's held in a location I'm familiar with, like [my son's] day care, especially if the program is held during day care hours. (Mom, not available for study)

We come to the library every week. It's easy for us to come to the library, attend the program, and then pick out some new books. (Mom, entered into study)



Parents and stakeholders also stated that an ideal program would offer childcare irrespective of location, so that parents could attend sessions while keeping their children engaged in an alternate activity.

It would be really helpful if you could offer child care, so that I have the opportunity to participate without worrying about my son. (Mom, entered into study)

Offer sitters for children while parents are learning. Sitters can play games, help with homework, or just increase activity time. (Public health official)

Additional incentives suggested by stakeholders in particular was provision of light meals and snacks to provide live examples of healthful and nutritious foods, as well as entice parents to participate by lightening their to-do load.

Offer a light meal. It will satisfy parents' meal time to-do. You could offer something that you would suggest as a family meal or snack. (Public health official)

Finally, stakeholders indicated that an ideal program would complement or combine with existing community programs. For example, the YMCA of Metuchen, Edison, and Woodbridge envisioned a one-time program that could fill the agenda of a monthly parent focus group. The Woodbridge Public Library similarly envisioned a program that would allow parents to be engaged in education while children were read to as part of the library's seasonal pre-school reading group.

Desire for family-based interventions. Parents and stakeholders also indicated that a family-based, rather than parent-focused, intervention would be more appealing to parents. According to both groups, a family-based intervention would allow parents to spend more time with their children, relieve any pressure to find child care, and allow for active learning with parents modeling healthful eating and proper meal-time behavior for their children.

Could kids be part of the program? My husband and I are so busy on the weekdays that any time we have is meant to be family time. If our kids could come to classes with us, we would be more likely to be able and interested. (Mom, not available for study)

Instead of providing child care during the sessions, maybe you could allow kids to be part of the classes. As we are learning how to feed our kids, they could learn how to eat. We could even do a live demonstration of a small family meal, with you coaching us through it. (Mom, entered into study)

Family-based interventions are key... Doing interventions that target just kids or just parents is not going to lead to long lasting results if the parents don't have an opportunity to model positive eating and exercise habits. (Public health official)

Desire for “short and sweet” solutions. Finally, parents and stakeholders expressed a desire for “short and sweet” or “quick and simple” strategies to encourage healthy family eating. Ideas ranged from providing parents with just one or two tips to improve their family’s diet, to providing specific recipes for healthful meals and snacks.

Parents are anxious and busy. They just want to know what to do. If you can get them that information quickly, maybe in 1-2 sessions instead of 5, you would be more successful. (Public health official)

When parents come to us with concerns about their kids’ eating or weight, we try to give them one really direct suggestion because they will often go months without coming back to the clinic. I always tell parents to cut out soda and juice. (Resident physician)

I really appreciated the simple suggestions I got from you and other parents, especially for healthy snacks. (Mom, entered into study)

## **Study 2**

Results for Study 2 are presented as follows: (1) a flowchart of participant referral, eligibility, and entrance into the study, as well as an overview of participant demographics; and (2) a description of primary and secondary outcomes regarding

parental pressure on child to eat, parental restricting of child's eating, and client satisfaction with the *5 Keys* intervention.

***Participant Referral, Eligibility, and Entrance into Study.*** Figure 1 provides a schematic of participant flow into the study. As previously stated, 11 collaborative sites assisted in recruitment for the *5 Keys* intervention. Six of these sites successfully identified a total of 184 potential participants for the intervention and three (two of which worked together) successfully coordinated with the study team to enter a total of 10 participants into two separate *5 Keys* groups.

The Woodbridge Township Health Department and the Woodbridge Public Library worked jointly to recruit community residents and library patrons for the study. They found a captive and interested audience in the library's Preschool Story Time, a seasonal weekly program for children between the ages of 3 and 5 years. Parents register for and accompany their toddlers to Story Time, and typically join their children on the floor to listen to the library's storyteller or sit back and engage with other parents. Each Story Time session lasts one hour. Five parents consented for the study after a brief presentation by the P.I. during a Story Time session. All *5 Keys* sessions, as well as BL and PT assessments, were conducted during Story Time to encourage parent participation while limiting disruption of parents' routines and reducing the burden of childcare and travel.

The Woodbridge Moms Club worked independently to recruit its own members for the study. The Moms Club organizes a number of activities for stay-at-home mothers in the community of Woodbridge, NJ, such as weekly playgroups and Moms' Nights Out. After learning about the study through the library's Story Time and speaking with the

P.I., the Club President personally identified and messaged five members to gauge their interest in participating in the study. All five consented. Because the Moms Club does not have a central meeting space and often relies on members to host events – and because the participating mothers felt it too burdensome to travel to the study team’s offices in downtown New Brunswick –, all study assessments and group sessions were conducted in a designated meeting space at the Woodbridge Health Department. Children were allowed to accompany their mothers to sessions to reduce the burden of childcare, but did not actively participate in the sessions.

Thus, a total of  $N = 10$  adults participated in Study 2. Table 4 provides participant demographic data. All 10 participants were female, with mean age of  $38.17 \pm 4.83$  years and an average BMI of  $27.55 \pm 1.56$  kg/m<sup>2</sup>. Nine (90%) were Non-Hispanic and eight (80%) were Caucasian. All 10 had received some college education and half of the participants reported a household income of at least \$90,000. Each participant had one child between the ages of 2 and 5 years, with an average age of  $3.33 \pm 0.68$  years. Six of the children (60%) were male. BMI-for-age and weight status for each child was determined using his or her parent’s report of child birth date, height, and weight. Among the 10 participants’ children, average BMI-for-age was  $17.07 \pm 2.11$  kg/m<sup>2</sup>. When BMI-for-age was translated into a growth percentile to determine weight status (CDC, 2013), six (60%) were considered to be healthy weight and four (40%) were considered to be overweight or obese.

***Parental Pressure to Eat, Parental Restriction of Eating, and Client***

***Satisfaction.*** Table 5 summarizes BL-to-PT changes in participants’ scores on the CFQ Pressure to Eat and Restriction subscales. Consistent with previous research, a criterion

of a change greater than 1 SEM to define meaningful individual change was used (Wyrwich, Nienaber, Tierney, & Wolinsky, 1999). The SEM for the CFQ Pressure to Eat subscale was calculated as 0.52; the SEM for the Restriction subscale was calculated as 0.41. Four of 10 participants demonstrated a >1 SEM reduction in Pressure to Eat. Six of 10 participants demonstrated a >1 SEM reduction in Restriction. At PT, mean client satisfaction with the program was  $27.0 \pm 5.54$  (out of a possible 32).

### **Discussion**

The original aim of the current study was to further investigate the effectiveness of a group parent intervention for the prevention of childhood obesity, *5 Keys for Happy, Healthy Family Eating*, in reducing parental over-control of feeding. Early difficulties with recruitment, however, necessitated a more practical investigation aimed at understanding how to bridge the research-practice gap and allow for the dissemination and implementation of evidence-based interventions for the prevention of childhood obesity into community settings. The resulting study was comprised of two, inter-related, studies. Study 1 delineated the process of building community-research partnerships and recruiting eligible and interested parents for a prevention intervention, and identified barriers to parent participation in such an obesity prevention program. Capitalizing on the partnerships built in Study 1, Study 2 examined the effectiveness of the *5 Keys* intervention in reducing parents' control over their children's eating among the sample of parents successfully recruited for the study.

The process of identifying area institutions and connecting with key personnel in the pursuit of building community-research partnerships in Study 1 underscores the necessity of locating advocates, champions, and leaders within each collaborating site

and forming one-on-one relationships with such individuals. Doing so is a must if researchers wish to see their interventions move outside of the laboratory setting. Previous researchers have noted that forming these kinds of relationships builds trust and respect between researchers and their community partners (e.g., Horowitz, Robinson, & Seifer, 2009) – and that such trust and respect allow partnerships to outlast disappointments and frustrations in funding and work (Israel, Schulz, Parker, & Becker, 1998). Advocates, champions, and leaders are individuals who can help push program and intervention implementation forward by helping to engage additional staff and identify and entice potential consumers. During Study 1, it became clear that those individuals with whom the study team was able to forge personal relationships (e.g., those identified in Table 1 by a specific role rather than by a general “staff” label) were the most likely to be interested and invested in the study.

The process of specifying recruitment procedures within each collaborative site in Study 1 further emphasizes the importance of building mutually respectful relationships with community partners. Engaging community partners in all phases of research – for example, by allowing them to design recruitment and not just serve as a funnel for recruitment – balances the needs of the research team with the needs of the community in which the research is being conducted. It also allows for the translation of trust and respect between researchers and community partners into trust and respect between researchers and community members. Community members may be far more likely to participate in an intervention endorsed or introduced by a community partner with whom they already have a relationship than one that is introduced by a researcher with whom they are unfamiliar (Horowitz et al., 2009). Indeed, recruitment in Study 1 was most

successful when key personnel at the collaborating site personally recruited eligible individuals or personally introduced the study P.I. to potential participants.

The process of interviewing parents and community stakeholders in Study 1 also highlights the need to observe the limits that time, location, and other barriers may place on successful community-research collaboration and intervention implementation. An intervention may be shown effective in the laboratory or research setting – but when transported into the real world, it can only be as effective as people are able and willing to participate in it. Time has often been cited as a barrier to parent participation in childhood obesity prevention programs (e.g., Sonnevile et al., 2009); indeed, it became increasingly clear in the current study, through both recruitment and parent and community stakeholder interviews, that parents are unwilling to participate in an intervention that seems to require so much time. Five weekly, one-hour sessions of *5 Keys* simply seemed too long, too much, and overwhelmed parents who already felt the pressures of family, household, and occupational obligations. Furthermore, the five-session structure of *5 Keys* did not fit with the predominant one-workshop model of community-based parent education programs with which parents and community stakeholders were familiar. Nor did it reflect parents' desire for family-based interventions that allow for interactive learning, skill building, and modeling while reducing the burden of parents having to find childcare.

Thus, it is important not only to observe the limits that certain barriers place on parent participation in *5 Keys* and similar programs, but also to capitalize on community partnerships to fit empirically-supported and evidence-based interventions within the structure of existing programs. Doing so may elucidate the tension between maintaining

fidelity to an intervention as designed and the need to adapt a program to meet the needs of its consumers; however, developing “hybrid prevention programs” (Gonzalez Castro, Barrera, & Martinez, 2004) that maximize both fidelity and intervention effectiveness is of the utmost importance if researchers are to move evidence-based interventions out of research laboratory and into the community.

It is interesting to note that the results of Study 2 provide some evidence in support of *5 Keys* as designed. We witnessed clinically meaningful reductions in parental pressure to eat for four of 10 parents and in parental restriction of eating for six of 10 parents, indicating that *5 Keys* may help reduce parental over-control of eating. In addition, participants in Study 2 responded to the PT satisfaction questionnaire such that they indicated high satisfaction with *5 Keys*, and also provided oral and written feedback detailing their appreciation of the education, information, and support provided by group facilitators. However, despite these promising results, the flow of potential participants into the study was poor. That only 10 of 184 individuals initially identified by key community personnel as potentially eligible for the study actually entered the study speaks to the need to modify the structure of *5 Keys* so that it is accepted by parents.

### **Limitations**

Several limitations of the current study should be acknowledged. First, there is the risk in conducting interviews that participants will provide socially desirable responses (Gerards et al., 2012). In the case of Study 1, a socially desirable response may have been to minimize any dissatisfaction or hesitation regarding the design of *5 Keys*. Instead, parents and community stakeholders appeared rather forthcoming in identifying the intervention’s limitations and providing suggestions for improvement. Second, both



Study 1 and Study 2 had small sample sizes. In the case of Study 1, however, tremendous efforts were undertaken to include as many parents and community stakeholders as possible, and the resulting sample provided representation from several different area institutions. In the case of Study 2, the small sample size speaks to the need to re-think the design of *5 Keys*.

### **Conclusions and Future Directions**

Despite the limitations noted above, the study nevertheless has its strengths. These include the richness of data obtained from careful tracking of collaborative efforts, recruitment strategies, and parent and community stakeholder interviews. Furthermore, the study as it was completed has the potential to bridge the research-practice gap in obesity prevention by contributing to our growing knowledge of how best to work with intervention consumers and community partners to successfully disseminate and implement empirically-supported and evidence-based interventions. Specifically, the study provides important proof-of-concept for the conceptual model of implementation research put forth by Proctor and colleagues (2009), who view implementation as a process equally emphasizing the need for intervention strategies (e.g., evidence-based practices), implementation strategies (e.g., coordination between key stakeholders such as consumers, providers, and broader systems), and outcome measurements at the level of implementation, service, and client.

*5 Keys* had been shown effective in reducing parental control over eating in a previous study, yet its ability to be implemented in the community had not been tested until the current study. Strategizing implementation required back-and-forth discussion with and buy-in from all those who would come into contact with *5 Keys* – parents,

providers (e.g., the study team), key community personnel, and the organizations in which they worked –, not just the parents. Likewise, outcomes had to be measured at all stages of implementation. First, *5 Keys*' ability to penetrate into community settings – its ability to be implemented – had to be measured by the number of community-research partnerships formed. Second, its ability to reduce parental control over eating – its effectiveness and service – had to be measured through BL and PT assessments. Third, its ability to satisfy parents – its client outcomes – had to be measured by a client satisfaction questionnaire. In the absence of Proctor et al.'s framework, the study may have shed little, if any, light on the specific question of *5 Keys*' acceptability and utility as an intervention and the larger question of how to bridge the research-practice gap in obesity prevention.

Building on the findings from the current study, future work should aim to first refine *5 Keys* and similar programs in a way that is acceptable to parents and community stakeholders. According to those interviewed in Study 1, parents desire one-day workshops and/or family-based programs. It may be possible to adhere to the tenets of Satter's DOR/5 Keys Model within a one-day program; it may also be possible to keep the existing five-session structure of *5 Keys* by welcoming children and providing them and their parents with active learning experiences. Once the intervention is refined, researchers should use Proctor et al.'s model to work with parents, facilitators, community leaders, and community organizations to determine the best course for disseminating and implementing *5 Keys* in the community. As implementation occurs, data should be gathered that speak to *5 Keys*' acceptability, effectiveness, and sustainability as a prevention intervention. Important measures may be similar to those

utilized in this study, such as the CFQ and CSQ; they may also include the number of community sites willing to host the intervention and the number of intervention groups successfully run in each organization. Such work would have broad and important implications for the way in which clinicians, community leaders, parents, and researchers approach childhood obesity prevention.

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## Appendix A: Tables and Figures

Table 1

*Area institutions and key personnel contacted during formation of community-research partnerships.*

Institution Type	Site Name	Personnel Contacted	Collaboration Formed?
Day Care Centers and Preschools	Apple Montessori School	Director	Yes
	Heller Park Child Care	Director	Yes
	Little Flower Montessori School	Director	Yes
	Little Treasures Learning Center	Director	Yes
	New Friends Child Care	Staff	No
	Noah's Ark Preschool	Staff	No
	The Children's Center	Staff	No
	The First Class	Staff	No
	Yellow Brick Road Preschool	Staff	No
Community Centers and Organizations	Edison Township Health Department	Public Health Official	Yes
	Woodbridge Township Health Department	Public Health Official	Yes
	YMCA of Metuchen, Edison, and Woodbridge	Child Care Director	Yes
Libraries	New Brunswick Free Public Library	Principal Librarian	Yes
	Woodbridge Public Library	Children's Librarian	Yes
Medical Clinic	Family Medicine at Monument Square	Division Chief	Yes

Table 2

*Recruitment procedures utilized within each collaborative site and resulting participant flow.*

<b>Collaborative Site</b>	<b>Recruitment Procedure</b>	<b>No. of Referrals</b>	<b>No. Participants in Study 2</b>
Apple Montessori School	Study advertisements distributed to all parents	0	0
Heller Park Child Care	Study advertisements distributed to all parents	0	0
Little Flower Montessori School	Study advertisements distributed to all parents	0	0
Little Treasures Learning Center	Study advertisements distributed to all parents	0	0
Edison Township Health Department	"Program endorsement" e-mail sent by Public Health Official to collaborating child care centers and forwarded on by center directors to parents.	6	0
Woodbridge Township Health Department	(1) Study advertised in local newsletter. (2) Study conducted in partnership with Woodbridge Public Library.	15	5*
Woodbridge Public Library	PI introduced study to parents attending weekly Preschool Story Time.		
Woodbridge Moms Club	"Program endorsement" e-mail sent by Club President to select members.	5	5
YMCA of Metuchen, Edison, and Woodbridge	(1) PI distributed study advertisements during YMCA Healthy Kids Day. (2) PI introduced study during monthly parent focus group.	8	0
New Brunswick Free Public Library	"Press release" written by Principal Librarian and posted throughout library.	0	0
Family Medicine at Monument Square	(1) Letters sent to potential participants identified via EMR search and physician referral. (2) Study advertisements posted in clinic rooms.	150	0

\*Note: Woodbridge Township Health Department and Woodbridge Public Library worked as one unit during recruitment; thus, number of referrals and entered participants are for both sites combined.

Table 3

*Study 1 Parent and community stakeholder demographics (N = 30)*

<b>Stakeholder Identity</b>	<b>(N = 30)</b>
Parent	
Study 2 Participant	10
Non-Participant	6
Day Care Center	
Director	5
Public Health Officer	2
Librarian	2
Family Physician	5
<b>Gender</b>	<b>(N = 30)</b>
Female	28
Male	2
<b>Age</b>	<b>(N = 30)</b>
< 25	0
26 - 30	5
31 - 40	18
41 - 50	4
51 +	3
<b>Years in Profession</b>	<b>(N = 14)*</b>
< 5	1
6 - 10	10
11 - 20	2
21 +	1

\*Note: "Years in Profession" excludes data for parents.

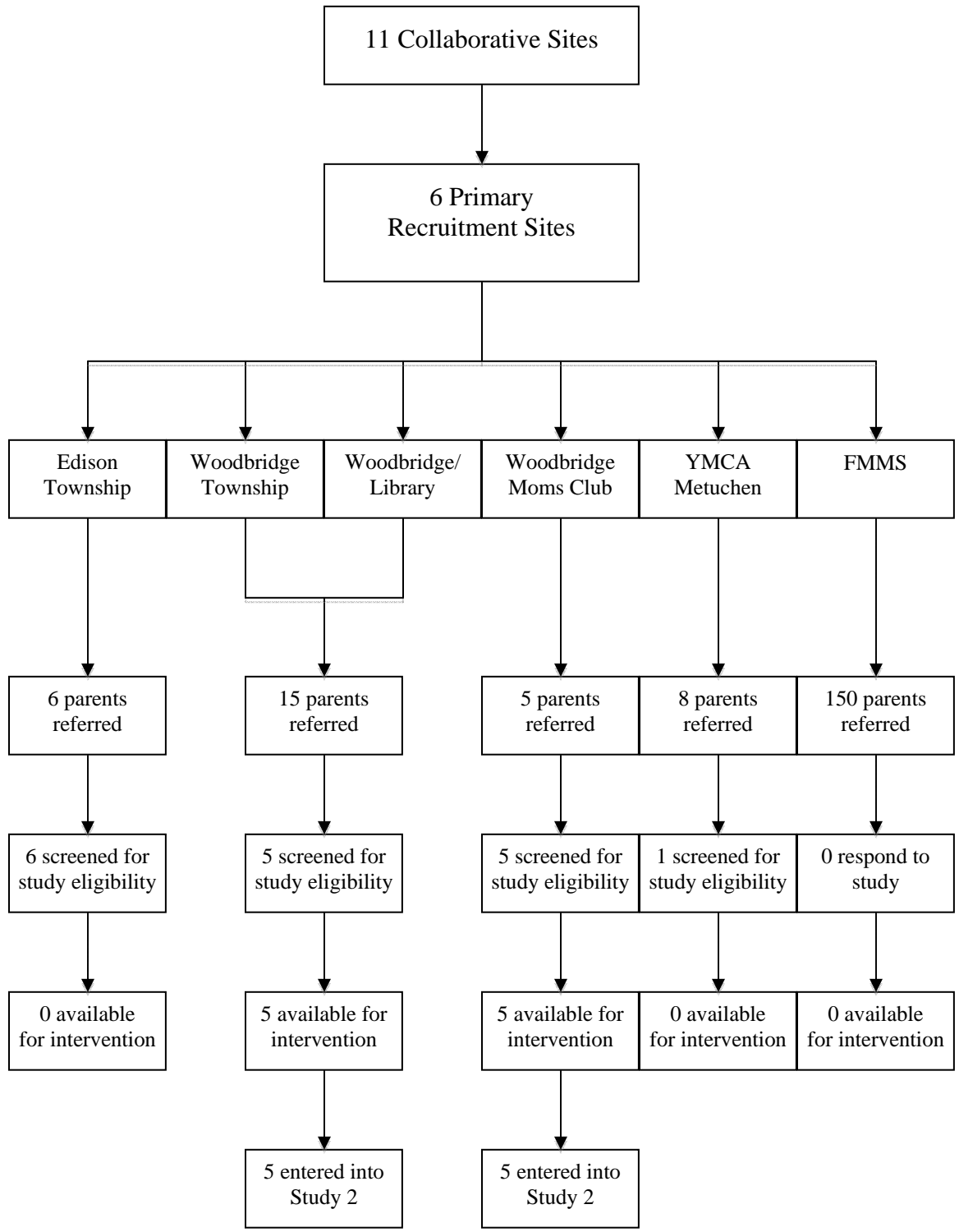


Figure 1. Participant flow into Study 2.

Table 4

*Study 2 Participant characteristics at BL (N = 10)*

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<b>Gender: n (%)</b>	
Female	10 (100)
Male	0 (0)
<b>Age: M (SD)</b>	
	38.17 (4.83)
<b>BMI: M (SD)</b>	
	27.55 (1.56)
<b>Ethnicity: n (%)</b>	
Hispanic	1 (10)
Non-Hispanic	9 (90)
<b>Race: n (%)</b>	
Caucasian	8 (80)
Other	2 (20)
<b>Highest Education: n (%)</b>	
Some College	1 (10)
2-Year College Degree	2 (20)
4-Year College Degree	2 (20)
Some Graduate/Professional School	4 (40)
Graduate/Professional Degree	1 (10)
<b>Household Income: n (%)</b>	
\$40,000 - \$49,999	1 (10)
\$70,000 - \$79,999	2 (20)
\$80,000 - \$89,999	2 (20)
\$90,000 - \$99,999	1 (10)
\$100,000 - \$149,999	2 (20)
\$150,000 +	2 (20)
<b>Child Gender: n (%)</b>	
Female	4 (40)
Male	6 (60)
<b>Child Age: M (SD)</b>	
	3.33 (0.68)
<b>Child BMI-for-Age: M (SD)</b>	
	17.07 (2.11)
<b>Child Weight Status: n (%)</b>	
Underweight (<5th Percentile)	0 (0)
Healthy (5th - 84th Percentile)	6 (60)
Overweight (85th - 94th Percentile)	2 (20)
Obese (>95th Percentile)	2 (20)

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Table 5

*Participants' BL-to-PT change in CFQ Pressure to Eat and Restriction subscales*

Participant	Pressure to Eat			Restriction		
	BL	PT	$\Delta$	BL	PT	$\Delta$
<b>1</b>	2.50	3.00	+0.50	3.50	3.00	<b>-0.50</b>
<b>2</b>	3.00	3.00	0.00	1.00	1.00	0.00
<b>3</b>	3.00	2.00	<b>-1.00*</b>	2.88	1.50	<b>-1.38</b>
<b>4</b>	1.50	1.25	-0.25	2.25	2.00	-0.25
<b>5</b>	2.25	1.25	<b>-1.00</b>	2.88	2.25	<b>-0.63</b>
<b>6</b>	2.00	1.50	-0.50	1.00	2.25	1.25
<b>7</b>	4.00	2.50	<b>-1.50</b>	3.75	2.50	<b>-1.25</b>
<b>8</b>	3.25	3.00	-0.25	3.38	3.00	-0.38
<b>9</b>	3.50	1.50	<b>-2.00</b>	2.25	1.25	<b>-1.00</b>
<b>10</b>	3.50	2.00	-0.50	3.00	1.25	<b>-1.75</b>

*\*Note:* BL-PT reductions in Pressure to Eat and Restriction > 1 SEM are indicated by **bold** typeface. SEM for CFQ Pressure to Eat = 0.52; SEM for CFQ 0.41.

**Appendix B**

**The Effectiveness of the 5-Keys Model for the Prevention of Childhood Obesity  
(5-Keys for Childhood Obesity)**

**THERAPIST MANUAL**

(Adapted from the Stanford Childhood Obesity Prevention Study)

**JUNE 2012**



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**This manual is adapted from:**

Satter E. (2007). Eating Competence: Definition and Evidence for the Satter Eating Competence Model. *Journal of Nutrition Education and Behavior*, 39, S142-S153.

**OVERVIEW**

This 5-session intervention is aimed at creating a mealtime environment conducive to healthy eating and to helping parents deal with mealtime problem behaviors by using simple behavior change procedures. The hypothesis is that 5-Keys program will enable parents to decrease their control over their child's eating and thus reduce the risk of childhood overweight. The 5-Keys program is really a parent education series in which parents meet in small groups, led by a trained facilitator, over the course of five weeks. Each group consists of approximately five parents. This intervention does not involve the child. One of the principal aims is to teach parents the basics of the 5-Keys program, as outlined below, so that they implement the whole program at home.

The 5-Keys program is adapted from the Satter Feeding Dynamics Model (ecSatter), a set of practice-based principles and recommendations addressing the relationship between parents (or other responsible adults) and children around feeding.<sup>1,2</sup> The fundamental principle of this model is that, provided parents do a reasonably good job with feeding, children learn to eat a variety of food as well as eat as much or as little as they need to grow predictably in the way nature intended for them. Effective feeding is based on a division of responsibility.<sup>2</sup> The parent becomes responsible for the *what*, *when*, and *where* of feeding, and the child becomes responsible for the *how much* and *whether* of eating.

Eating is a complex process made up of learned behavior, social expectations, acquired tastes, and attitudes and feelings about eating in general and about certain food items in particular. Satter's approach to feeding is based on the principle that internal cues of hunger, appetite, and satiety, if properly attended to, are reliable and can be depended on to inform food selection and guide energy balance and body weight. Those internal processes are supported by regular and reliable access to adequate amounts of rewarding and satisfying food. When attended to and supported, internal cues and management of the eating context are in dynamic equilibrium with predominantly genetically determined body weight, tendencies for movement, and the broader environment.

Within Satter's approach, nutritional adequacy is supported by variety. Variety is supported by satisfying basic needs for familiar and preferred food, which in turn supports mastery with an increasing variety of food selections. Accepting, relying on, and responding positively to inner cues with respect to food selection and regulation allows intrinsically rewarding nutritional behaviors and supports positive attitudes about eating. Among those intrinsically rewarding behaviors is managing the food context to provide regular and reliable access to plentiful and aesthetically rewarding food—food that is preferred by the individual.

## **PRINCIPLES AND PROCEDURES IN SATTER'S APPROACH**

### Broad Themes

- 5-Keys is parent-focused. Materials and programs address the parent's role in feeding.
- 5-Keys emphasizes the division of responsibility between parent and child in feeding.
- 5-Keys teaches child development as it relates to feeding. It gives accurate and concrete information identifying children's stages in feeding and parents' tasks in feeding in a stage-related fashion.
- 5-Keys teaches authoritative parenting as it relates to feeding. Authoritative parents maintain a balance between taking leadership with feeding on the one hand and giving children autonomy with eating on the other.
- 5-Keys assumes that children will learn and grow when parents provide them with a positive food environment.

### Parent Leadership

- 5-Keys teaches and supports parents in doing their tasks with feeding.
- 5-Keys prioritizes enjoyable family meals and sit-down snacks.
- 5-Keys stresses planning meals and sit-down snacks that offer children a variety of food of adequate caloric density.
- 5-Keys stresses avoiding between-times food and beverage handouts, except for water.
- 5-Keys encourages including all the food groups in meals, 2 or 3 of the food groups at snacks.
- 5-Keys encourages managing fat by including high-fat, moderate-fat and low-fat foods in meals and snacks.
- 5-Keys demonstrates how to appropriately and flexibly include in self-regulated quantities high-fat, high-sugar foods, such as chips, cookies and candy.
- 5-Keys manages fat, salt and sugar by emphasizing variety.

### Child Autonomy

- 5-Keys teaches and supports parents in trusting children to feed themselves.
- 5-Keys teaches parents normal child food acceptance behaviors with respect to eating some of what parents put before them and gradually learning to enjoy the food parents eat.
- 5-Keys teaches parents normal child food regulation behaviors with respect to children eating more during some meals or some days than others and varying from one child to another.
- 5-Keys teaches parents that children can be depended upon to grow in the way nature intended, even if weight is relatively high or low, provided it follows along a particular percentile curve on the growth chart.

### Approaches That Are Inconsistent with 5-Keys

- Child-focused materials and programs assigning children an independent role in food management.
- Directly or indirectly telling a child what or how to eat and what or how to weigh.
- Manipulating food selection for children in order to achieve a defined weight outcome.
- Directly or indirectly categorizing foods intended for children as good or bad (or even better and worse).
- Directly or indirectly categorizing types of family *meals* as good or bad, such as home-cooked (good) or fast food (bad).
- Directly or indirectly emphasizing children's eating certain foods or categorizing those foods as "healthy," such as fruits and vegetables, to the exclusion of other foods, such as sweets or chips.
- Directly or indirectly emphasizing children's eating low-fat foods or categorizing low-fat foods as "healthy," such as low-fat milk and dairy products.
- Directly or indirectly encouraging or endorsing any means for attempting to manage what or how much children eat, including motivating, reasoning, forcing, bribing, coercing, nudging, applauding, rewarding, explaining, teaching, restricting, tricking, running out of food or conspicuously modeling the eating of certain amounts or types of food.
- Directly or indirectly applying pressure on a child's weight and/or encouraging weight loss, for instance, talking about being "healthy" or "fit."

The ecSatter model outlines the division of responsibility in feeding and can be simplified into the 5-Keys as shown below.

### **5-KEYS TO THE DIVISION OF RESPONSIBILITY IN FEEDING (5-KEYS)**

**Parents** are responsible for:

- 1) **What** food is served
- 2) **When** food is served
- 3) **Where** food is served

**Children** are responsible for:

- 4) **How much** to eat
- 5) **Whether** to eat or not

Helping parents use the 5-Keys is the primary building block of the program.

\*Note: Some parents may come to the session mainly worried about their child's overweight or risk of becoming overweight, or being too thin or at risk of becoming too thin (i.e. by not growing). In this model, they should be told that if 5-Keys is put into effect then the child will develop to his or her optimal biologic weight.

#### Behavior Change Procedures

In addition to the 5-Keys, behavior change procedures are used to target "problematic" feeding behaviors. Such behaviors may stem from a child with a difficult temperament

leading parents to over-control a number of behaviors, including feeding. A central hypothesis underlying this program is that a child with a difficult temperament and an obese parent is at particularly high risk for the development of obesity because of parental over-control of their eating.

Behavior change procedures include reducing attention for difficult behaviors, attending to appropriate behaviors, judicious use of timeout, and teaching the setting of appropriate limits all within the context of an adequate food environment.

### Program Outline

*Session 1.* Basic principles about feeding children (introduce 5-Keys); identifying what parents are doing well; problem identification.

*Session 2.* Continued identification of what parents are doing well and what needs fixing to implement the program. Group discussion of problems and potential solutions, use of the 5-Keys and introduction of simple behavior change procedures based on problems identified.

*Sessions 3-5.* Parents continue to share experiences (successes and failures in implementing the 5-Keys and behavior change procedures) with guidance from the group leader.

## SESSION-BY-SESSION: SESSION 1

The therapist should introduce herself and then have the group members introduce themselves, including how many children they have and the name and age of their toddler. Then the leader should introduce the aims of the program:

*To help parents establish healthy feeding for their children, with a special focus on the 2-5 year old, in 5-sessions each lasting about 60-minutes. Today we will focus on a model to enhance healthy eating.*

As in all group therapy, it is important that the leader does not allow one participant to dominate the conversation. It is important that all participants are able to express themselves in the group. Some participants may need to be drawn into the discussions.

It is likely that not all the material under Session 1 will be covered in the first session. However, it is important to delineate the whole program but not all of the details under each element of the program. If you run out of time, simply cover any points that have been left out in the second session. As with all manuals the therapist does not have to slavishly follow the manual but rather present the material flexibly dependent on the needs of the group.

Before explaining the model, ask parents what concern or problem brought them to the group. You can write those concerns on a white board. Acknowledge that these are challenging and stressful behaviors/concerns. Then introduce the 5-Keys as a practice-based feeding model that has been shown to help parents with their feeding relationship with their child. In the following discussion of 5-Keys, the therapist can relate back to the stated concerns.

DISTRIBUTE THE 5-KEYS HANDOUT (See Appendix).

*Let me introduce the 5-Keys to the division of responsibility in feeding.*

**Parents** are responsible for:

- 1) **What** food is served
- 2) **When** food is served
- 3) **Where** food is served

**Children** are responsible for:

- 4) **How much** to eat (most parents push for the extra bite)
- 5) **Whether** to eat or not

*Let's look carefully at the division of responsibility in feeding children, beginning at 6 months of age when solids are introduced through the preschool years. These 5 responsibilities are the 5 keys to raising healthy and happy eaters. It may sound very scary giving children such important responsibilities. Most parents worry about this.*

The “my nephew story” about learning to kick a ball is appropriate here.

*I've been watching my 3-year old nephew, Jasper, as his Dad has been teaching him how to kick a soccer ball. I've watched his Dad roll the ball to him nice and slow, and I've seen Jasper kick or miss the ball time after time. Jasper's dad knows that Jasper won't kick the ball at first and that he will need lots of practice and guidance. His dad knows that Jasper will need to learn the rules of the game. Jasper's dad knows that he will become good at kicking the ball. Recently Jasper told me that he doesn't kick the ball very well yet, but that he will pretty soon.*

*Eating is similar. We often expect children to know how to eat; but eating is a skill that also requires learning and practice. For children to learn to eat requires a parent's patience and support to help children learn rules, skills, and behaviors.*

INTRODUCE CLASS ACTIVITY. Have them refer to 5-Keys Handout. As you go along, ask them to think about which elements they are doing well and which may need some attention. After some discussion of this, continue with delineation of parents' responsibilities in feeding their children. Remember that not all the details below need to be covered. It is more important to present the whole program. Details can be added in at the next session.

***Parents' Responsibilities:***

- What food is served?
  - Purchase and prepare the food that will promote good health.
  - Serve a variety of foods.
  - Offer your child the same food as the rest of the family, not just foods you know he or she will eat. No short-order cooking!
  - Remember that a meal should consist of: low fat milk or protein, vegetables, fruit, carbohydrates, and fat of some sort (butter, salad dressing, margarine, etc.).

*What is one thing that you are doing well right now regarding WHAT to serve?*

- When is food served?
  - Have structured meals and snacks
  - Establish a daily eating routine
  - As much as possible, have your child eat at the same time every day, and/or same time as the rest of the family.
  - Limit caloric beverages, including juice, between meal times.
  - Be consistent when establishing meal and snack times (don't wait for them to ask nor feed if out of time schedule, children should not be allowed free access to the refrigerator, snacks, etc. i.e. the parent is in control of when to eat)

*When does your family eat? What are you doing well regarding WHEN to eat?*

*It takes time, but children do adapt to schedules. And it can be done without being overly controlling. Let's use our football comparison. We know we must teach the rules of the game, and we keep reminding our children if they forget. The same parenting skill is need to help children learn that eating is done at certain times that the parent has decided on. Let's talk about the picky eater and this key (i.e. kid doesn't eat meal, begs for favorite snack afterwards). How do we handle this?*

- Where is food served?
  - Meal time is family time
  - TV off, no distractions
  - Not while walking, running, or playing
  - Not while being chased with a spoonful of food
  - Make eating times pleasant

*Where does your family eat? What are you doing well regarding WHERE to eat?*

*Mealtime is family time: eating with the family is the best way to teach children how to become healthy and happy eaters. Children watch what parents eat. Have the expectation that your child can learn to eat with the rest of the family. Research shows that children who eat in front of the TV eat food that is less healthy than those who don't, and tend to overeat. Children will become better eaters if there are rules about where eating is allowed. If eating is allowed everywhere, then it becomes more difficult for you to hold onto your responsibilities. In addition, following the model will help mealtimes be pleasant.*

You might want to add that where to eat refers to eating at home more often rather than at fast food restaurants.

*What do you think about having the TV on during mealtime?*

### ***Children's Responsibilities:***

- How much to eat?
  - Children are born knowing how much to eat
  - Children will eat a lot some days and very little other days
  - Children should not be forced to clean their plate or forced to eat even an extra bite

*You take over your child's responsibilities when you force them to eat, or restrict how much they eat. This can lead to overeating, sneaking food, & and other unhealthy eating behaviors. Children will learn to be better eaters and will enjoy being at the dinner table with you if you do your jobs of what, when and where. Parents need to trust the child in order to let them have control over how much. This is a hard key for most parents.*



*Can you let your child decide how much to eat? What problems do you see with this?*

- Whether to eat or not
  - Don't force your children to eat a food they hate, but continue to serve or offer it at meals
  - Do expect that your children will learn to like that food some day especially if they see you eating it
  - If you do your responsibilities, you can trust your child to eat

*They choose to eat from what you have provided, at that time, at that place. If they do not eat at that time they don't get to eat until the next scheduled time. If they leave the table the meal is over for them. Now that we have looked at the model let's see how it might help with some of the problems that parents encounter:*

- *Child is cautious about new foods (Child's Key)*
- *Child tastes a new food and takes it out or spits it out (Child's Key)*
- *Child refuses to eat what is served (Child's Key)*
- *Child has a tantrum when he or she doesn't get what is desired (Consider using timeout one minute per year of age)*
- *Child doesn't eat enough (Child's Key)*
- *Child likes a food one day and not the next (Child's Key)*
- *Child will only eat favorite foods (Keep serving a variety of foods)*
- *What else?*

*Shall we talk about any of these and how to use the model? Do you have situations of your own you would like us to work on?*

**ASSIGN HOMEWORK.** Fill out the Feeding Your Child Questionnaire (See Appendix) to help identify what parents would like to change about their family feeding practices.

## SESSION-BY-SESSION: SESSION TWO

The aim of the second session is to continue to describe and elaborate the 5-Keys model. Describe pieces of the model that were not dealt with in the first session. Introduce behavior change procedures applicable to problems such as tantrums over food, getting up and down from the table, etc. In this session, there is more clarification of the key concepts and procedures and discussion is fostered throughout. The expectation is that parents will apply the behavior change to all children in family.

Begin the session by asking how everyone is doing and then begin a discussion about what they are doing well and what needs to change.

Then continue to describe details of the 5-Keys that were not taught in Session 1. It may also be useful to give the Time Out Handout (Appendix) if handling difficult behaviors is brought up. See last page of this session for the handout.

*Problems arise when parents get involved with the child's responsibilities and when parents let children take over parent responsibilities. Problem solving begins by breaking down the problem to identify where the division of responsibility/5-Keys has been broken. When feeding problems occur, they can always be traced back to either the parents handing off their responsibilities to the child, or the parent taking over the child's responsibilities. We will help you learn how to problem solve by always going back to the 5 Keys and where they have been broken.*

*In order to know what an eating problem is, we need to know what normal eating is.*

### ***Normal child eating behaviors:***

- **The Toddler:**
  - **Is suspicious of new food**
  - **Slows growth rate and isn't as hungry**
  - **Prefers to play than to take time for meals**
  - **Rejects even familiar food**
  - **Will manipulate adults with eating**
- **What is normal eating?**
  - **Eating inconsistently – some days more, some days less**
  - **Liking a food one day and not the next**
  - **Tasting a new food and spitting it out**
  - **Being interested in *what* the adult eats and *does* at the table**
  - **Being picky about what to eat**

*What do you think? Is this normal eating? Have you been worried about these?*

Facilitate group discussion. Then continue with a delineation of some parent problems arising from difficulty in following the 5-keys.

*Parents who struggle with WHAT:*

- **Short order cook**
- **Are stressed over what their child eats**
- **Remind the child what he or she doesn't like (labeled as a broccoli hater)**
- **Neglect the child's nutritional needs**
- **Have an agenda regarding food**
- **Are motivated by fear**

*Parents who struggle with WHEN:*

- **May be fearful of feelings of hunger in themselves and/or child**
- **Cave into child's begging in between meals or snacks**
- **Pacify child with food or beverage**
- **Undermine the family mealtime**

*Any thoughts about all this? How difficult is it for you to set limits? What happens when you try to set limits?*

Facilitate group discussion.

*Let's look at the parent's tasks again so that we are clear about them.*

*Parents' tasks are to:*

- **Choose and prepare food (what)**
- **Have regular meals and snacks (when)**
- **Turn off the TV at meal and snack times (where)**
- **Not let the child graze for food or beverages between times (where)**
- **Make eating time pleasant (where)**
- **Expect the child to learn (mastery expectation)**
- **Accept the child's need for autonomy (child's responsibility)**

This should lead to a further discussion of problems and solutions.

**ASSIGN HOMEWORK.** Ask parents to identify a behavior they would like to change. Have them monitor this behavior at each meal (See Appendix for monitoring record) for the next week.

### STEP-BY-STEP: SESSION THREE

Begin this session with a discussion of monitoring records. In this and the final two sessions, discussion time should be the predominant activity. When the discussion is concluded with every parent having had a turn, continue with the material below.

*The division of responsibility depends on trust. It means the following:*

- *No portion sizes*
- *No serving numbers*
- *No limiting fat percentage to 30%*
- *No urging fruits, vegetables, whole grains*
- *No insisting on a clean plate before dessert*
- *No “take a bite for me” bites*

*Remember that it is the child’s responsibility to regulate his or her eating. How do you feel about trusting children to eat when you don’t do the above? How long will it take for a child to adopt a new behavior?*

- *Toddler: 2 to 3 weeks*
- *Preschooler: 5 to 6 weeks*
- *School aged: 1 to 2 months*

*For the next week, let’s each choose a behavior to change. Sometimes, when parents change their rules, the problem can get worse before it gets better. Children will test you to see if you really mean what you say, and if you will stick with it. This is normal, and don’t let it discourage you. Can you think of some examples of how your child may test you with the behavior change you have chosen?*

**ASSIGN HOMEWORK.** Have parents choose a behavior to change and help them formulate a behavior change plan. Engage other parents in planning.

## STEP-BY-STEP: SESSION FOUR

The main focus of Sessions 4 and 5 is on group discussion of progress in changing behaviors affecting eating. It is important in Session 4 to review progress and problems in instituting the 5-Keys. This might begin with a review of the elements of the 5-Keys and how to problem solve using the 5-Keys to identify the root of the problem, and then to review with parents each element and how they have been doing with putting them into action.

RE-DISTRIBUTE 5-KEYS HANDOUT.

### *Parents' Responsibilities:*

- What food is served?
  - Purchase and prepare the food that will promote good health.
  - Serve a variety of foods.
  - Offer your child the same food as the rest of the family, not just foods you know he or she will eat. No short-order cooking!
  - Remember that a meal should consist of: low fat milk or protein, vegetables, fruit, carbohydrates, and fat of some sort (butter, salad dressing, margarine, etc.).
- When is food served?
  - Have structured meals and snacks
  - Establish a daily eating routine
  - As much as possible, have your child eat at the same time every day, and/or same time as the rest of the family.
  - Limit caloric beverages, including juice, between meal times.
  - Be consistent when establishing meal and snack times (don't wait for them to ask nor feed if out of time schedule, children should not be allowed free access to the refrigerator, snacks, etc. i.e. the parent is in control of when to eat)
- Where is food served?
  - Meal time is family time
  - TV off, no distractions
  - Not while walking, running, or playing
  - Not while being chased with a spoonful of food
  - Make eating times pleasant

*To what extent have these elements been put into practice? Are there any issues we need to problem solve?*

### *Children's Responsibilities:*

- How much to eat?

- Children are born knowing how much to eat
- Children will eat a lot some days and very little other days
- Children should not be forced to clean their plate or forced to eat even an extra bite
  
- Whether to eat or not
  - Don't force your children to eat a food they hate, but continue to serve or offer it at meals
  - Do expect that your children will learn to like that food some day especially if they see you eating it
  - If you do your responsibilities, you can trust your child to eat

*To what extent have these elements been put into practice? Are there any issues we need to problem solve?*

*Remember: Problem solving begins by breaking down the problem to identify where the division of responsibility/5-Keys has been broken. When feeding problems occur, they can always be traced back to either parents handing off their responsibilities to children, or parents taking over their children's responsibilities. We will help you learn how to problem solve by always going back to the 5-Keys and where they have been broken.*

**ASSIGN HOMEWORK.** Finish the session with a discussion of the progress and problems that the parent is working on and group problem solving. Remind parents again that learning the 5-Keys is a process, and that when all 5-Keys are implemented feeding goes best. Make sure that each parent has something to work on in the next week.

### STEP-BY-STEP: SESSION FIVE

Note to the group that this is the last session. As usual begin the session with a discussion of successes and problems in changing behavior. Lead the discussion toward the issue of maintenance of behaviors and confidence in continuing to change any residual problems instituting the 5-Keys.

*Now that you've made some changes to your family meals, how do you feel about maintaining these changes? What will you do to maintain the changes?*

If there is remaining time, ask for feedback regarding the series.

*I'd like to ask for some feedback regarding our program. What was helpful? What can we do to improve our program?*

**At the end of the session, remember to thank parents for participating in the program.**

## References

1. Satter, E. M. (2007) The Satter Feeding Dynamics Model of child overweight definition, prevention and intervention. In W. O'Donahue, B. A. Moore, & B. Scott (Eds.), *Pediatric and Adolescent Obesity Treatment: A Comprehensive Handbook*. New York: Taylor and Francis.
2. Satter, E. M. (1986). The feeding relationship. *Journal of the American Dietetic Association*, 86, 352-356.
3. Agras, W. S., Hammer, L. D., McNicholas, F., & Kraemer, H.C. (2004). Risk factors for childhood overweight: A prospective study from birth to 9.5 years. *Journal of Pediatrics*, 145, 20-25.



## Appendix C

### Child Feeding Questionnaire

**Please rate the following statements on a scale from 1-5.**

1. How concerned are you about your child eating too much when you are not around?

1            2            3            4            5  
Never   Seldom   Half of the time   Most of the time   Always

2. How concerned are you about your child having to diet to maintain a desirable weight?

1            2            3            4            5  
Never   Seldom   Half of the time   Most of the time   Always

3. How concerned are you about your child becoming over weight?

1            2            3            4            5  
Never   Seldom   Half of the time   Most of the time   Always

4. I have to be sure that my child does not eat too many sweets (candy, ice cream, cake or pastries).

1            2            3            4            5  
Never   Seldom   Half of the time   Most of the time   Always

5. I have to be sure that my child does not eat too many high-fat foods.

1            2            3            4            5  
Never   Seldom   Half of the time   Most of the time   Always

6. I have to be sure that my child does not eat too much of her favorite foods.

1            2            3            4            5  
Never   Seldom   Half of the time   Most of the time   Always

7. I intentionally keep some foods out of my child's reach.

1            2            3            4            5  
Never   Seldom   Half of the time   Most of the time   Always

8. I offer sweets (candy, ice cream, cake, pastries) to my child as a reward for good behavior.

1            2            3            4            5  
 Never   Seldom   Half of the time   Most of the time   Always

9. I offer my child her favorite foods in exchange for good behavior.

1            2            3            4            5  
 Never   Seldom   Half of the time   Most of the time   Always

10. If I did not guide or regulate my child's eating, she would eat too many junk foods.

1            2            3            4            5  
 Never   Seldom   Half of the time   Most of the time   Always

11. If I did not guide or regulate my child's eating, she would eat too much of her favorite foods.

1            2            3            4            5  
 Never   Seldom   Half of the time   Most of the time   Always

12. My child should always eat all of the food on her plate.

1            2            3            4            5  
 Never   Seldom   Half of the time   Most of the time   Always

13. I have to be especially careful to make sure my child eats enough.

1            2            3            4            5  
 Never   Seldom   Half of the time   Most of the time   Always

14. If my child says "I'm not hungry", I try to get her to eat anyway.

1            2            3            4            5  
 Never   Seldom   Half of the time   Most of the time   Always

15. If I did not guide or regulate my child's eating, she would eat much less than she should.

1            2            3            4            5  
 Never   Seldom   Half of the time   Most of the time   Always

### Client Satisfaction Questionnaire

**Please help us improve our program by answering some questions about the services you received. We are interested in your honest opinion, whether they are positive or negative. Please answer all the questions. We also welcome your comments and suggestions. Thank you very much; we appreciate your help.**

1. How would you rate the quality of the service you received?  
 Excellent  
 Good  
 Fair  
 Poor
  
2. Did you get the kind of service you wanted?  
 Definitely not  
 Not really  
 Yes, generally  
 Yes, definitely
  
3. To what extent has our program met your needs?  
 Almost all of my needs met  
 Most of my needs met  
 Only a few of my needs met  
 All of my needs met
  
4. If a friend were in need of similar help, would you recommend our program to him or her?  
 Definitely not  
 Not really  
 Yes, generally  
 Yes, definitely
  
5. How satisfied are you with the amount of help you have received?  
 Quite dissatisfied  
 Mildly dissatisfied  
 Mostly satisfied  
 Very satisfied
  
6. Have the services you received helped you to deal more effectively with your problems?  
 Helped a great deal  
 Helped somewhat  
 Did not really help  
 No, they seemed to make things worse
  
7. In an overall, general sense, how satisfied are you with the service you have

received?

- Very satisfied
- Mostly satisfied
- Mildly satisfied
- Quite dissatisfied

8. If you were to seek help again, would you come back to our program?

- Definitely not
- No, not really
- Yes, generally
- Definitely

9. Additional comments or suggestions:

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